

Geophysical Survey Report

Kellystown Windfarm,

Co. Louth

Detection Device Number: 25R0179

Donald Murphy
May 2025
Report Status: Final

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PROJECT DETAILS

Project	Kellystown Windfarm Co. Louth
Report Type	Geophysical Survey report
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Townland(s)	Drumshallon, Gallstown, Kearneystown, Stonehouse, Swinestown and Piperstown
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VERSION CONTROL

Revision	Date	Description	Status	Author	Reviewed	Approved
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NON-TECHNICAL SUMMARY

This report details the results of a Geