

WITHYPOOL HILL, WITHYPOOL, EXMOOR NATIONAL PARK

(NGR SS 8392 3439)

Results of Archaeological Desk-based Assessment,
Measured and Photographic Survey of Withypool Stone
Circle, and Geophysical Survey

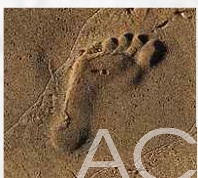
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On behalf of:
Exmoor National Park Authority

Report No: ACD1536/2/1

Date: February 2018



archaeology

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The views and recommendations expressed in this report are those of AC archaeology and Substrata are presented in good faith on the basis of professional judgement and on information currently available.

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Photographic record
Digital survey data

Summary

This report sets out the results of archaeological surveys undertaken at Withypool Hill, Withypool, Exmoor National Park, Somerset (centred on NGR SS 8392 3439), carried out by AC archaeology in partnership with Substrata in January and February 2017. The surveys were commissioned by the Exmoor National Park Authority (ENPA), and funded by Historic England to investigate the archaeology of Withypool Hill, in particular the two Scheduled Monuments of Withypool Stone Circle and a bowl barrow. The results of the surveys will be used to inform future management and prevent further damage, both to the archaeological sites and any buried features associated with them.

1. INTRODUCTION (Figs 1-2)

- 1.1 This report sets out the results of archaeological surveys undertaken at Withypool Hill, Withypool, Exmoor National Park, Somerset (centred on NGR SS 8392 3439), carried out by AC archaeology in partnership with Substrata in January and February 2017. The surveys were commissioned by the Exmoor National Park Authority (ENPA), and funded by Historic England to investigate the archaeology of Withypool Hill, in particular the two Scheduled Monuments of Withypool Stone Circle and a bowl barrow. The work was carried out in accordance with briefs provided by the ENPA (Blaylock 2016a; 2016b) and a method statement produced by AC archaeology (Passmore 2017).
- 1.2 The investigations comprised an archaeological desk-based assessment and walkover survey of Withypool Hill, a measured and photographic survey of the Withypool Stone Circle, and geophysical surveys of the Withypool Stone Circle and a bowl barrow and round cairn on the summit of Withypool Hill.
- 1.3 The overall survey area covers approximately 146ha located on the eastern side of Withypool Common, centred on Withypool Hill and the unenclosed land to the north, east, south and west. Detailed survey areas (for the geophysical survey) covered 3ha centred on Withypool Stone Circle and the bowl barrow and round cairn. The summit of Withypool Hill is at a height of 398m aOD, with land sloping gently down in a southerly direction to 341m aOD, and more steeply to the north down to 270m aOD. It also slopes down to the east to Worth Lane that bounds the eastern side of the moorland, and to the west to a col above the head of the Portford Water, a stream that flows into Knighton Combe. The underlying solid geology comprises Devonian sandstone of the Po Downs Sandstones Formation with bands of Devonian slate of the Morte Slates Formation.

2. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

Archaeological background

- 2.1 The ENPA Historic Environment Record (HER) contains entries for a number of heritage assets that are recorded on Withypool Hill:
 - MMO3189 – Possible World War Two training site at Withypool Hill,
 - MMO3190 – Possible World War Two military training site on Withypool Hill,
 - MMO3191 – Possible World War Two military training site on Withypool Hill,
 - MMO3192 – Possible World War Two military earthwork on Withypool Hill,

- MMO3193 – World War Two features near West Water Combe,
- MSO8682 – Withypool Stone Circle, Withypool Hill. This asset is designated as a Scheduled Monument (National Heritage List no. 1021261),
- MSO8683 – Bronze Age bowl barrow on Withypool Hill. This asset is designated as a Scheduled Monument (National Heritage List no. 1021262),
- MSO8739 – Alleged prehistoric hut circles on Withypool Hill,
- MSO8742 – Possible Bronze Age barrow on Withypool Hill,
- MSO8752 – Medieval or post-medieval field system on Withypool Hill,
- MSO8756 – Prehistoric cairn on Withypool Hill. This asset forms part of the Scheduled Monument (National Heritage List no. 1021262) with MSO8683, and
- MSO12359 – Medieval or post-medieval clearance mounds on Worth Hill.

2.2 The brief also contained details of an additional asset – MMO3200 (Post-medieval field boundary at Tudball Platts) – that is located outside the survey area. This is visible on inspected LiDAR data, along with a former boundary within the field to the west, but is not recorded on 19th- and early 20th-century Ordnance Survey maps. It was not visited as part of the fieldwork.

2.3 The barrow on the summit of Withypool Hill (MSO8683) was known during the 19th century, and was recorded on the first edition Ordnance Survey 25-inch map. The stone circle (MSO8682) was identified in 1898 (Riley and Wilson-North 2001, 24), and was archaeologically first recorded in 1906 by Harold St George Gray who also noted possible hut circles on the hill (MSO8739). The stone circle, barrow and another cairn (MSO8756), which are also scheduled have been subject to archaeological surveys since the 1960s.

2.4 All other assets have been recorded from aerial photographs, and other than the hut circles (MSO8739), a possible barrow (MSO8742), and clearance mounds (MSO12359) none have been investigated on the ground to assess their presence/absence or condition.

Historical background

2.5 No detailed historical research has been undertaken as part of the current survey. However, probably in the later 18th century there is a reference to part of Withypool Common having "recently been tilled and there are signs that several other parts now laid down [to pasture] have been anciently tilled" (quoted in Hegarty 2014, 82). This reference would tie in nicely with the aerial photographs evidence for former field systems (MSO8752). A comparison can be made with the unenclosed moorland at Crownhill Down on southwest Dartmoor where relict historic field systems, beyond the current boundary of the enclosed land, date from after c. AD1650 (Andrew Passmore *pers. comm.*). There are 19th-century records for attempts at enclosure of Withypool Common, but most were rejected (Hegarty 2014, 97), which is apparent in the field evidence where few high-altitude fields are present. A notable exception are the four small fields adjacent to the southwest corner of the survey area where asset MMO3200 is located (within the four fields 330-333 on the first edition Ordnance Survey 25-inch map).

2.6 The Withypool tithe map of 1839 labels Withypool Hill as part of the wider Withypool Common. The only feature depicted within the survey area is an unfenced trackway passing roughly east-west along the southern slopes of the hill (see section 5.19 below). The first and second edition Ordnance Survey 25-inch maps of 1889 and

1904 also record the unenclosed nature of the common, and depict the barrow on the top of the hill. Historic Ordnance Survey maps also show a number of quarries and gravel pits, a guide post and bench marks (presumably, given the landscape, inscribed onto upright stones) along the roads on the northwest and east sides of the hill. None of these are recorded on the HER, but all are described in section 5 below.

3. AIMS

3.1 The aims of the investigations were set out in briefs provided by the Exmoor National Park Authority Conservation Officer (Historic Environment) (Blaylock 2016a; 2016b). The overall aim of the desk-based assessment and measured and photographic survey of the stone circle was to "clarify the nature and extent of any archaeological features present so that they can be taken into account during future management of the hill, especially in relation to paths and tracks". More specific objectives were:

1. To examine the available sources to present an up to date assessment of the archaeological landscape on Withypool Hill and a detailed record of the stone circle,
2. To identify the extent, character, significance and likely date of archaeological features on Withypool Hill from these desktop sources (including LiDAR and available aerial photographs) and a rapid walkover survey,
3. To make a detailed measured and photographic record of Withypool Stone Circle at an appropriate scale, including a record of each stone. This should be sufficiently detailed to inform future conservation works, and should include the extent of the current path and erosion damage caused,
4. To compare the current survey of the stone circle with the results of previous surveys and assess change, and
5. To provide information on the historic environment to inform future management of Withypool Hill.

3.2 The aims of the geophysical surveys were:

1. To identify any below-ground structural components of the stone circle and barrows (such as ditches, pits, burning activity, cists, walling, etc.),
2. To ascertain the presence/absence of an encircling ditch or kerb to the barrow and cairn,
3. To identify any adjacent archaeological features,
4. knowledge of surveying sites of this type from previous geophysical survey work carried out at the Chapman Barrows and Porlock Stone Circle, and
5. To use a range of modern remote sensing techniques including gradiometry, earth resistance and GPR.

4. METHODOLOGY

4.1 All investigations were carried out in accordance with this project design and the Exmoor National Park Authority's *The Conduct of Archaeological Work & Historic Building Recording Within Exmoor National Park*. All staff complied with the *Code of Conduct* of the Chartered Institute for Archaeologists and the relevant standards, and the relevant Historic England guidance.

Desk-based assessment and field survey

4.2 The desk-based assessment comprised the collation of data from the following sources:

- HER data held by the ENPA,
- Open-access Environment Agency LiDAR data,
- Aerial photographs held by the ENPA and/or the Somerset Heritage Centre,
- Published material (e.g. Riley and Wilson-North 2001; Hegarty 2014) held by AC archaeology, the Somerset Heritage Centre or other repositories.

4.3 During the field survey all recorded heritage assets and any new heritage assets identified during the desk-based assessment were visited. Site records were compiled on pro forma sheets completed for each asset. For known assets existing descriptions were updated as necessary, and for newly-identified assets a full description was prepared. For all assets their current condition was recorded, and any existing or potential threats identified. The locations of newly-identified assets were plotted by GPS. A digital photographic record was compiled.

Measured and photographic survey of Withypool Stone Circle

4.4 A survey of the Withypool Stone Circle was undertaken using a Leica Net rover GPS, with 1-2cm accuracy. The survey was accompanied by a written description of the stone circle using the pro forma recording sheets outlined in section 4.3 above. This was accompanied by a digital photographic record to illustrate the setting of the stone circle, each individual stone, along with areas of erosion.

Geophysical survey by Ross Dean

4.5 The survey comprised magnetometer and earth resistance surveys and the detailed methodologies are presented in Appendix 1.

GPR survey

4.6 A planned ground penetrating radar (GPR) survey across the barrow and cairn was abandoned after inspecting the ground conditions. The barrow had a disturbed and stony summit and boggy ground to the north which precluded a good ground contact for the radar equipment. Similar conditions were found on the cairn.

5. THE ARCHAEOLOGY OF WITYPOOL HILL

Introduction

5.1 This section of the report describes the known archaeology of the Withypool Hill, set out in chronological order. Previously-recorded assets are identified through their HER number, with newly identified assets given "AC" numbers. For each asset a brief description summarised from the HER entry is presented, followed by notes from the current survey including a new description, condition and management issues where applicable. The location of all the heritage assets described below is presented in Fig. 2.

Prehistoric (Neolithic – Bronze Age)

MSO8682 – Withypool Stone Circle, Withypool Hill

5.2 A stone circle on the upper southwest slope of Withypool Hill. It is only one of two stone circles recorded within Exmoor National Park, and is designated as a Scheduled Monument (National Heritage List no. 1021261). The stone circle was first recorded in 1906 by St George Grey when 37 stones were plotted; it is alleged that originally it could have contained 100 stones. The asset has been the subject of topographic and conditions surveys from the 1960s onwards: in 1969 and 1978 29 stones were recorded but this had dropped to 27 in 1989.

5.3 The 2017 topographic survey is presented as Fig. 3, and comparisons with earlier surveys are shown in Fig. 4. Table 1 below sets out descriptions of individual stones recorded during the current survey.

Stone no.	Plate no.	Description	Comments
1	2	<i>In situ</i> sub-rectangular stone measuring 210mm by 110mm by 120mm high	Stone is obscured by vegetation
2	3	Large <i>in situ</i> sub-angular stone measuring 630mm by 310mm by 520mm high	Stone is leaning out of the stone circle indicating damage to socket (as recorded by adjacent hollowing within the stone circle)
2A	-	Not located during survey	Recorded in 1989. The stone has either been removed or is obscured by vegetation
3	4	<i>In situ</i> small sub-rectangular stone measuring 350mm by 230mm by 40mm high	Not recorded in 1989. The stone is almost completely obscured by vegetation, and only the very top is visible
4	5	<i>In situ</i> very small stone measuring 110mm by 30mm wide	Not recorded in 1989. The stone is almost completely obscured by vegetation, and only the very top is visible
5	6	<i>In situ</i> Stone shattered into three pieces, measuring overall 230mm by 160mm by up to 70mm high	Stone visible on the surface of the track around the stone circle
6	7	<i>In situ</i> sub-triangular stone measuring 280mm by 110mm by 140mm high	Stone largely obscured by vegetation but visible due to the track around the stone circle
7	8	<i>In situ</i> angular stone measuring 260mm by 190mm by 200mm high	Stone visible in the track around the stone circle, and is leaning slightly towards the centre of the circle
8	9	<i>In situ</i> sub-angular stone measuring 310mm by 100mm by 100mm high	Stone largely obscured by vegetation but visible due to the track around the stone circle. It is leaning slightly towards the centre of the circle
9	10	<i>In situ</i> sub-rectangular stone measuring 550mm by 110mm wide	Stone largely obscured by vegetation but visible on the surface of the track around the stone circle
10	11	Fractured <i>in situ</i> stone, probably originally sub-rounded or sub-rectangular, measuring overall 260mm by 150mm by 110mm high	

Stone no.	Plate no.	Description	Comments
11	12	Large sub-angular <i>in situ</i> stone measuring 520mm by 230mm by 540mm high. It stands within the centre of an erosion hollow averaging 880mm in diameter	Located on edge of the track passing through the stone circle. The stone is very similar to stone 2 (in size and the presence of a hollow). It is possible that these hollows represent an attempt to or evidence for re-erection of the stones
12	13	Fractured <i>in situ</i> stone measuring 239mm by 110mm by 130mm high	Stone largely obscured by vegetation but visible within the track around the stone circle. It is possible that the damage has been caused by visitors
13	-	Not located during survey, but in its location is a 170mm diameter slight hollow	Not recorded in 1989. The hollow is located within the track around the stone circle
14	14	Small <i>in situ</i> sub-rounded stone measuring 170mm by 150mm by 120mm high	It is located within the track around the stone circle, and is slightly leaning outwards away from the stone circle
15	15	Small <i>in situ</i> stone measuring 300mm by 90mm by 160mm deep	Stone is obscured by vegetation but visible on the outside of the track around the stone circle
16	-	Not located during survey	Not recorded in 1989
17	-	Not located during survey	Not recorded in 1989
18	16	Medium-sized <i>in situ</i> stone measuring 340mm by 160mm by 180mm high	It leans slightly towards the centre of the stone circle, which may be caused by an old fracture
19	17	Very small <i>in situ</i> stone measuring 100mm by 25mm by 30mm high	Stone almost entirely obscured by vegetation but the tip is visible within the track around the stone circle
20	18	Small <i>in situ</i> sub-rounded stone measuring 200mm by 130mm by 100mm high	
20A	-	Not located during survey	Recorded in 1989
21	19	Large <i>in situ</i> sub-rectangular stone measuring 430mm by 70mm by 10mm high	Stone almost entirely obscured by vegetation but the tip is visible
22	20	<i>In situ</i> sub-triangular stone measuring 220mm by 130mm by 190mm high	Stone largely obscured by vegetation
23	21	Triangular stone measuring 300mm by 190mm by 90mm high. A nearby hollow measuring 510mm by 220mm by 380mm deep may be the feature recorded in 1989	Hollow only recorded here in 1989. Erosion seems to have taken place since 1989 exposing the top of the stone
24	22	Large sub-rounded <i>in situ</i> stone measuring 510mm by 220mm by 380mm high	A slight adjacent hollow may represent modern erosion since it is present within the track around the stone circle
25	-	Not located during survey	Not recorded in 1989. Its position is within the track around the stone circle

Stone no.	Plate no.	Description	Comments
26	-	Not located during survey	Recorded in 1989. Its position is within the track around the stone circle. Some very small stone fragments are present here but none are <i>in situ</i>
27	23	<i>In situ</i> sub-triangular stone measuring 360mm by 260mm by 2100 high	It is angled (rather than leaning) that may be a natural movement rather than deliberate or caused by erosion
28	24	<i>In situ</i> sub-triangular stone measuring 230mm by 140mm by 240mm deep	Base obscured by vegetation. It has a slight lean toward the centre of the stone circle but appears solid. There is a fracture in the centre of the stone
29	25	Large <i>in situ</i> irregularly-shaped stone measuring 430mm by 170mm by 250mm high	Base obscured by vegetation.
30	26	Large <i>in situ</i> sub-rectangular stone measuring 650mm by 450mm by 350mm high with an erosion hollow on its northeast side	Base obscured by vegetation. Despite the erosion hollow the stone appears stable and <i>in situ</i>
31	-	Not located during survey	Recorded in 1989. Located in track running through the stone circle so possibly eroded away. Some small stone visible nearby but not <i>in situ</i> and cannot be conclusively associated with this stone
31A	-	Not located during survey	Not recorded in 1989. Positioned in track running through the stone circle so possibly eroded away. Some small stone visible nearby but not <i>in situ</i> and cannot be conclusively associated with this stone
32	27	Small <i>in situ</i> irregularly-shaped stone measuring 230mm by 80mm by 80mm high	Base obscured by vegetation. Stone is leaning outwards away from the centre of the stone circle. The top is fractured
33	-	Not located during survey	Not recorded in 1989.
34	28	Large <i>in situ</i> sub-rectangular stone measuring 500mm by 310mm by 250mm high	Base obscured by vegetation, which is also beginning to engulf the whole stone. Stone is leaning outwards away from the centre of the stone circle.
35	29	<i>In situ</i> sub-triangular stone measuring 280mm by 120mm by 100mm high	Base obscured by vegetation, which is also beginning to engulf the whole stone.
36	30	Small <i>in situ</i> stone measuring 280mm by 90mm by 120mm high	Base obscured by vegetation, which is also beginning to engulf the whole stone. A crack runs through the stone
37	31	<i>In situ</i> stone measuring 240mm by 30mm by 20mm high	Almost entirely obscured by vegetation with only the tip visible.

Table 1: Descriptions of stones recorded during the 2017 survey

- 5.4** The 2017 survey identified 30 *in situ* stones forming part of the circle, compared to 27 in 1989 and 29 in 1969 and 1978. Stones not recorded in 1989 had been previously identified and had been exposed in a circular track running around the stone circle, indicating that use of the track is causing erosion to the ground surface with formerly buried stones becoming visible. Conversely, some of the stones recorded in 1989 and not identified in 2017 appear to have been lost as a result of erosion along the route of this track. This track averages 610mm wide and has been created by people walking around the stone circle.
- 5.5** The principle track running through the stone circle on a broadly east-west alignment measures up to 6.85m wide, and has extensive rutting along the centre (Plate 32). Historically, the creation of this track may have been responsible for the loss of stones (between 10 and 11, and 31a-32) but there is no evidence that new damage is being caused to the visible upright stones. A modern cairn has been created adjacent to the track in the centre of the stone circle (Plate 33). It is formed from small stones possibly derived from the track (i.e. naturally eroding stone) or from another source, the stone circle itself or from the quarry car park immediately west of the survey area, southwest of Portford Bridge.
- 5.6** Several animal tracks were recorded passing through the stone circle. These were not causing any damage and there is no evidence that the grazing animals were using the monoliths as rubbing stones. Most are generally too small for such a use.

MSO8683 – Bronze Age bowl barrow on Withypool Hill (Plate 34)

- 5.7** A bowl barrow on the top of Withypool Hill, which is designated as a Scheduled Monument (National Heritage List no. 1021262). A 1995 survey provides the following description:

It is 20.5 metres in diameter and 0.9 metres high. Its summit has been disturbed by robbing and possible excavation: it is now covered by amorphous hollows. A modern cairn has been built on the eastern inside of the summit. The southern part of the mound has a break in slope suggesting that material from the robbing hollows has been dumped on the slope. "Quarry" ditches around the eastern and northern sides of the barrow appear to be recent and either represent robbing or an attempt to locate a presumed kerb around the monument. Despite the interference to the monument, no excavation is documented.

- 5.8** Additional interpretations for the damage include removal of material for post-medieval field boundaries and disturbance during World War Two.
- 5.9** The barrow and its condition as recorded in 2017 correlates strongly with the 1995 description. Damage is more extensive around the southern side, and there appears to be some phasing to the excavations. The north excavation appears to cut through the central excavation, perhaps indicating that the latter was an antiquarian excavation. The largest eastern hollow also cuts through the more extensive excavation around the southern edge of the barrow. The modern cairn on the top is still present, and material seems to be being brought up the hill to the cairn (perhaps from the quarry car park immediately west of the survey area, southwest of Portford Bridge), rather than being derived from the barrow itself. The flat areas are generally free of dense vegetation, but gorse and tall grasses are present on the scarps and within the excavation hollows.

MSO8756 – Prehistoric cairn on Withypool Hill (Plate 35)

- 5.10 A cairn recorded as a 3.5m diameter by 0.30m high turf-covered stony mound, just below the summit of Withypool Hill. It forms part of the Scheduled Monument (National Heritage List no. 1021262) with MSO8683.
- 5.11 It was recorded in 2017 as a sub-circular feature measuring 3.8m long (E-W) by 3.6m wide (N-S) by 0.5m high, partially covered in grass and moss obscuring the exact edges. No damage to the cairn was recorded.

MSO8742 – Possible Bronze Age barrow on Withypool Hill

- 5.12 A possible barrow recorded as a "cropmark" on 1946 aerial photographs comprising a 10m diameter levelled area with encircling ditch of about 2m width. The feature has not been identified on the ground during subsequent field visits.
- 5.13 The feature was not identified during the 2017 field survey.

MSO8739 – Alleged prehistoric hut circles on Withypool Hill

- 5.14 Hut circles recorded by St George Gray in 1905. No trace of these have subsequently been identified either from inspection of aerial photographs or field visits. Earthwork features associated with World War Two training activity have been noted in the vicinity, and appear to have been levelled after the war.
- 5.15 The features were not identified during the 2017 field survey.

MEDIEVAL AND POST-MEDIEVAL

MSO8752 – Medieval or post-medieval field system on Withypool Hill

- 5.16 Banks identified from aerial photographs, forming rectangular enclosures on the lower slopes of Withypool Hill, some containing areas of ridge and furrow ploughing, including an old trackway running through (and apparently cutting through) the southern group of fields.
- 5.17 The aerial photographic transcription shows two groups of relict fields located on the north as well as the south and east sides of the hill; these have been identified as the NW and SW field systems respectively during the 2017 field survey.

NW field system

- 5.18 Analysis of the aerial photographic transcription indicates that this field system comprises a northern group of earlier fields, with a subsequent group of fields constructed to the southwest of these. A bridleway passes through the northern group of fields and is deeply rutted. At the west end of the field system (east of the road), the bridleway cuts through the bank forming the western boundary of the first field. Along the bridleway a series of seven machine-excavated drains have been dug to disperse water away from the track. One of these drains cuts through the bank forming the eastern boundary of the first field east of the road. A further drain cuts through the eastern boundary of the southeast field. This drain terminates in a depression measuring 10m by 12m long. This may be a quarry (Plate 36).

SE field system (Plate 37)

- 5.19 Within this field system there is an old, east-west aligned, trackway (recorded on the tithe map), still utilised as a track along with another track that starts at the southeast corner of the down and converges with the older track and continues westwards

toward other tracks and the road. Four principal areas of damage have been identified. The first is where the two tracks converge, and the presence of the banks has created a choke point where there is heavy erosion (Plate 38). Here two of the banks have been breached by the tracks. In this general area there is also additional (lesser) damage to the banks being caused by the natural movement of grazing animals. To the southeast the modern track cuts through the southern bank of the old trackway. The bank has been completely eroded here, and the adjacent lengths of bank are also damaged. Further to the southeast several vehicle and animal tracks cross a north-south aligned boundary. At these locations the bank has been completely eroded away and the associated drainage ditch largely filled in. The gorse in this area has been removed with a machine, and in some places this has caused some damage to the banks. The final area of damage is at the southeast end of the track where it passes over a north-south aligned bank. The bank is in a poor condition but still survives as an earthwork under the track. Here a drainage ditch has been dug using a machine fitted with a toothed bucket.

MSO12359 – Medieval or post-medieval clearance mounds on Worth Hill

5.20 A group of mounds measuring up to 2m diameter by 0.6m high representing late medieval or post-medieval clearance cairns associated with agricultural improvement. Only the extreme northwest corner of the mapped extent of these features falls within the survey area.

5.21 No mounds were identified within the survey area.

AC001 – Quarry (Plate 39)

5.22 A quarry depicted as "Old Quarry" on the first edition Ordnance Survey 25-inch map, and also visible on LiDAR data. It is located on the west side of Worth Lane at SS 84571 34313. It is accessed from the road and is dug westwards into the hillside. It comprises a short 6m long southern spur and a principal northern excavation curving 32m long by 3m deep. No threats to the asset were noted.

AC002 – Quarry (Plate 40)

5.23 A narrow, linear quarry visible on LiDAR data, but not recorded on any large-scale Ordnance Survey map. It is located on the west side of Worth Lane at SS 84582 34277. It is accessed from the road and is dug westwards into the hillside for a distance of 12m. It is completely overgrown with gorse, and a water erosion channel has developed at its west end.

AC003 - Quarry (Plate 41)

5.24 A quarry depicted as "Old Quarry" on the first edition Ordnance Survey 25-inch map, and also visible on LiDAR data. It is located on the west side of Worth Lane at SS 84585 34250. It appears to have been broadly linear measuring 19m long by up to 5m wide. However when overhead cables were installed a ramp onto the moor from the road was created through the east and southeast part of the feature removing evidence of its form.

AC004 - Quarry

5.25 A quarry first depicted on the second edition Ordnance Survey 25-inch map on the west side of Worth Lane at SS 84480 34973, and also visible on LiDAR data. The area is covered in dense gorse and the quarry was not located during the 2017 field survey.

AC005 – Quarry (Plate 42)

- 5.26 A quarry depicted on the first edition Ordnance Survey 25-inch map as a "Gravel Pit" on the south side of the road at SS 83188 34410, south of Portford Bridge. It had been extended when the second edition 25-inch revision of 1904 was produced; it is recorded on later Ordnance Survey maps and is visible on LiDAR data. It measures 16m long by 11m wide by 3-4m deep. The feature is completely overgrown, but, despite the close proximity of a well-used track to the summit of Withypool Hill there is no other damage or erosion, and it has stable sides. Two other quarries are present adjacent to the road to the west, but these are located outside the survey area.

AC006 – Guide Post

- 5.27 A guide post depicted on the first edition Ordnance Survey 25-inch map with a bench mark. The bench mark only was recorded on the second edition Ordnance Survey 25-inch map. It was located on the east side of the road at its junction with the present bridleway and another track to the west of and outside the survey area (at approximately SS 83600 34783). The guide post was not identified *in situ*, but a fallen stone was noted at this location. Due to the divergence of the bridleway and the road there is extensive erosion at this location (Plate 43).

AC007 – Bench Mark

- 5.28 A bench mark depicted on Ordnance Survey 25-inch maps in various positions adjacent to Worth Lane (at approximately SS 84470 34994). The highway is cut into the hill with a steep bank on its west side, which along with the moorland above is covered in dense gorse. A stone inscribed with the bench mark was not identified during the 2017 field survey.

AC008 – Bench Mark

- 5.29 A bench mark depicted on Ordnance Survey 25-inch maps on the west side of Worth Lane (at approximately SS 84563 34855). The highway is cut into the hill with a steep bank on its west side, which along with the moorland above is covered in dense gorse. A stone inscribed with the bench mark was not identified during the 2017 field survey.

Modern (20th century)

MMO3189 – Possible World War Two training site at Withypool Hill (Plate 44)

- 5.30 A small mound identified on aerial photographs of unknown date and function, but possibly associated with World War Two training activity. No previous field investigations of this feature have taken place.

- 5.31 During the 2017 field survey a shallow bowl-shaped depression measuring 4.60m (E-W) by 4.7m (N-S) was identified at this location. No associated banks were present. Animal tracks pass through the feature, and it is clear of thick grass so may be being used as an animal shelter. It is also visible on LiDAR data as a depression.

MMO3190 – Possible World War Two military training site on Withypool Hill (Plate 45)

- 5.32 A small mound identified on aerial photographs, measuring approximately 8m diameter, of unknown date and function but possibly associated with World War Two training activity. No previous field investigations of this feature have taken place.

- 5.33** During the 2017 field survey a shallow depression measuring 8.11m long (E-W) by 7.32m (N-S) by 0.50m deep was identified at this location, with barely perceptible surrounding banks. The feature is being used by animals for shelter, but no associated erosion is present. It is also visible on LiDAR data as a depression.

MMO3191 – Possible World War Two military training site on Withypool Hill
(Plate 46)

- 5.34** A small mound identified on aerial photographs, measuring approximately 7m diameter, of unknown date and function but possibly associated with World War Two training activity. No previous field investigations of this feature have taken place.
- 5.35** During the 2017 field survey a shallow depression measuring 6m long (E-W) by 5.76 (N-S) by 0.4m deep was identified at this location, with a slight bank on its northeast side only. The feature is clear of grass and heather, and may be being used by animals for shelter; no associated erosion is present. It is also visible on LiDAR data as a very small depression.

MMO3192 – Possible World War Two military earthwork on Withypool Hill (Plate 47)

- 5.36** A small mound identified on aerial photographs, measuring approximately 10m diameter, of unknown date and function but possibly associated with World War Two training activity. No previous field investigations of this feature have taken place.
- 5.37** During the 2017 field survey a shallow depression measuring 9.1m long (E-W) by 8.1m (N-S) by 0.3m deep was identified at this location, with slight channels leading into the feature on its northeast and south sides. Slight separate banks are present on its north, east and south sides. There are animal tracks nearby, and the feature may be being used by animals for shelter; no associated erosion is present.

MMO3193 – World War Two features near West Water Combe

- 5.38** A group of 9 possible earthwork features on average 9m in diameter, possibly representing temporary weapons emplacement of World War Two date. No previous field investigations of these features have taken place. Their mapped extent partly falls within the survey area.
- 5.39** A single feature was identified during the 2017 field survey. The mapped extent of these features contains dense, tall gorse and grasses that may obscure other features. The recorded feature is a shallow trench of approximately 4m², surrounded by a continuous bank on its north, east and west sides, measuring between 2.5m and 4m wide, with a sharp inner slope and gentler outer slope (Plate 48).

6. THE GEOPHYSICAL SURVEY *by Ross Dean*

- 6.1** Both the magnetic and earth resistance responses were sufficient to be able to differentiate anomalies representing possible archaeological features. Forty-one magnetic data anomalies and twenty-two resistance anomalies were characterised as representing potential archaeological deposits and features and these are summarised here with the detail presented in Appendix 1.
- 6.2** A disrupted, sub-circular resistance anomaly group followed the course of a modern path surrounding Withypool Stone Circle (MSO8682) and the most likely explanation

is that this anomaly group represents the path. The magnetic data within and around the stone circle has a number of anomalies that could be interpreted as pits or large postholes. Whilst some of these are most likely to represent natural deposits, their association with the stone circle made their mapping as potential archaeological deposits prudent. One group appeared to form a linear pattern of potential pits.

- 6.3 One, and possibly two magnetic anomaly groups with characteristics often associated with intense, *in situ* heating were recorded within the Withypool Stone Circle (MSO8682). Two similar magnetic anomaly groups were recorded adjacent to the bowl barrow (MSO8683).
- 6.4 Both the magnetometer and resistance data contained evidence for structural components within the bowl barrow situated in the northeast of the geophysical survey area (MSO8683). It is clear the resistance data reflected different, probably slightly deeper deposits in the barrow than those represented by the magnetic data. The resistance anomaly groups around and within the barrow strongly suggested the presence of an external encompassing ditch and a barrow with a relatively stony composition. Both data sets contained evidence of disturbance at the barrow summit and the likely presence of robber and/or excavation trenches.
- 6.5 The magnetometer data contained evidence for a number of cairns, only one of which was previously recorded (MSO8756). The anomalies manifested as relatively high, positive responses. Such patterns can imply the presence of burnt material.
- 6.6 Two resistance anomaly groups were likely to represent two small mounds, the age and function of which are uncertain but it may be associated with military training activities of Second World War date (MMO3191). Other magnetic groups appeared to represent disturbed ground with ferrous material present and these also may be of Second World War date.

7. ARCHIVE AND OASIS ENTRY

- 7.1 The digital archive is presented on a CD accompanying the printed version of this report and will be held by the ENPA HER.
- 7.2 An OASIS entry has been completed under the unique identifier **278301**.

8. SOURCES CONSULTED

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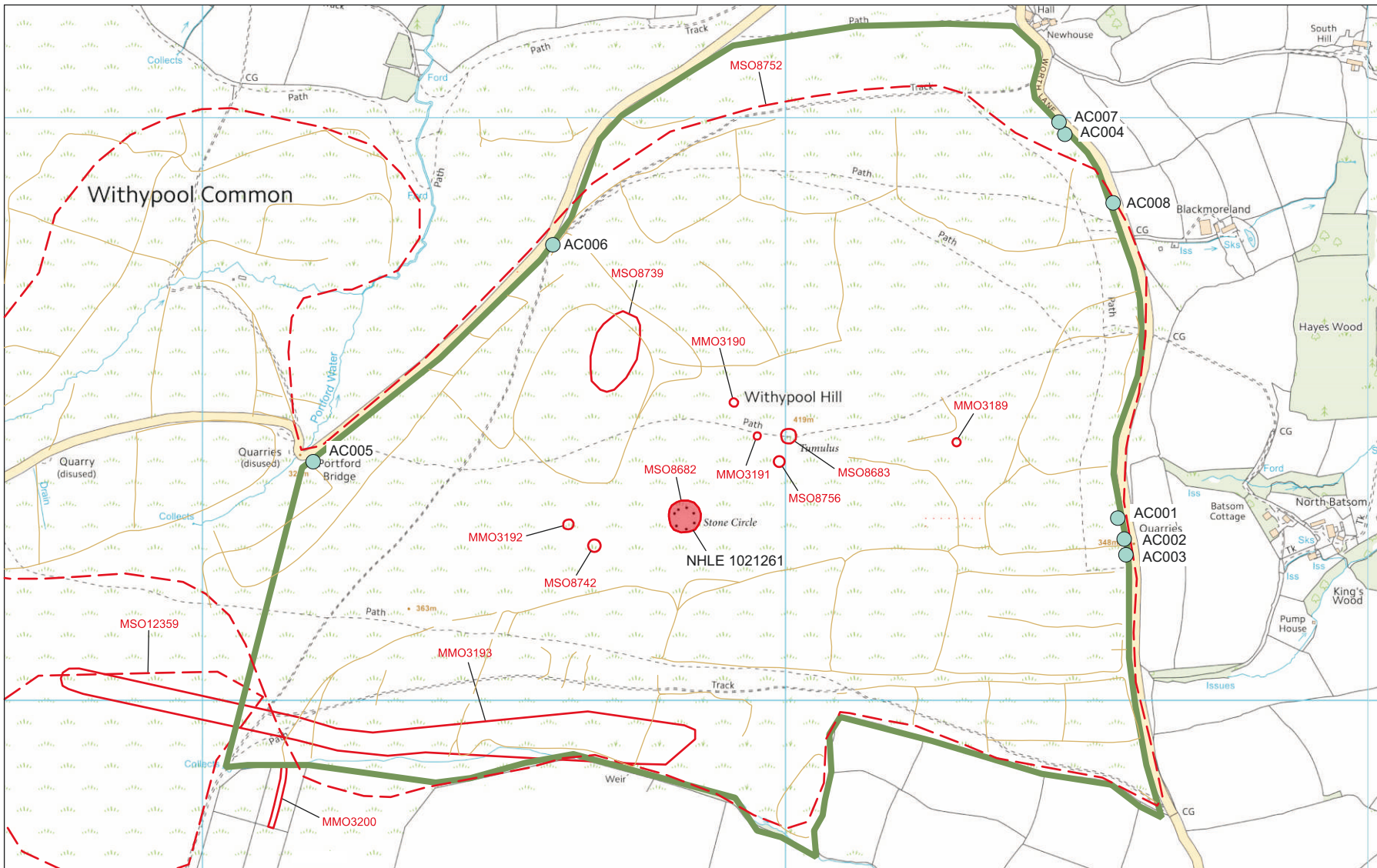


 Study area



PROJECT
Withypool Hill, Withypool, Exmoor National Park

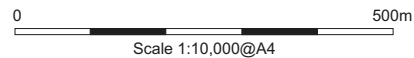
TITLE
Fig. 1: Site Location



Plan supplied by Exmoor National Park Authority












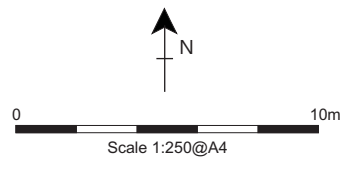
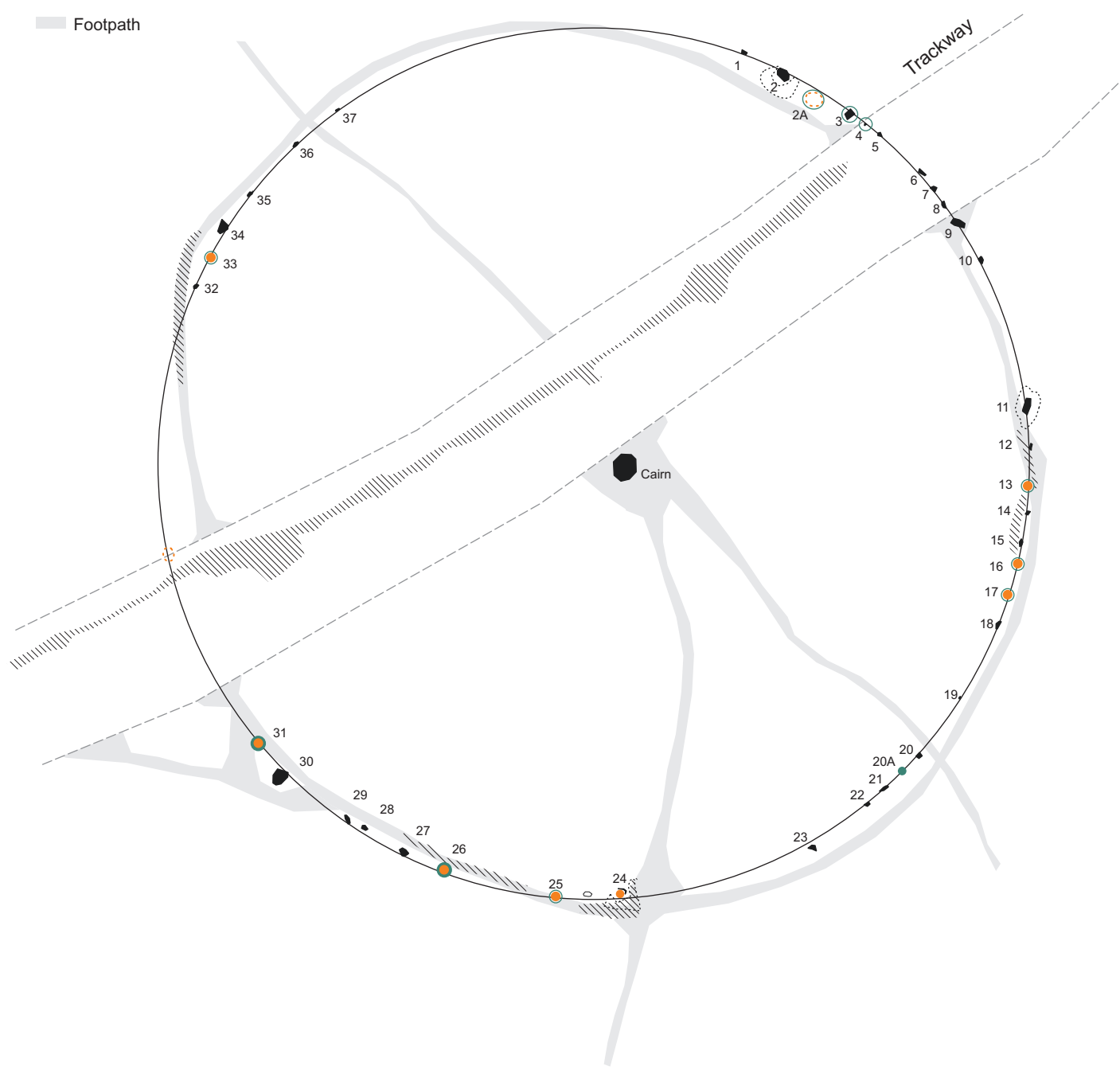
- Study area
- Heritage assets
- AC ● Sites identified from survey
- Identified from ? (after McDonnell)



PROJECT
Withypool Hill, Withypool,
Exmoor National Park

TITLE
Fig. 2: Location of heritage assets

-  *In situ* stones
-  Hollow
-  Socket
-  Erosion
-  Footpath
-  Visible on 1906 survey
-  Hollow on 1906 survey
-  Visible on 1989 survey
-  Not visible on 1989 survey



PROJECT
 Withypool Hill, Withypool, Exmoor National Park

TITLE
 Fig. 4: Comparison between the 2017 survey and previous plans of the Withypool Stone Circle





Plate 1: Withypool Stone Circle, view to the west (1m scale)



Plate 2: Withypool Stone Circle, Stone 1, view from SSW (0.5m scale)



Plate 3: Withypool Stone Circle, Stone 2, view from NNE (0.5m scale)



Plate 4: Withypool Stone Circle, Stone 3, view from southwest (0.5m scale)



Plate 5: Withypool Stone Circle, Stone 4, view from southwest (0.5m scale)



Plate 6: Withypool Stone Circle, Stone 5, view from southwest (0.5m scale)



Plate 7: Withypool Stone Circle, Stone 6, view from southwest (0.5m scale)



Plate 8: Withypool Stone Circle, Stone 7, view from southwest (0.5m scale)



Plate 9: Withypool Stone Circle, Stone 8, view from southwest (0.5m scale)



Plate 10: Withypool Stone Circle, Stone 9, view from southwest (0.5m scale)



Plate 11: Withypool Stone Circle, Stone 10, view from southwest (0.5m scale)



Plate 12: Withypool Stone Circle, Stone 11, view from west (0.5m scale)



Plate 13: Withypool Stone Circle, Stone 12, view from west (0.5m scale)



Plate 14: Withypool Stone Circle, Stone 14, view from WNW (0.5m scale)



Plate 15: Withypool Stone Circle, Stone 15, view from WNW (0.5m scale)



Plate 16: Withypool Stone Circle, Stone 15, view from northwest (0.5m scale)



Plate 17: Withypool Stone Circle, Stone 19, view from northwest (0.5m scale)



Plate 18: Withypool Stone Circle, Stone 20, view from NNW (0.5m scale)



Plate 19: Withypool Stone Circle, Stone 21, view from NNW (0.5m scale)



Plate 20: Withypool Stone Circle, Stone 22, view from NNW (0.5m scale)



Plate 21: Withypool Stone Circle, Stone 23, view from NNW (0.5m scale)



Plate 22: Withypool Stone Circle, Stone 24, view from north (0.5m scale)



Plate 23: Withypool Stone Circle, Stone 27, view from northeast (0.5m scale)



Plate 24: Withypool Stone Circle, Stone 28, view from northeast (0.5m scale)



Plate 25: Withypool Stone Circle, Stone 29, view from northeast (0.5m scale)



Plate 26: Withypool Stone Circle, Stone 30, view from northeast (0.5m scale)



Plate 27: Withypool Stone Circle, Stone 32, view from ESE (0.5m scale)



Plate 28: Withypool Stone Circle, Stone 34, view from ESE (0.5m scale)



Plate 29: Withypool Stone Circle, Stone 35, view from southeast (0.5m scale)



Plate 30: Withypool Stone Circle, Stone 36, view from southeast (0.5m scale)



Plate 31: Withypool Stone Circle, Stone 37, view from southeast (0.5m scale)



Plate 32: Withypool Stone Circle, track through circle, view to the east (1m scale)



Plate 33: Withypool Stone Circle, modern cairn within circle, view to the NNE (1m scale)



Plate 34: Bronze Age bowl barrow on Withypool Hill (MSO8683), view to the northeast (1m scale)



Plate 35: Prehistoric cairn on Withypool Hill (MSO8756), view to the WNW (1m scale)



Plate 36: Medieval or post-medieval field system on Withypool Hill (MSO8752), NW field system, possible quarry, view to the northwest (1m scale)



Plate 37: Medieval or post-medieval field system on Withypool Hill (MSO8752), SE field system, hedgebank, view to the WNW (1m scale)



Plate 38: Medieval or post-medieval field system on Withypool Hill (MSO8752), SE field system, trackways cutting hedgebanks, view to the WNW (1m scale)



Plate 39: Quarry (AC001), view to the west (1m scale)



Plate 40: Quarry (AC002), view to the west (1m scale)



Plate 41: Quarry (AC003), view to the WNW (1m scale)



Plate 42: Quarry (AC005), view to the southeast (1m scale)



Plate 43: Location of guide post (AC006), view to the southeast (1m scale)



Plate 44: Possible World War Two training site at Withypool Hill (MMO3189), view to the south (1m scale)



Plate 45: Possible World War Two training site at Withypool Hill (MMO3190), view to the SSE (1m scale)



Plate 46: Possible World War Two training site at Withypool Hill (MMO3191), view to the north (1m scale)



Plate 47: Possible World War Two training site at Withypool Hill (MMO3192), view to the northwest (1m scale)



Plate 48: World War Two features near West Water Combe (MMO3193), view to the north (1m scale)

Appendix 1

Geophysics Survey Report



An archaeological magnetometer and resistance survey

Withypool Hill, Withypool, Exmoor National Park

Centred on NGR (E/N): 283906,134371 (point)

Report: 1612WIT-R-1

Ross Dean BSc MSc MA MCifA

23 March 2017

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Website: substrata.co.uk

For an overview of Substrata, our archaeological geophysical surveying techniques and the results we obtain.

1 Survey description and summary

1.1 Survey

Type: twin-sensor fluxgate gradiometer (magnetometer)
twin-probe earth resistance
Dates: between 31 January 2017 and 6 February 2017
Area: 3.3ha for each survey
Lead surveyor: Mark Edwards BA
Author: Ross Dean BSc MSc MA MifA

1.2 Client

AC Archaeology Ltd, 4 Halthaies Workshops, Bradninch Nr Exeter, Devon EX5 4QL

1.3 Site information

Site: Withypool Hill
Civil Parish: Withypool and Hawkridge
District: West Somerset
County: Somerset
Local Authority: Exmoor National Park Authority
NGR: SS 839 344 (point)
Ordnance Survey NGR (E/N): 283906,134371 (point)
Nearest Postcode: TA24 7RG

1.4 Historic Environment Record of monuments within the survey area

MSO8683 and scheduled monument 1021261: A bowl barrow on Withypool Hill disturbed by robbing and possible excavation. The barrow mound measures 20.5m in diameter and stands roughly 1.1m high. A modern cairn has been built on the eastern side of the summit.

MSO3191: A small mound is visible on aerial photographs of the 1940s as an earthwork on Withypool Hill. The age and function of the mound are uncertain but it may be associated with military training activities of Second World War date.

MSO8756 and scheduled monument 1021261: A prehistoric cairn is visible as a turf covered stony mound 3.5m in diameter and 0.3m high.

MSO8682 and scheduled monument 1021262: The remains of a stone circle on the southwest slope of Withypool Hill. It is alleged that it once consisted of 100 stones, but survey in 1989 revealed 27 upright stones and 3 fallen ones. The diameter of the circle is approximately 36m.

1.5 Archive

OASIS number: substrat1-280329
Archive: At the time of writing, the archive of this survey will be held by Substrata.

1.6 Introduction

This report presents the results of magnetometer and resistance surveys at the above site, hereafter referred to as the survey area. It has been prepared for AC Archaeology Ltd on behalf of the Exmoor National Park Authority and Historic England. It is part of a larger body of work funded by Historic England aimed at better recording the above listed known monuments to inform future management and prevent further damage, both to the sites and any buried features associated with them. The survey is intended to deploy modern remote prospecting techniques on the sites and part of their setting.

A planned ground penetrating radar survey across the barrow and cairn was abandoned after inspecting the ground conditions. The barrow had a disturbed and stony summit and boggy ground to the north which precluded a good ground contact for the radar equipment. Similar conditions were found on the cairn.

1.7 Summary

Both the magnetic and earth resistance responses were sufficient to be able to differentiate anomalies representing possible archaeological features. Forty-one magnetic data anomalies and twenty-two resistance anomalies were characterised as representing potential archaeological deposits and features.

Both the magnetometer and resistance data contained evidence for structural components with in the bowl barrow situated in the northeast of the geophysical survey area (HER MSO8683). It is clear the resistance data reflected different, probably slightly deeper deposits in the barrow than those represented by the magnetic data. The resistance anomaly groups around and within the barrow strongly suggested the presence of an external encompassing ditch and a barrow with a relatively stony composition. Both data sets contained evidence of disturbance at the barrow summit and the likely presence of robber and/or excavation trenches.

The magnetometer data contained evidence for a number of cairns, only one of which was previously recorded (HER MSO8756). The anomalies manifested as relatively high, positive responses. Such patterns can imply the presence of burnt material.

Two magnetic anomaly groups with characteristics often associated with intense, in-situ heating were recorded adjacent to the bowl barrow. One, and possibly two similar groups were recorded within the Withypool stone circle (HER MSO8682).

A disrupted, sub-circular resistance anomaly group followed the course of a modern path surrounding Withypool stone circle and the most likely explanation is that this anomaly group represents the path. The magnetic data within and around the stone circle has a number of anomalies that could be interpreted as pits or large postholes. Whilst some these are most likely to represent natural deposits, their association with the stone circle made their mapping as potential archaeological deposits prudent. One group appeared to form a linear pattern of potential pits.

Two resistance anomaly groups were likely to represent two small mounds, the age and function of which are uncertain but it may be associated with military training activities of Second World War date (HER entry MMO3191). Other magnetic groups appeared to represent disturbed ground with ferrous material present and these also may be of Second World War date.

Other anomaly groups representing potential archaeological deposits or features are discussed in Section 4.

2 Survey aims and objectives

2.1 Aims

The survey is part of a suite of works funded by Historic England aimed at recording the monuments to inform future management and prevent further damage, both to the sites and any buried features associated with them. The survey is intended to deploy modern remote prospecting techniques on the sites and part of their setting.

2.2 Objectives

1. To identify any below ground structural components of the stone circle and barrows (such as ditches, pits, burning activity, cists, walling etc.).
2. To ascertain the presence/absence of an encircling ditch or kerb to the barrow and cairn.
3. To identify any adjacent archaeological features.
4. To build on our knowledge of surveying sites of this type from previous geophysical survey work carried out at the Chapman Barrows and Porlock Stone Circle.
5. To use a range of modern remote sensing techniques including gradiometry, and earth resistance.

3 Standards

The standards used to complete this survey are defined by the Chartered Institute for Archaeologists (2014a) and Historic England (2010). The codes of approved practice that were followed are those of the Chartered Institute for Archaeologists (2014b) and Archaeology Data Service/Digital Antiquity Guides (undated).

4 Results, discussion and conclusions

4.1 Scope and definitions

This survey was designed to record magnetic and resistance anomalies.

A magnetic anomaly is a local variation in the Earth's magnetic field. Such variations can result from differences in the chemistry or magnetism of underlying solid geology, superficial geology and other near-surface deposits including those altered and created by past human activities. Near-surface artefacts can also create magnetic anomalies.

A resistance anomaly is a local variation in the electrical resistance of a soil and is related to its porosity, permeability, saturation, and chemical nature of entrapped fluids (Heimmer and De Vore, 1995:30), all of which can be altered by past human activities. Higher concentrations of ions allow electrical current to pass more easily through the soil, creating a lower electrical resistance.

The terms 'archaeological deposit', 'structure' and 'feature' refer to any artefacts, material deposits or disturbance of natural deposits thought to be the result of human activity, excluding recent land maintenance and farming.

Magnetic and resistance anomalies cannot be regarded as physical archaeological deposits, structures or features and the dimensions of the anomalies shown do not represent the dimensions of any associated archaeology. They can be, however, indicative of archaeological deposits, structures, features or past human activity.

The analysis presented below identifies and characterises anomalies and anomaly groups that may relate to archaeological deposits, structures, features and past human activity.

The reader is referred to section 5.

4.2 Results

Figure 2 shows the interpretation of the magnetometer and resistance survey data sets and displays the anomalies relating to potential archaeological deposits only.

Figures 3 and 4 provide the complete interpretation of the magnetometer and resistance data sets respectively. The anomaly groups identified as possibly relating to archaeological deposits, structures or features along with their identifying labels. Figures 5 and 6 show the archaeological interpretation of the magnetometer and resistance survey data sets respectively over an Ordnance Survey map of the barrow. Figure 7 shows the combined archaeological interpretation of the magnetometer and resistance survey data sets over a map of Withypool stone circle produced by AC Archaeology. Tables 1 and 2 (magnetometer and resistance surveys respectively) are extracts of the detailed analysis of the survey data sourced from the attribute tables of the GIS project provided in the project archive.

Figures 2 to 7 along with Tables 1 and 2 comprise the analysis of the survey data.

Various plots of the processed data as specified in Tables 4 and 5 are provided in Figures 8 to 11.

Figures 12 and 13 are plots of the unprocessed magnetometer and resistance data along with the relevant metadata.

4.3 Discussion

4.3.1 General points

Discussion scope

Anomalies groups identified in Tables 1 and 2 as possibly representing archaeological deposits or features but which cannot be further characterised are not discussed below. All identified anomaly groups are recorded in the GIS project held the survey archive.

Data collection

Data collection within the survey area was restricted in a few places by boggy ground and vegetation as shown in the figures.

Anomaly characterisation and mapping

Referring to Figures 8 to 11, there are a number of anomaly groups that could be interpreted as relating to large postholes or pits although most will have natural origins. Anomalies of this sort are only mapped as potential archaeology if they are clustered in groups or otherwise form recognisable patterns.

Numerous dipole magnetic anomalies are scattered across the magnetometer data set. These are likely to represent recent ferrous objects. They are only mapped if they could influence the analysis of anomaly groups thought to have an archaeological origin.

Anomalies thought to relate to natural features and recent man-made objects were only mapped where they comprised significant magnetic responses across the dataset that needed clarification.

4.3.2 Magnetometer survey

Referring to Figure 3, based on the analysis of magnetic anomaly groups **m19** and **m20** which coincide with a known cairn described in the Historical Environment Record (HER) entry MSO8756, anomaly groups **m1**, **m2**, **m13 to 18**, **m25**, **m26**, **m28** and **m29** may represent similar cairns within the survey area. The relative magnitude of the positive magnetic response of these anomaly groups is suggestive of re-deposition of heated material but this is not certain.

Groups **m3**, **m4** and **m5** are most likely to represent disturbed ground with some ferrous material located close to a small mound, the age and function of which are uncertain but it may be associated with military training activities of Second World War date (HER entry MMO3191).

The bowl barrow targeted in the northern section of the survey area is thought to have been disturbed by robbing and possible excavation (HER MSO8683). Referring to Figure 5, magnetic anomalies **m7** and **m11** recorded around the periphery of the mound may represent the remnants of an encircling ditch (m7) and possibly a kerb (m11) but it is more likely that relatively shallow deposits and possibly near-surface disturbance are being recorded in the magnetic data. In particular, groups **m9** and **m10** are most likely to represent a modern cairn built on the eastern side of the summit and group **m11** may represent associated stony deposits. Within the cairn, group **m8** may represent a robber or excavation trench and coincides with similar resistance anomalies discussed below (group r10).

Groups **m6** and **m12** have characteristics often associated with high-intensity, in-situ heating of deposits. Given the proximity of the bowl barrow, groups **m6** and **m12** may be indicative of funerary activities such as cremation.

The magnetic data collected around Withypool stone circle (HER MSO8682) in the south-western section of the survey area includes a number of anomalies that have characteristics that can be associated with large postholes and pits (Figure 7). Group **m31** appears to represent a linear sequence of such features. Groups **m32**, **m33**, **m36** and **m40** are recorded because of their position within or adjacent to the stone circle. They may represent archaeological or natural deposits or a combination of both. Group **m30** may represent

relatively recent ground disturbance along the line of a modern track although an archaeological origin cannot be ruled out.

Anomaly group **m35** coincides with and represents a cairn recorded in a recent survey of the stone circle by AC Archaeology (Figure 7). Group **m38** may represent deposits subjected to high-intensity, in-situ heating such as those associated with metal working or cremation. Group **m37** may represent similar deposits but the position of this group on the line of a modern track and associated erosion suggests that the fortuitous orientation of an anomaly representing an iron or steel object is likely.

4.3.3 Resistance survey

Resistance anomaly groups **r1** and **r2** (Figure 4) are very similar in form and magnitudes. Group **r2** coincides and probably represents a small mound, the age and function of which are uncertain but it may be associated with military training activities of Second World War date (HER entry MMO3191). It is likely that **r1** represents a similar structure.

The resistance anomalies recorded adjacent to and within the bowl barrow situated in the northeast of the survey area (HER MSO8683) are shown in Figure 6. Group **r3** is most likely to represent an encircling ditch and group **r5** probably represents relatively stony deposits within the barrow. The form of **r5** appears to suggest a stony outer bank or revetment although this apparent structure may be the result of significant disruption to the barrow summit. Groups **r9**, **r11** and **r13** are likely to also reflect relatively stony material which has suffered disruption in the past. Groups **r4**, **r8**, **r10** and possibly **r12**, are all most readily explained as reflecting disturbance from robber and/or excavation trenches. Groups **r6** and **r7** may represent structural, relatively earthen deposits within the barrow. It is clear the resistance data reflected different, probably slightly deeper deposits in the barrow than those represented by the magnetic data.

Anomaly group **r18** coincides with a known cairn and are likely to represent this feature. In contrast with the magnetometer data for the same cairn, the resistance data does not appear to contain evidence of the other potential cairns discussed in Section 4.3.2 and **r18** was only characterised because of its proximity to the mapped cairn and the two magnetic anomaly groups **m19** and **m20**.

There are three resistance anomaly groups that have a truncated, sub-circular form (groups **r17**, **r19** and **r20**). They are recorded as representing potential archaeological deposits because of their proximity to the bowl barrow but only excavation would allow an assessment of whether they represent archaeological or natural deposits.

Group **r21** (Figure 7) is most likely to represent relatively compact deposits on and around the modern footpath encompassing Withypool stone circle. As the match between **r21** and the mapped modern path is not exact, there is a possibility that the anomaly group represents a former ditch but the footpath remains the more likely option.

Group **r22** is most likely to represent a footpath or routeway of unknown date and, if modern, less used than those represented by **r101** and **r102**.

4.4 Conclusions

Both the magnetic and earth resistance responses were sufficient to be able to differentiate anomalies representing possible archaeological features. Forty-one magnetic data anomalies and twenty-two resistance anomalies were characterised as representing potential archaeological deposits and features.

Both the magnetometer and resistance data contained evidence for structural components within the bowl barrow situated in the northeast of the geophysical survey area (HER MSO8683). It is clear the resistance data reflected different, probably slightly deeper deposits in the barrow than those represented by the magnetic data. The resistance anomaly groups around and within the barrow strongly suggested the presence of an external

encompassing ditch and a barrow with a relatively stony composition. Both data sets contained evidence of disturbance at the barrow summit and the likely presence of robber and/or excavation trenches.

The magnetometer data contained evidence for a number of cairns, only one of which was previously recorded (HER MSO8756). The anomalies manifested as relatively high, positive responses. Such patterns can imply the presence of burnt material.

Two magnetic anomaly groups with characteristics often associated with intense, in-situ heating were recorded adjacent to the bowl barrow. One, and possibly two similar groups were recorded within the Withypool stone circle (HER MSO8682).

A disrupted, sub-circular resistance anomaly group followed the course of a modern path surrounding Withypool stone circle and the most likely explanation is that this anomaly group represents the path. The magnetic data within and around the stone circle has a number of anomalies that could be interpreted as pits or large postholes. Whilst some these are most likely to represent natural deposits, their association with the stone circle made their mapping as potential archaeological deposits prudent. One group appeared to form a linear pattern of potential pits.

Two resistance anomaly groups were likely to represent two small mounds, the age and function of which are uncertain but it may be associated with military training activities of Second World War date (HER entry MMO3191). Other magnetic groups appeared to represent disturbed ground with ferrous material present and these also may be of Second World War date.

Other anomaly groups representing potential archaeological deposits or features are discussed in Section 4.

5 Disclaimer and copyright

The description and discussion of the results presented in this report are the authors, based on his interpretation of the survey data. Every effort has been made to provide accurate descriptions and interpretations of the geophysical data set. The nature of archaeological geophysical surveying is such that interpretations based on geophysical data, while informative, can only be provisional. Geophysical surveys are a cost-effective early step in the multi-phase process that is archaeology. The evaluation programme of which this survey is part may also be informed by other archaeological assessment work and analysis. It must be presumed that more archaeological features will be evaluated than those specified in this report.

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6 Acknowledgements

Substrata would like to thank John Valentin of AC Archaeology Ltd for commissioning us to complete this survey.

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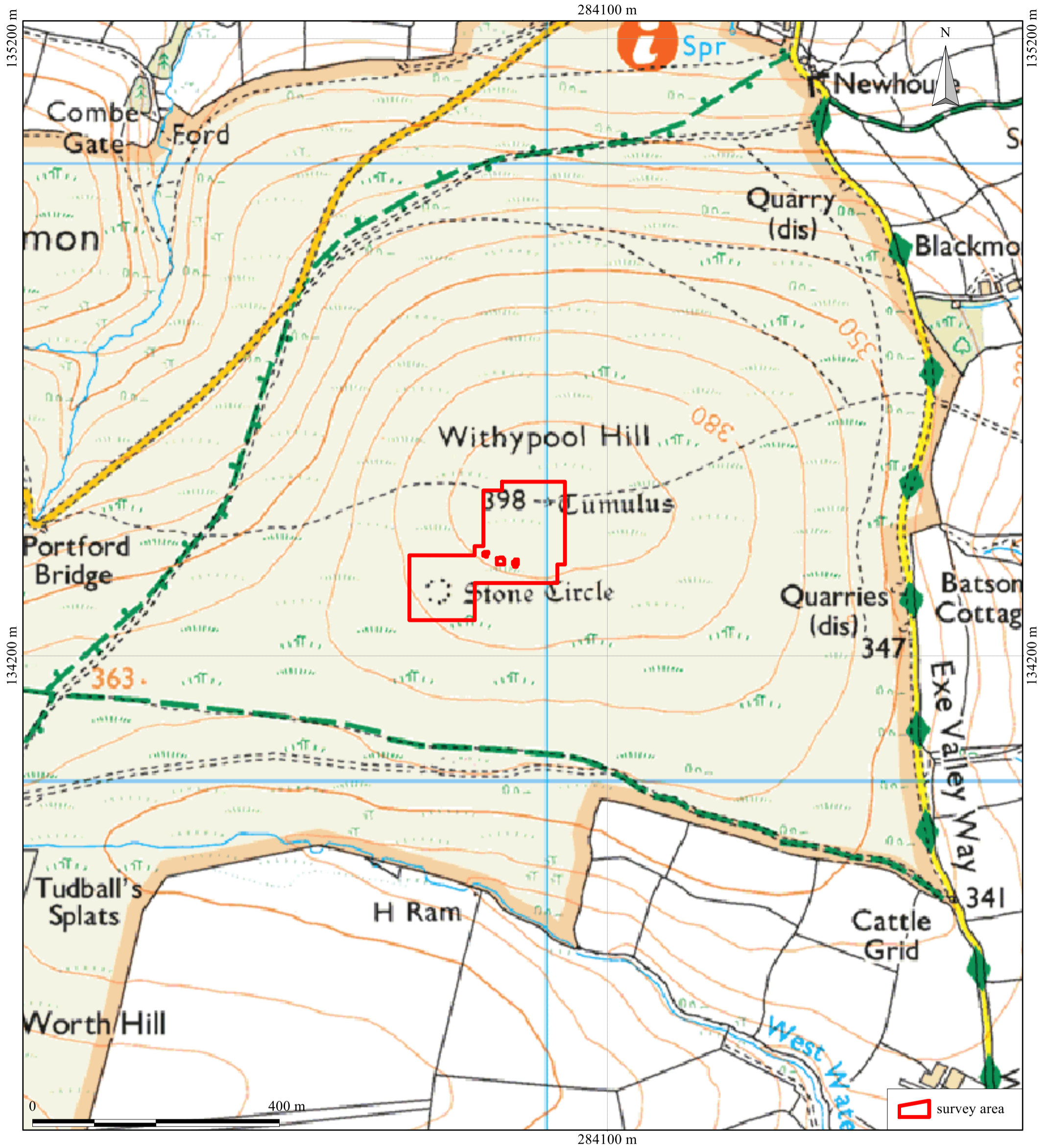
Appendix 1 Supporting plots and analysis table

General Guidance

The anomalies represented in the survey plots provided in this appendix are magnetic anomalies. The apparent size of such anomalies and anomaly patterns are unlikely to correspond exactly with the dimensions of any associated archaeological features.

A rough rule for interpreting magnetic anomalies is that the width of an anomaly at half its maximum reading is equal to the width of the buried feature, or its depth if this is greater (Clark, 2000: 83). Caution must be applied when using this rule as it depends on the anomalies being clearly identifiable and distinct from adjacent anomalies. In northern latitudes the position of the maximum of a magnetic anomaly will be displaced slightly to the south of any associated physical feature.

A rough rule for interpreting resistance anomalies is that if an x-y trace is drawn of the resistance over an anomaly, then the width of an anomaly at half its maximum height is equal to the width of the buried feature. Caution must be applied when using this rule as it depends on the anomalies being clearly identifiable and distinct from adjacent anomalies and it should be noted that the relationship between change in resistance response and depth is not linear (Gaffney and Gater, 2003: 112).



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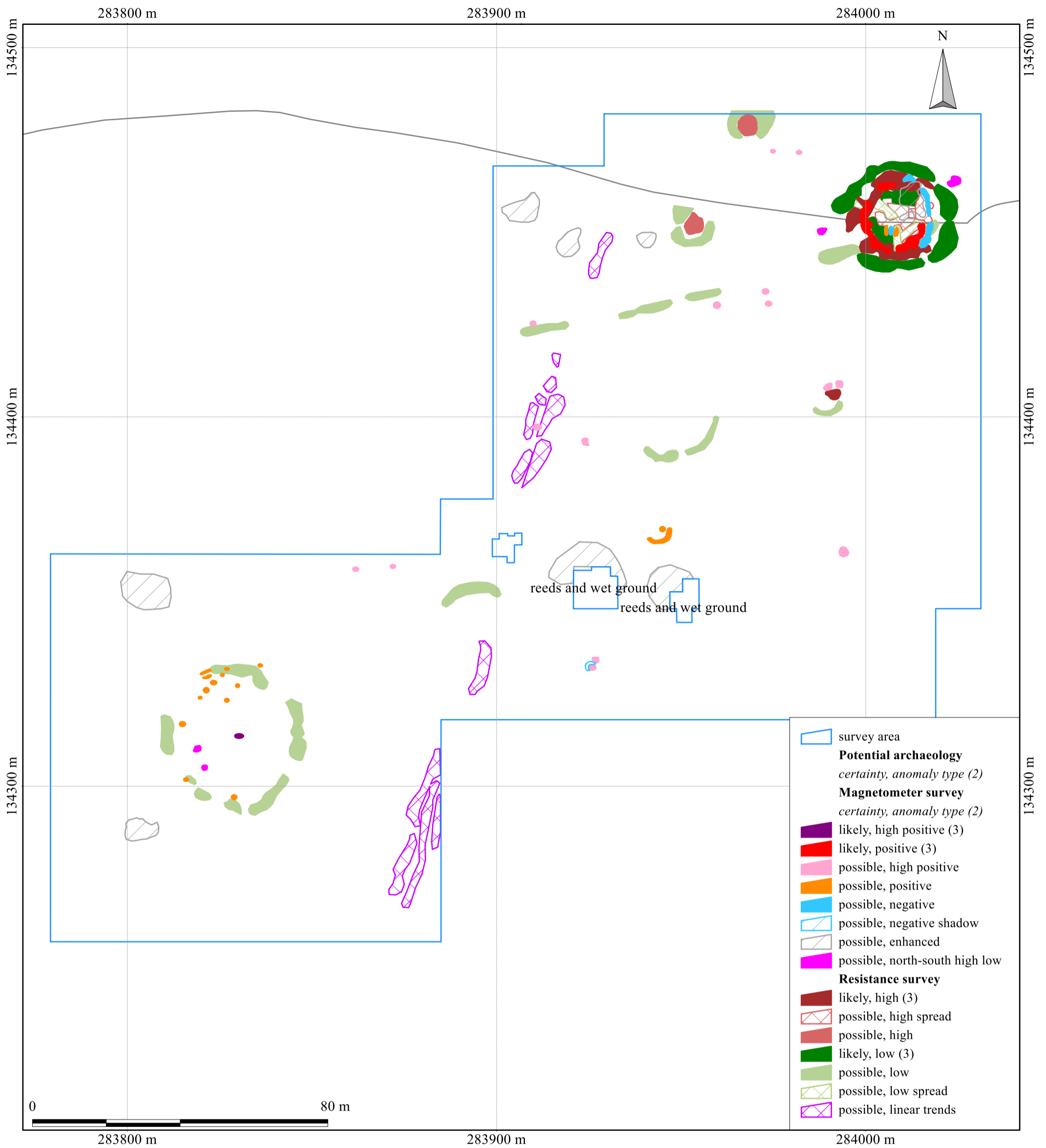
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 Base map: Copyright Ordnance Survey

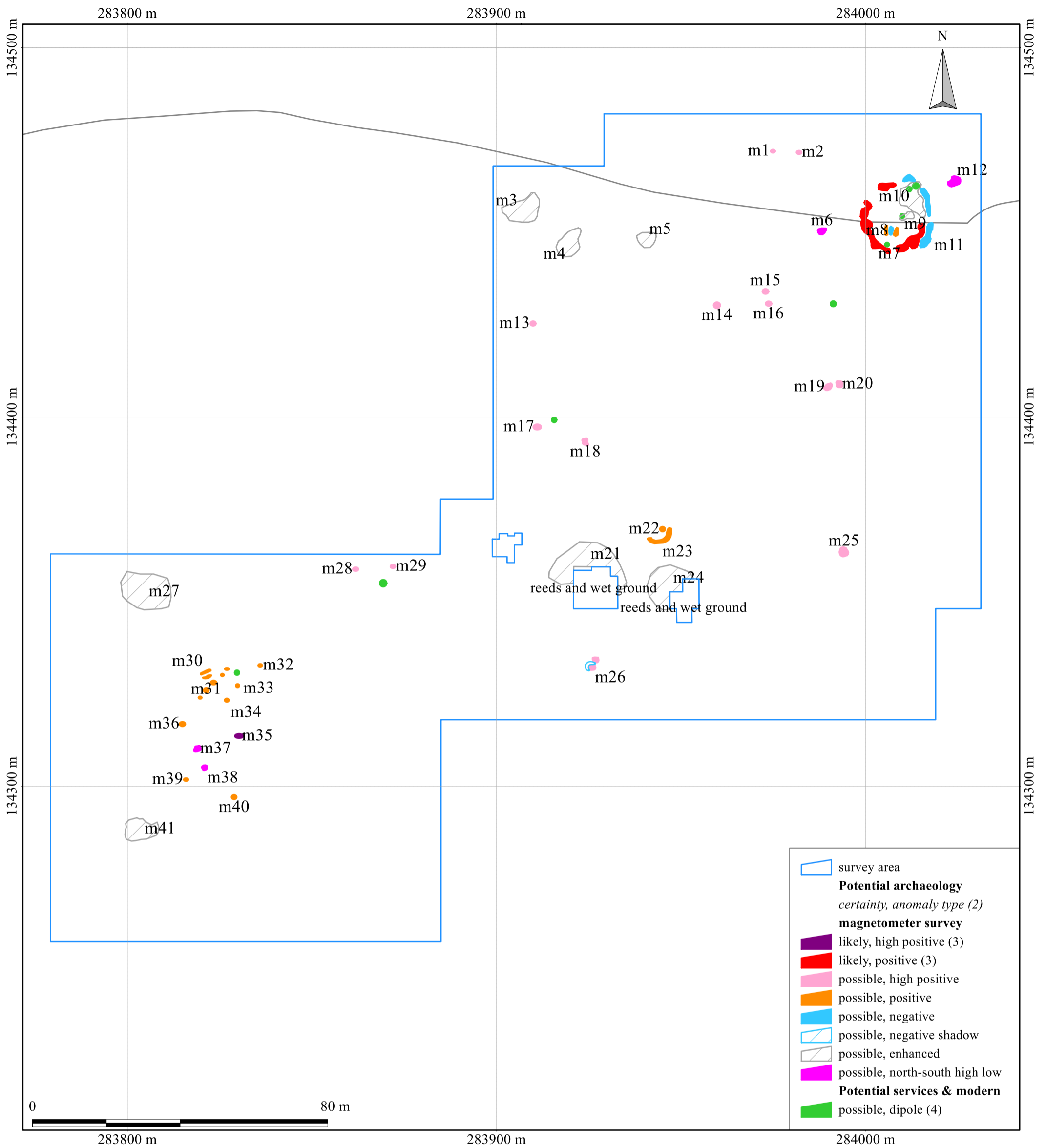
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An archaeological magnetometer and resistance survey
 Withypool Hill, Withypool, Exmoor National Park
 Centred on NGR (E/N) 283906,134371
 Report: 1612WIT-R-1

Figure 1: geophysical survey area

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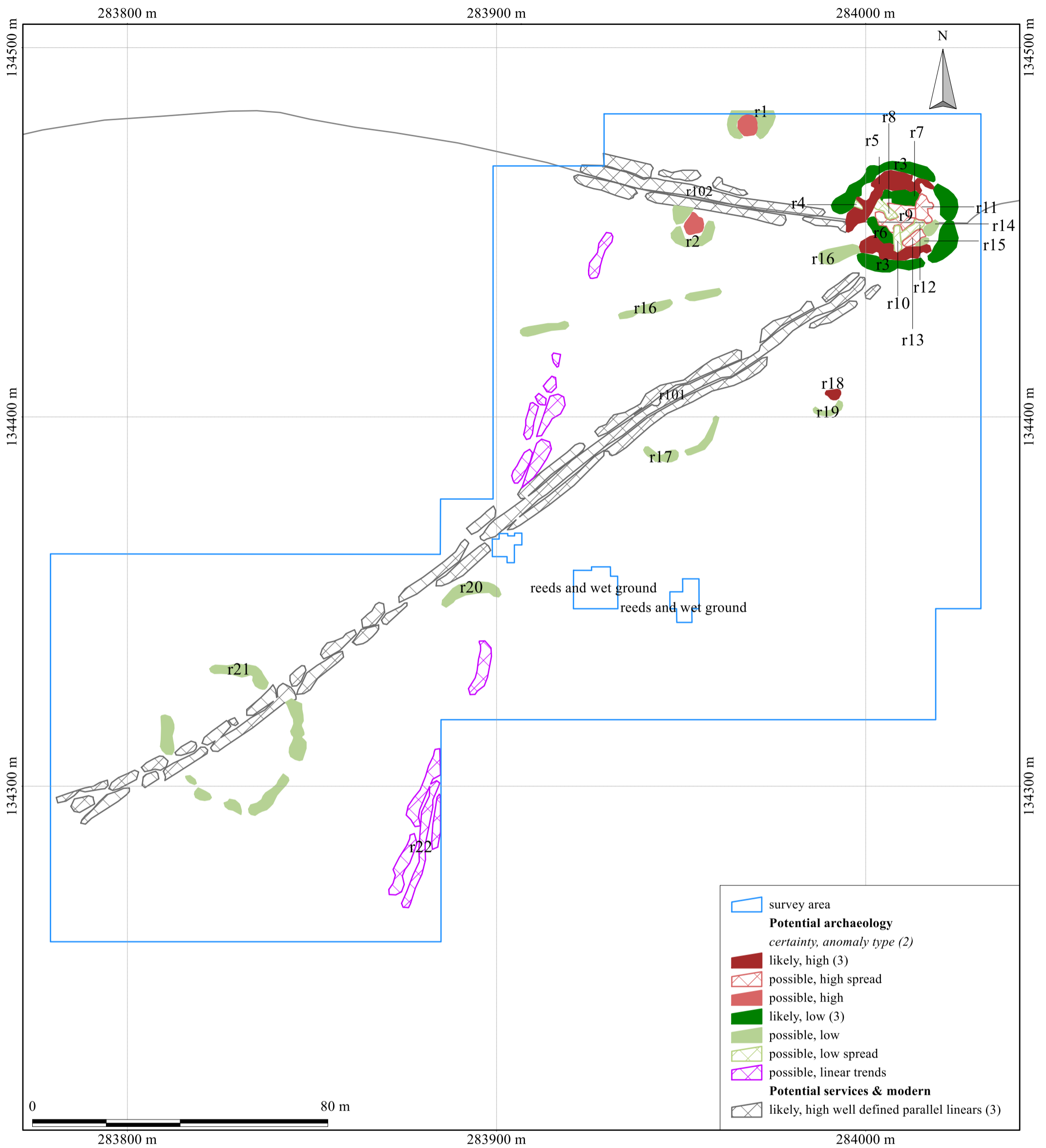
Notes:

1. All interpretations are provisional and represent potential archaeological deposits.
2. 'Anomaly type' is a description of the magnetic anomaly. See the report text or GIS for an archaeological characterisation.
3. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.
4. Not all instances are mapped.
5. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

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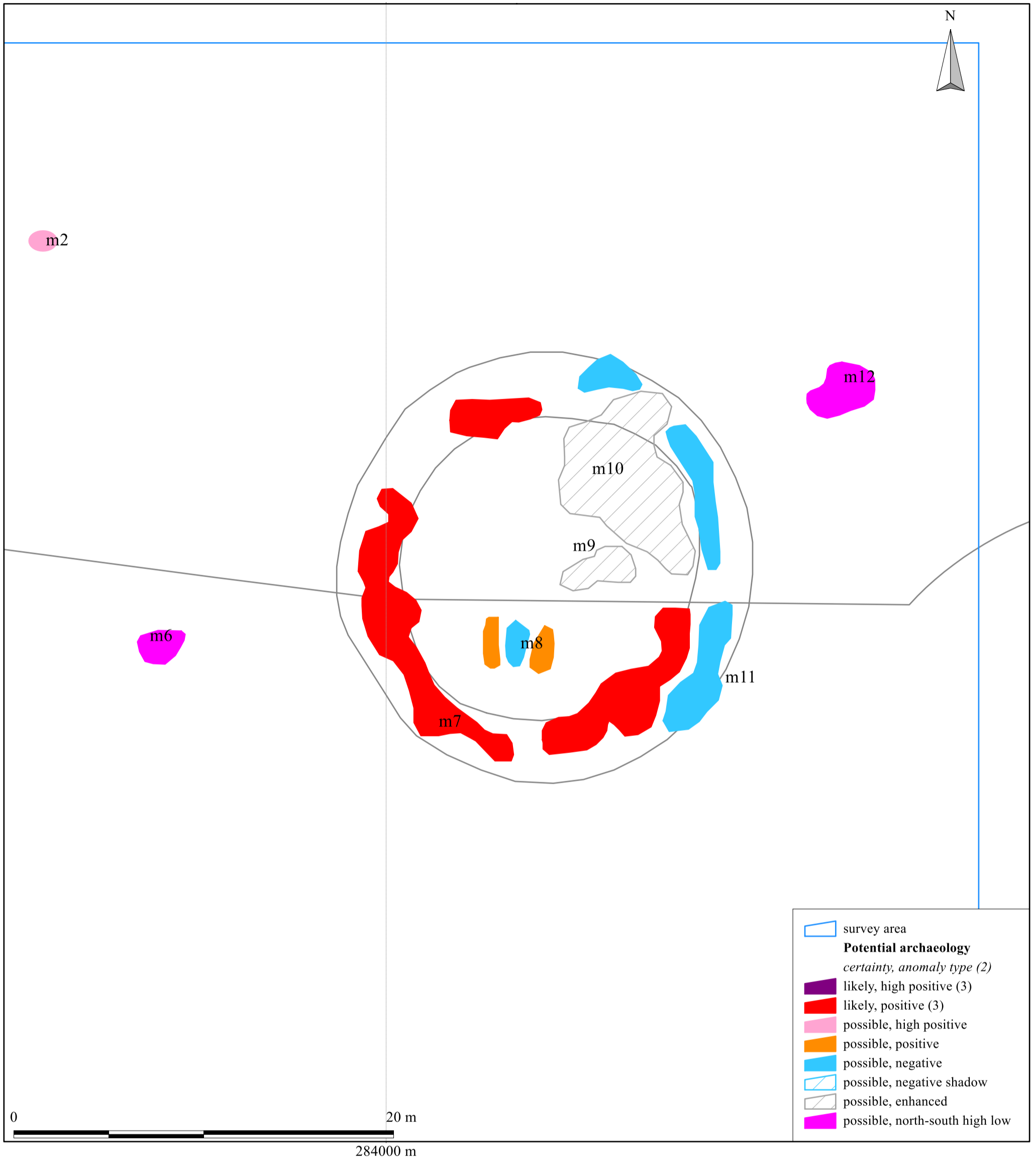
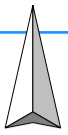
Figure 3: magnetometer survey interpretation

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284000 m

N



British Grid
centre X: 284006.88 m, centre Y: 134454.19 m

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Scale: 1:200 @ A3. Spatial Units: Meter. Do not scale off this drawing

Notes:

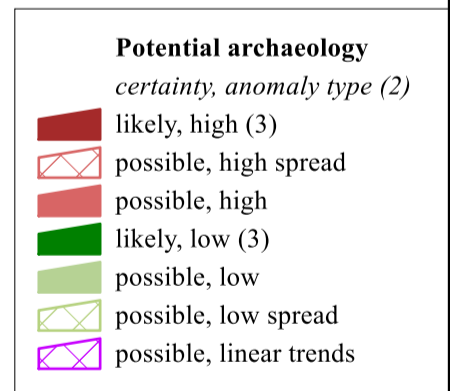
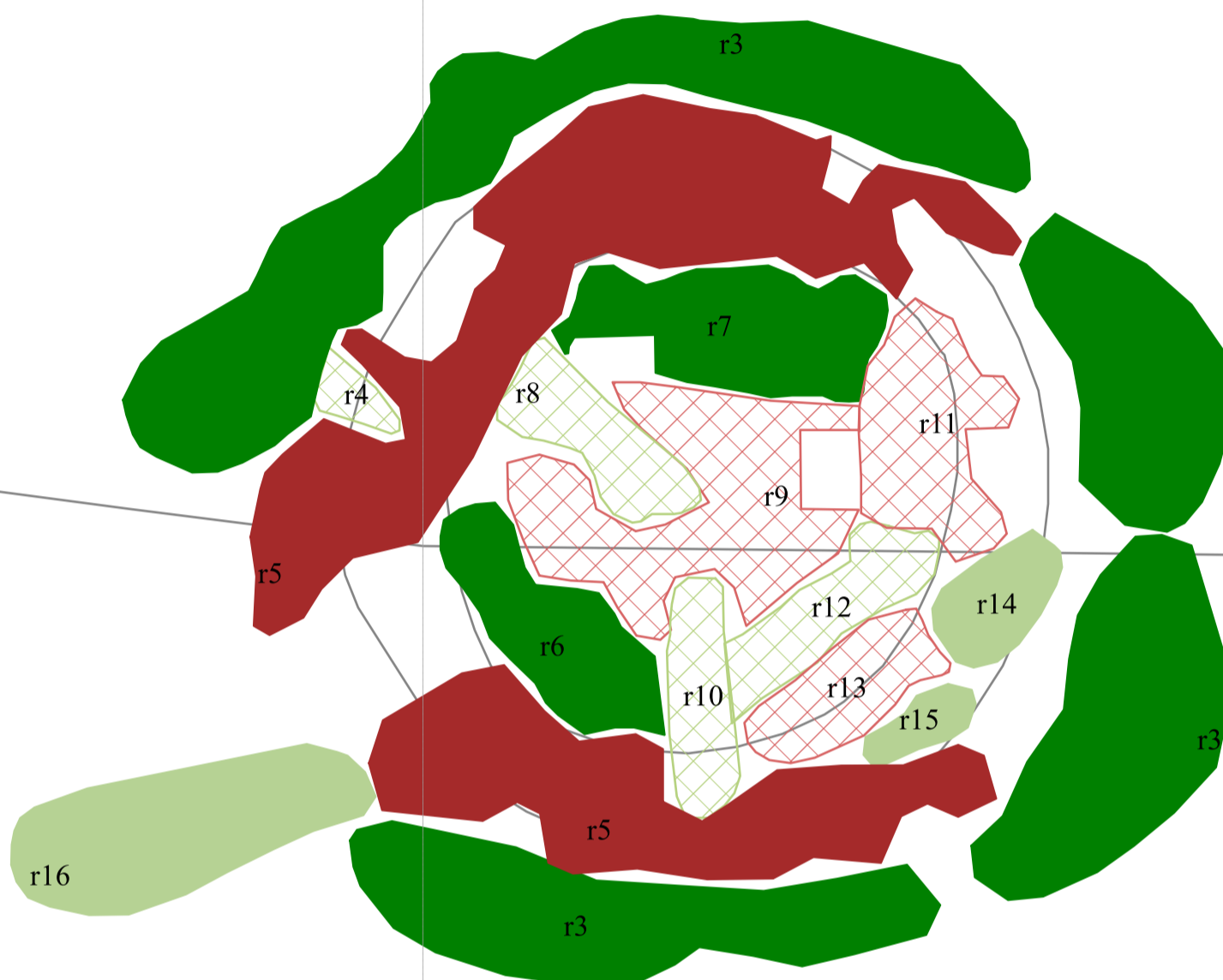
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Figure 5: magnetometer survey interpretation
over map of barrow (HER MSO8683),
anomalies relating to potential archaeology only

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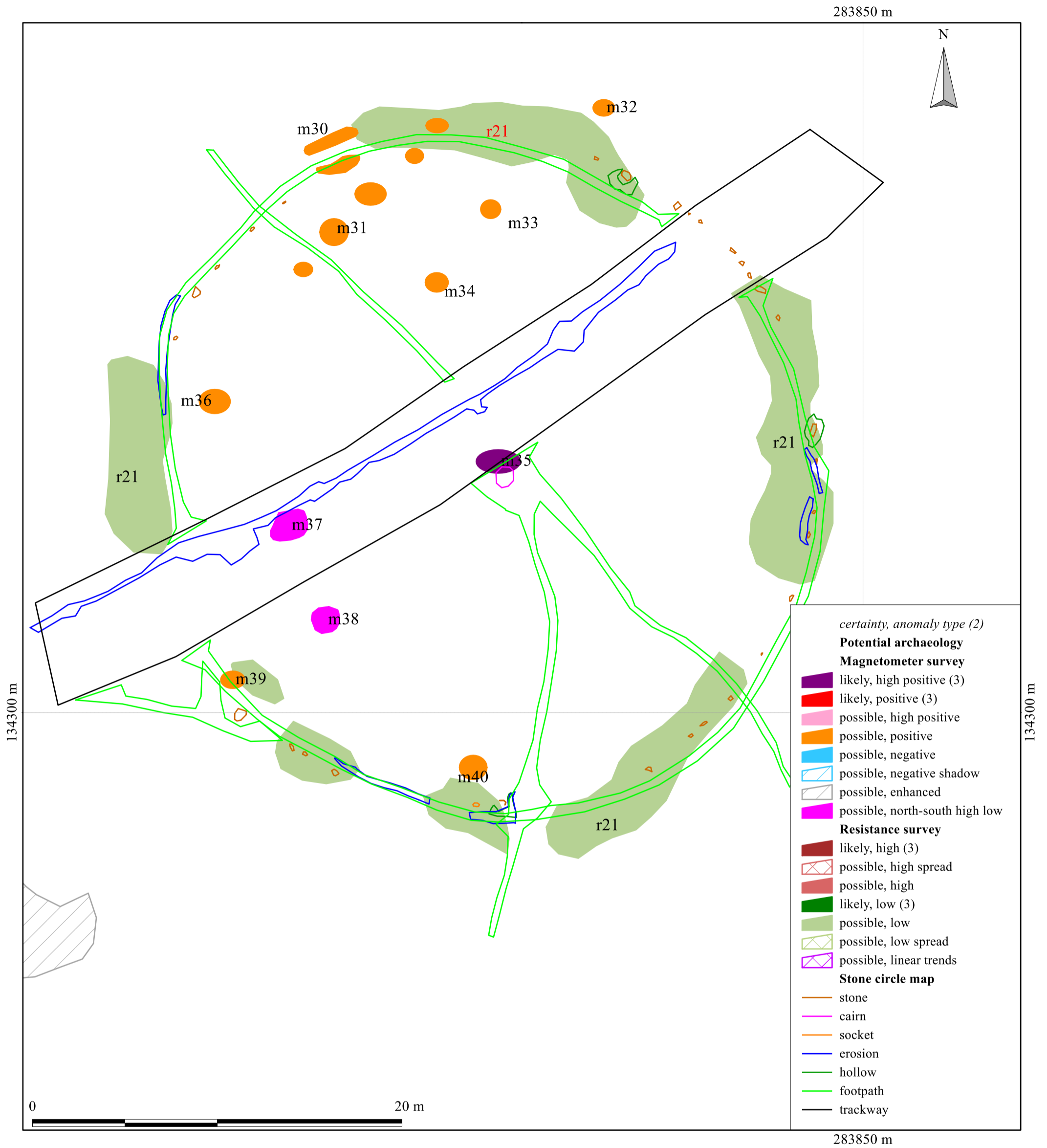
Notes:

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4. Not all instances are mapped.
5. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

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Figure 6: resistance survey interpretation
 over map of barrow (HER MSO8683),
 anomalies relating to potential archaeology only

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Map of Withypool stone circle: Copyright AC Archaeology Ltd
Base map: Copyright Ordnance Survey

Scale: 1:200 @ A3. Spatial Units: Meter. Do not scale off this drawing

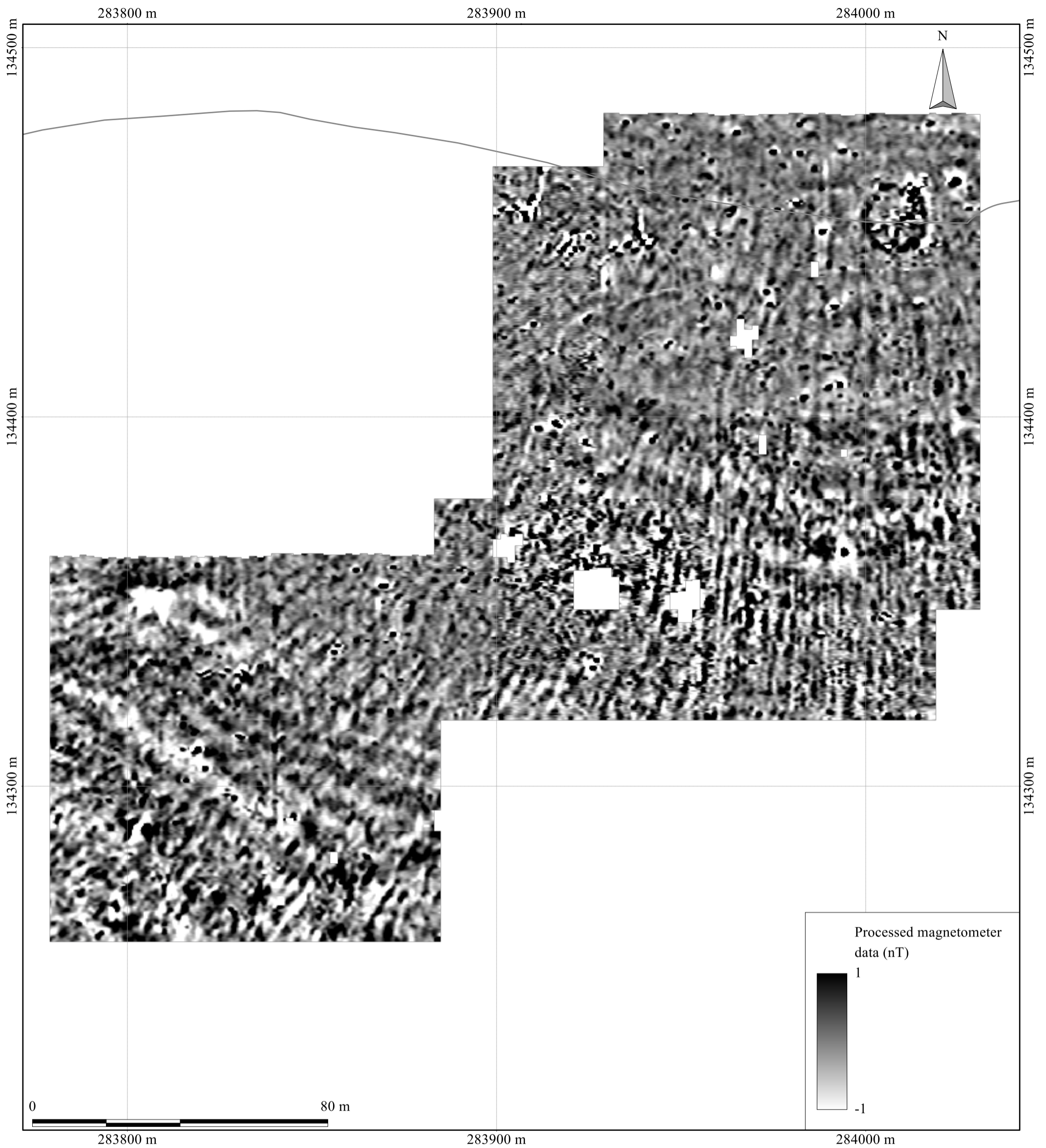
Notes:

1. All interpretations are provisional and represent potential archaeological deposits.
2. 'Anomaly type' is a description of the magnetic anomaly. See the report text or GIS for an archaeological characterisation.
3. Anomalies designated "likely archaeology" have supporting evidence e.g. historical maps and or visible earthworks.
4. Not all instances are mapped.
5. Anomalies likely to represent geological or other natural deposits are not mapped unless relevant to potential archaeological events or deposits.

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Figure 7: magnetometer & resistance survey interpretation
over map of Withypool stone circle (HER MSO8682),
anomalies relating to potential archaeology only

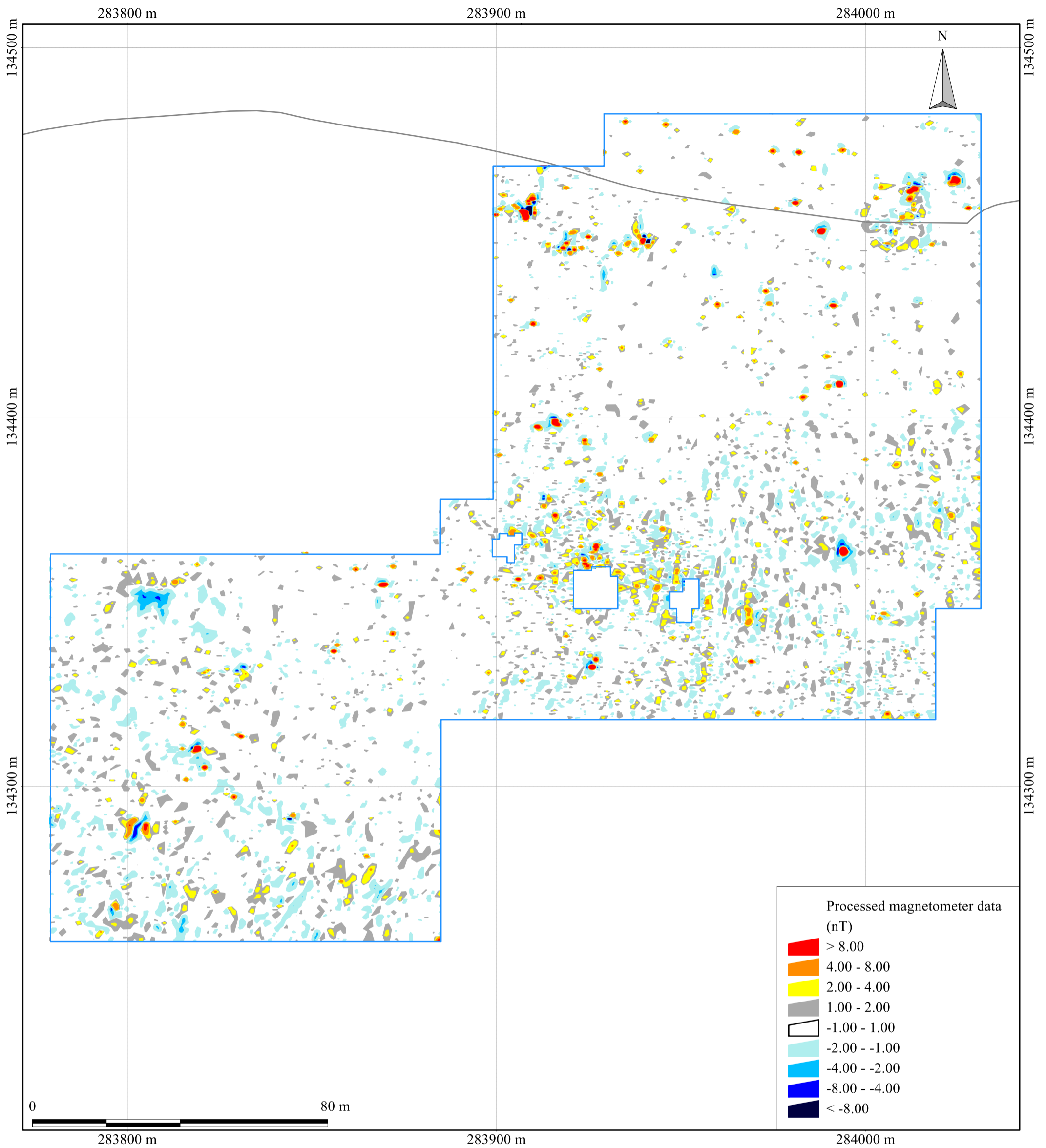
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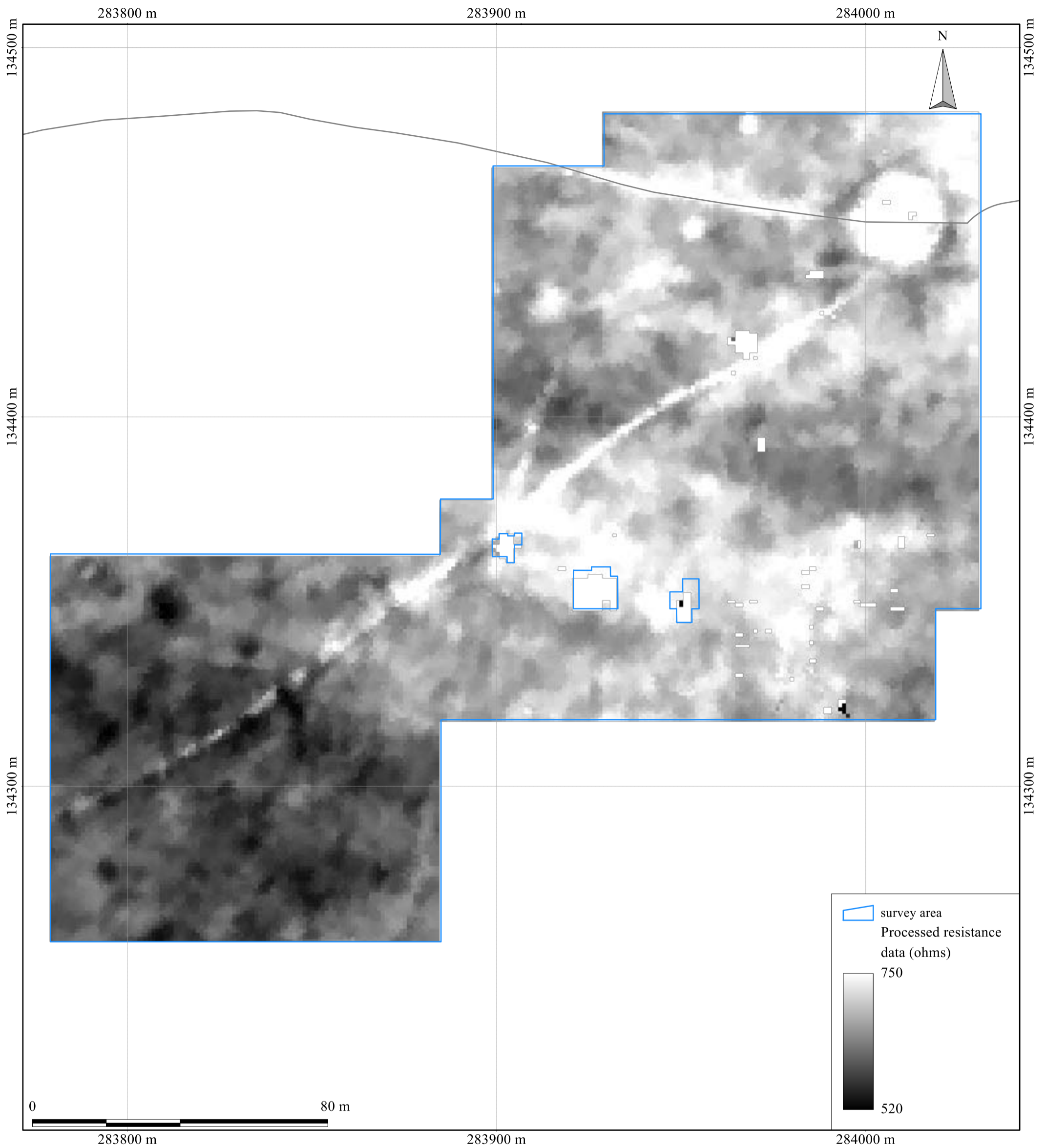
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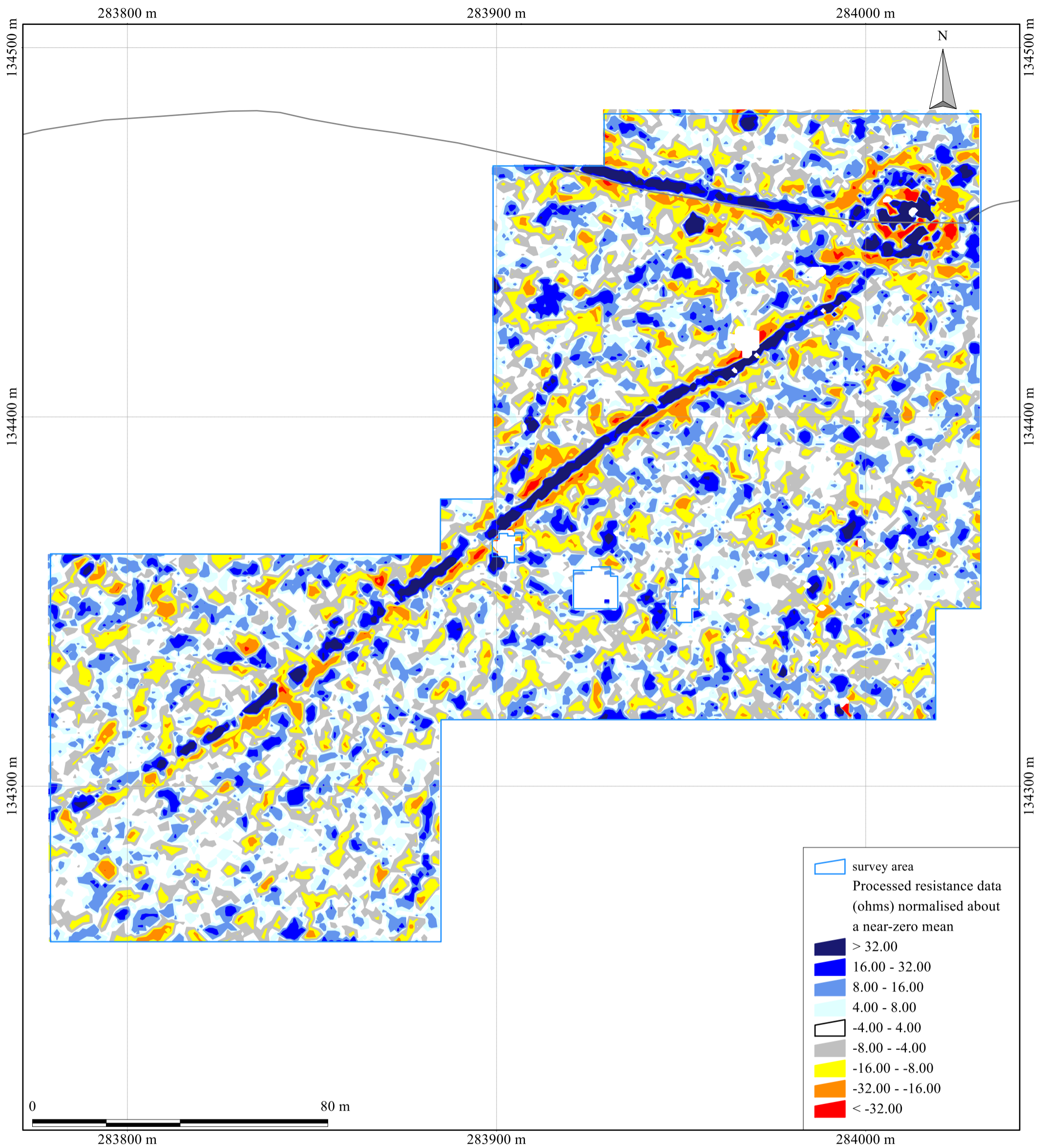
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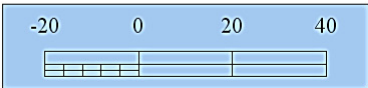
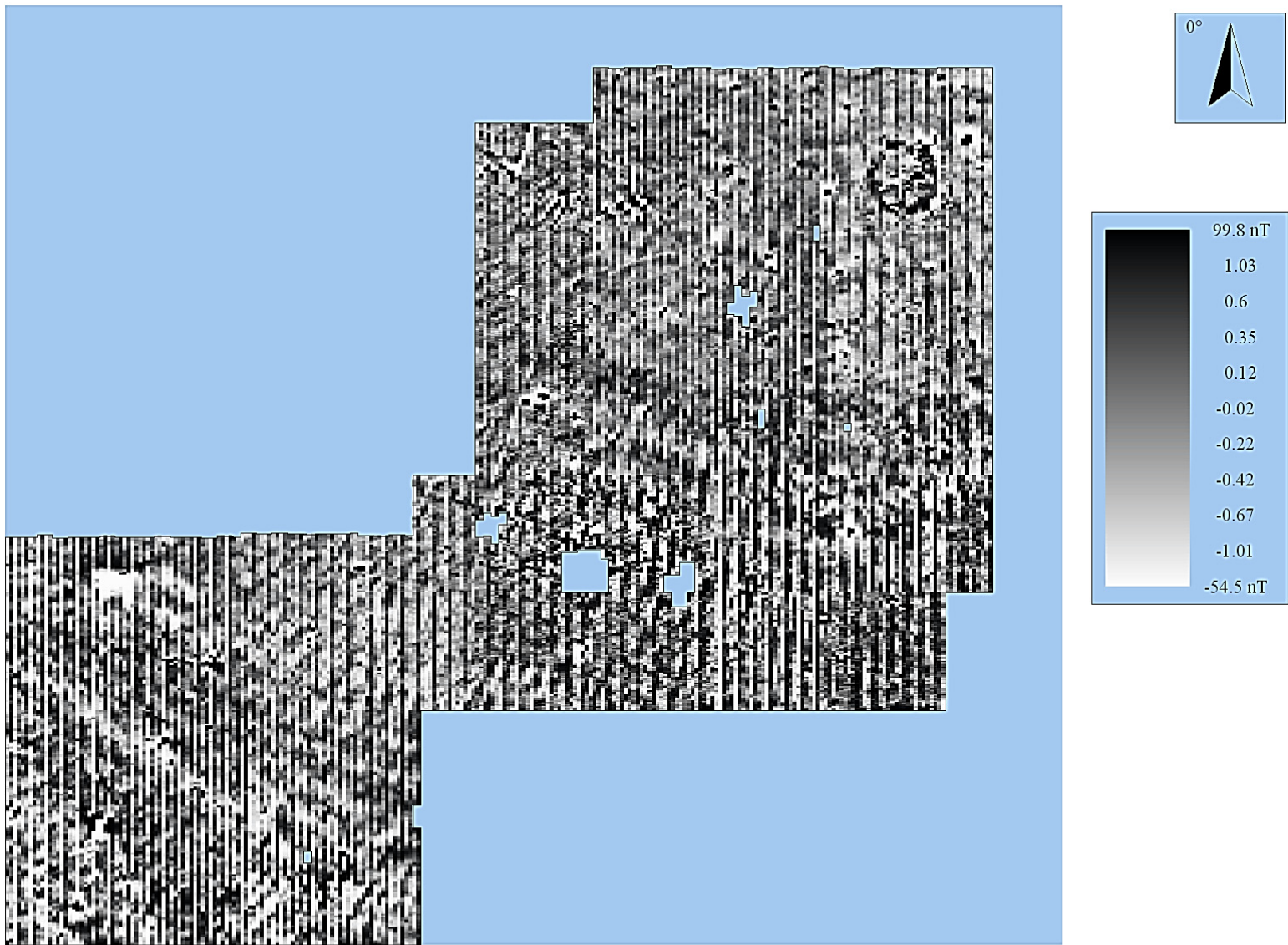
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An archaeological magnetometer and resistance survey
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Figure 10: shade plot of processed resistance data

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Instrument Type: Bartington Grad 601
 Units: nT
 Direction of 1st Traverse: 0 deg
 Collection Method: ZigZag
 Sensors: 2 @ 0.00 m spacing.
 Dummy Value: 32702

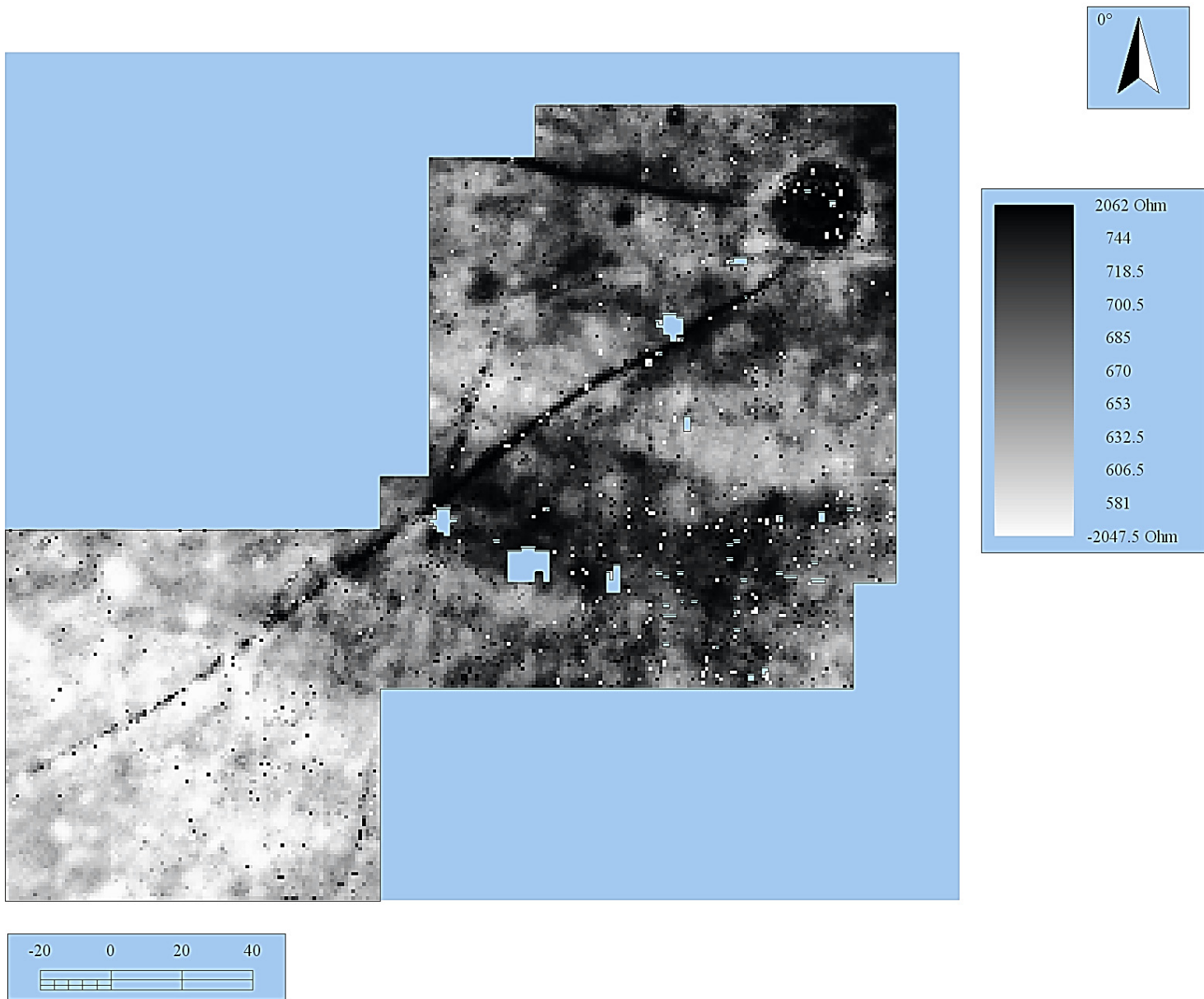
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 1 Base Layer

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 Y Interval: 1 m

Stats
 Max: 99.80
 Min: -54.50
 Std Dev: 1.28
 Mean: 0.00
 Median: -0.03

PROGRAM
 Name: TerraSurveyor
 Version: 3.0.31.0

Figure 12: shade plot of unprocessed magnetometer data



Instrument Type: GeoScan (Resistance)
 Units: Ohm
 Direction of 1st Traverse: 0 deg
 Collection Method: ZigZag
 Sensors: 1
 Dummy Value: 32702

Processes: 1
 1 Base Layer

Dimensions
 Grid Size: 30 m x 30 m
 X Interval: 1 m
 Y Interval: 1 m

Stats
 Max: 2062.00
 Min: -2047.50
 Std Dev: 115.56
 Mean: 668.84
 Median: 670.00

PROGRAM
 Name: TerraSurveyor
 Version: 3.0.31.0

Figure 13: shade plot of unprocessed resistance data

Appendix 2 Tables

Site: An archaeological magnetometer and resistance survey
 Withypool Hill, Withypool, Exmoor National Park
 Centred on NGR (E/N) 283906,134371
 Report: 1612WIT-R-1

anomaly group	associated anomalies	anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments	supporting evidence
m1		possible, high positive	sub-circular	possible heated deposits - may be associated with a cairn	two similar anomaly groups coincide with one mapped cairn; this group may represent a cairn	
m2		possible, high positive	sub-circular	possible heated deposits - may be associated with a cairn	two similar anomaly groups coincide with one mapped cairn; this group may represent a cairn	
m3		possible, enhanced	irregular	disturbed ground with ferrous elements	anomaly group may represent disturbed ground, possibly associated with a nearby mound that may be ground works from WW2 training activities	HER MM03191 small mound
m4		possible, enhanced	irregular	disturbed ground with ferrous elements	anomaly group may represent disturbed ground, possibly associated with a nearby mound that may be ground works from WW2 training activities	HER MM03191 small mound
m5		possible, enhanced	irregular	disturbed ground with ferrous elements	anomaly group may represent disturbed ground, possibly associated with a nearby mound that may be ground works from WW2 training activities	HER MM03191 small mound
m6		possible, north-south high low		in-situ highly heated deposits	anomaly group has characteristics often associated with in-situ high temperature heating such as cremations or metal smelting	
m7	r5	likely, positive	disrupted sub-circular	barrow ditch deposits	anomaly group coincides with and represents deposits from a bowl barrow recorded in the HER	HER MSO8683 A bowl barrow on Withypool Hill
m8	r10	possible, positive/negative/positive	linear	trench - possible robber trench or drain		HER MSO8683 A bowl barrow on Withypool Hill
m9		possible, enhanced	irregular	disturbed ground	anomaly group may represent relatively recent disturbance such as WW2 training damage or past a mature excavation	HER MMO3191 small mound possibly associated with WW2 training
m10		possible, enhanced	irregular	disturbed ground	anomaly group may represent relatively recent disturbance such as WW2 training damage or construction damage from a modern cairn built on the eastern side of the barrow	HER MMO3191 small mound possibly associated with WW2 training
m11		possible, negative	disrupted curvilinear	barrow deposits?	anomaly group coincides with a bowl barrow recorded in the HER and may represent this or may be a negative 'shadow anomaly' associated with the adjacent magnetic anomaly groups	HER MSO8683 A bowl barrow on Withypool Hill
m12		possible, north-south high low		in-situ highly heated deposits	anomaly group has characteristics often associated with in-situ high temperature heating such as cremations or metal smelting	
m13		possible, high positive	sub-circular	possible heated deposits - may be associated with a cairn	two similar anomaly groups coincide with one mapped cairn; this group may represent a cairn	
m14		possible, high positive	sub-circular	possible heated deposits - may be associated with a cairn	two similar anomaly groups coincide with one mapped cairn; this group may represent a cairn	
m15		possible, high positive	sub-circular	possible heated deposits - may be associated with a cairn	two similar anomaly groups coincide with one mapped cairn; this group may represent a cairn	
m16		possible, high positive	sub-circular	possible heated deposits - may be associated with a cairn	two similar anomaly groups coincide with one mapped cairn; this group may represent a cairn	
m17		possible, high positive	sub-circular	possible heated deposits - may be associated with a cairn	two similar anomaly groups coincide with one mapped cairn; this group may represent a cairn	
m18		possible, high positive	sub-circular	possible heated deposits - may be associated with a cairn	two similar anomaly groups coincide with one mapped cairn; this group may represent a cairn	
m19	r18	possible, high positive	sub-circular	possible heated deposits; possible cairn deposits	anomaly group is one of two coinciding with one mapped cairn	MSO8756 prehistoric cairn visible as a turf covered stony mound
m20		possible, high positive	sub-circular	possible heated deposits; possible cairn deposits	anomaly group is one of two coinciding with one mapped cairn	MSO8756 prehistoric cairn visible as a turf covered stony mound
m21		possible, enhanced	irregular	disturbed deposits - archaeological or natural		
m22		possible, positive	oval	pit?		
m23		possible, positive	curvilinear			
m24		possible, enhanced	irregular	disturbed deposits - archaeological or natural		
m25		possible, high positive	sub-circular	possible heated deposits - may be associated with a cairn	two similar anomaly groups coincide with one mapped cairn; this group may represent a cairn	
m26	two groups	possible, high positive	sub-circular	possible heated deposits - may be associated with a cairn	two similar anomaly groups coincide with one mapped cairn; this group may represent a cairn or possibly two adjacent cairns	
		possible, negative shadow	partial sub-circular	stony deposits or 'shadow anomaly'	anomaly group may represent cairn deposits or be a 'shadow anomaly' associated with the adjacent positive anomaly group and not related to ground deposits	
m27		possible, enhanced	irregular	disturbed deposits - archaeological or natural		
m28		possible, high positive	sub-circular	cairn deposits?	anomaly groups are similar in pattern to others attributed to cairns but the magnitude of response is lower	
m29		possible, high positive	sub-circular	cairn deposits?	anomaly groups are similar in pattern to others attributed to cairns but the magnitude of response is lower	
m30		possible, positive	double linear	archaeological deposit or disturbance along the line of a footpath		
m31		possible, positive	linear group of ovals	linear group of pits?	anomaly group is highlighted because it is clear in the dataset, may form a linear feature and is in close proximity to the stone circle	MSO8682 The remains of a stone circle on the southwest slope of Withypool Hill.
m32		possible, positive	oval	pit?		
m33		possible, positive	oval	pit?	anomaly group is highlighted because it is clear in the dataset and is in close proximity to the stone circle	MSO8682 The remains of a stone circle on the southwest slope of Withypool Hill.
m34		possible, positive	oval	pit?	anomaly group is highlighted because it is clear in the dataset and is in close proximity to the stone circle	MSO8682 The remains of a stone circle on the southwest slope of Withypool Hill.
m35		likely, high positive	oval	cairn deposits	anomaly group coincides with a cairn mapped near the centre of Whithypool stone circle	MSO8682 The remains of a stone circle on the southwest slope of Withypool Hill.
m36		possible, positive	oval	pit?	anomaly group is highlighted because it is clear in the dataset and is in close proximity to the stone circle	MSO8682 The remains of a stone circle on the southwest slope of Withypool Hill.
m37		possible, north-south high low		in-situ highly heated deposits	anomaly group has characteristics often associated with in-situ high temperature heating such as cremations or metal smelting although in this case the group coincides with disrupted topsoil and may represent a ferrous material such as a horse shoe	
m38		possible, north-south high low		in-situ highly heated deposits	anomaly group has characteristics often associated with in-situ high temperature heating such as cremations or metal smelting although in this case the group coincides with disrupted topsoil and may represent a	
m39		possible, positive	oval	pit?	anomaly group is highlighted because it is clear in the dataset and is in close proximity to the stone circle	MSO8682 The remains of a stone circle on the southwest slope of Withypool Hill.
m40		possible, positive	oval	pit?	anomaly group is highlighted because it is clear in the dataset and is in close proximity to the stone circle	MSO8682 The remains of a stone circle on the southwest slope of Withypool Hill.
m41		possible, enhanced	irregular	disturbed deposits - archaeological or natural		
n/a		possible, dipole		ferrous material	anomaly group probably represents a quite recent iron or steel object; included in the analysis to avoid	

Table 1: magnetometer data analysis

Site: An archaeological magnetometer and resistance survey
 Withypool Hill, Withypool, Exmoor National Park
 Centred on NGR (E/N) 283906,134371
 Report: 1612WIT-R-1

anomaly group	associated anomalies	anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments	supporting evidence
r1	two groups	possible, high	sub-circular	mound deposits	anomaly group may represent a mound that may be associated with WW2 activities	MMO3191 small mound
r2	two groups	possible, low	disrupted sub-circular	mound deposits	anomaly group may represent a mound that may be associated with WW2 activities	MMO3191 small mound
r3	two groups	possible, high	sub-circular	mound deposits	anomaly group may represent a mound that may be associated with WW2 activities	MMO3191 small mound
r4	two groups	possible, low	disrupted sub-circular	mound deposits	anomaly group may represent a mound that may be associated with WW2 activities	MMO3191 small mound
r5		likely, low	disrupted sub-circular	deposits associated with bowl barrow	anomaly group coincides with a bowl barrow recorded in the HER	MSO8683 A bowl barrow on Withypool Hill
r6		possible, low spread	linear	possible robber or excavation trenches	anomaly group coincides with a bowl barrow recorded in the HER; the pattern of this anomaly group implies a later linear disruption of the surrounding deposits and in-fill with relatively less stony deposits	MSO8683 A bowl barrow on Withypool Hill
r7	m7	likely, high	disrupted sub-circular	deposits associated with bowl barrow	anomaly group coincides with a bowl barrow recorded in the HER	MSO8683 A bowl barrow on Withypool Hill
r8		likely, low		deposits associated with bowl barrow	anomaly group coincides with a bowl barrow recorded in the HER	MSO8683 A bowl barrow on Withypool Hill
r9		likely, low		deposits associated with bowl barrow	anomaly group coincides with a bowl barrow recorded in the HER	MSO8683 A bowl barrow on Withypool Hill
r10		possible, low spread	linear	possible robber or excavation trenches	anomaly group coincides with a bowl barrow recorded in the HER; the pattern of this anomaly group implies a later linear disruption of the surrounding deposits and in-fill with relatively less stony deposits	MSO8683 A bowl barrow on Withypool Hill
r11		possible, high spread	irregular	deposits associated with bowl barrow; may be disturbed or dumped	anomaly group coincides with a bowl barrow recorded in the HER	MSO8683 A bowl barrow on Withypool Hill
r12	m8	possible, low spread	linear	possible robber or excavation trenches	anomaly group coincides with a bowl barrow recorded in the HER; the pattern of this anomaly group implies a later linear disruption of the surrounding deposits and in-fill with relatively less stony deposits	MSO8683 A bowl barrow on Withypool Hill
r13		possible, high spread	irregular	irregular	anomaly group coincides with a bowl barrow recorded in the HER; anomaly group is likely to reflect stony deposits from a recent cairn	surveyor observation
r14		possible, low spread	linear	possible robber or excavation trenches	anomaly group coincides with a bowl barrow recorded in the HER; the pattern of this anomaly group implies a later linear disruption of the surrounding deposits and in-fill with relatively less stony deposits	MSO8683 A bowl barrow on Withypool Hill
r15		possible, high spread	linear	deposits associated with bowl barrow; may be disturbed or dumped	anomaly group coincides with a bowl barrow recorded in the HER	MSO8683 A bowl barrow on Withypool Hill
r16		possible, low		deposits associated with bowl barrow	anomaly group coincides with a bowl barrow recorded in the HER	MSO8683 A bowl barrow on Withypool Hill
r17		possible, low	disrupted linear		anomaly group coincides with a bowl barrow recorded in the HER	MSO8683 A bowl barrow on Withypool Hill
r18	m19	possible, low	semi-circular		anomaly group may represent archaeological deposits or the apparent pattern may be coincidental	
r19		likely, high	sub-circular	cairn deposits	anomaly group coincides with and likely represents a mapped cairn	MSO8756 prehistoric cairn visible as a turf covered stony mound
r20		possible, low	semi-circular		anomaly group may represent archaeological deposits or the apparent pattern may be coincidental	
r21		possible, low	semi-circular		anomaly group may represent archaeological deposits or the apparent pattern may be coincidental	
r22		possible, low	disrupted linear & sub-circular	deposits associated with modern footpath	anomaly group aligns with the modern footpath around Withypool stone circle but does not exactly coincide	MSO8682 The remains of a stone circle on the southwest slope of Withypool Hill
r101		possible, linear trends		former routeway or modern footpath		
r102		likely, high well defined parallel linears		modern footpath		
r103		likely, high well defined parallel linears		modern footpath		

Table 2: resistance data analysis

<p>Documents Survey method statements: Dean (2016 a and b)</p>	
<p>Methodology</p> <ol style="list-style-type: none"> 1. The work was undertaken in accordance with the survey methodology statement. The magnetometer (gradiometer) and resistance surveys were undertaken with reference to standard guidance provided by the Chartered Institute for Archaeologists (2014) and Archaeology Data Service/Digital Antiquity Guides (undated). 2. The survey grid location information and grid plan was recorded as part of the project in a suitable GIS system. 3. Data processing was undertaken using appropriate software, with all anomalies being digitised and geo-referenced. The final report included a graphical and textual account of the techniques undertaken, the data obtained and an archaeological interpretation of that data and conclusions about any likely archaeology. 	
<p>Grid <i>Method of Fixing:</i> DGPS set-out using pre-planned survey grids and Ordnance Survey coordinates. <i>Composition:</i> 30m by 30m grids <i>Recording:</i> Geo-referenced and recorded using digital map tiles. <i>DGPS used:</i> Spectra Precision PM5V2 GPS with external antenna and survey pole and DigiTerra Explorer 7 as the survey control program.</p>	
<p>Magnetometer Equipment <i>Instrument:</i> Bartington Instruments grad601-2 <i>Firmware:</i> version 6.1</p>	<p>Magnetometer Data Capture <i>Sample Interval:</i> 0.125 metres <i>Traverse Interval:</i> 1 metre <i>Data capture:</i> automatic data logger <i>Traverse Method:</i> zigzag <i>Traverse Orientation:</i> GN</p>
<p>Resistance Equipment <i>Instrument:</i> Geoscan Research RM15 multi-probe resistance meter <i>Configuration:</i> twin probe <i>Mobile probe spacing:</i> 0.5-metres</p>	<p>Resistance Data Capture <i>Sample Interval:</i> 1 metre <i>Traverse Interval:</i> 1 metre <i>Data capture:</i> automatic data logger <i>Traverse Method:</i> zigzag <i>Traverse Orientation:</i> GN</p>
<p>Data Processing, Analysis and Presentation Software IntelliCAD Technology Consortium IntelliCAD 7.2 DW Consulting TerraSurveyor3 Manifold System 8 GIS Microsoft Corp. Office Excel 2013 Microsoft Corp. Office Publisher 2013 Adobe Systems Inc Adobe Acrobat 9 Pro Extended</p>	

Table 3: methodology summary

Instrument Type:	Bartington Grad-601 gradiometer	
Units:	nT	
Direction of 1st Traverse:	see below	
Collection Method:	ZigZag	
Sensors:	2 @ 1.00 m spacing.	
Dummy Value:	32702	
PROGRAM		
Name:	TerraSurveyor	
Version:	3.0.31.0	
Stats		Processes: 5
Max:	102.00	1 Base Layer
Min:	-60.18	2 DeStripe Median Sensors: Grids: All
Std Dev:	1.12	3 De Stagger: Grids: b1.xgd b8.xgd b9.xgd b15.xgd b2.xgd b7.xgd b10.xgd b14.xgd b3.xgd b6.xgd b11.xgd b13.xgd b4.xgd b5.xgd b12.xgd c1.xgd Mode: Both By: 2 intervals
Mean:	0.06	4 De Stagger: Grids: c6.xgd c7.xgd b16.xgd c9.xgd c5.xgd c8.xgd b17.xgd b18.xgd c10.xgd c4.xgd a1.xgd a8.xgd a9.xgd a16.xgd Mode: Both By: 2 intervals
Median:	0.01	5 Interpolate: Match X & Y Doubled.

Table 4: processed data metadata, magnetometer survey

Instrument Type:	Geoscan Research RM15	
Units:	resistance data (ohms) normalised about a near-zero mean	
Direction of 1st Traverse:	0 deg	
Collection Method:	ZigZag	
Sensors:	2 @ 1.00 m spacing.	
Dummy Value:	32702	
PROGRAM		
Name:	TerraSurveyor	
Version:	3.0.25.0	
Figures 8 and 9		
Stats		Processes: 5
Max:	1200.00	1 Base Layer
Min:	520.00	2 Despike Threshold: 1 Window size: 3x3
Std Dev:	62.83	3 Despike Threshold: 1 Window size: 3x3
Mean:	666.47	4 Despike Threshold: 1 Window size: 3x3
Median:	670.00	5 Clip from 520.00 to 1200.00 Ohm
Figures 10 and 11		
Stats		Processes: 8
Max:	70.20	1 Base Layer
Min:	-70.09	2 Despike Threshold: 1 Window size: 3x3
Std Dev:	13.06	3 Despike Threshold: 1 Window size: 3x3
Mean:	-0.02	4 Despike Threshold: 1 Window size: 3x3
Median:	-0.45	5 Clip from 520.00 to 1200.00 Ohm
		6 High pass Gaussian filter: Window: 10 x 10
		7 Interpolate: X & Y Doubled.
		8 Clip at 5.00 SD

Table 5: processed data metadata, resistance survey

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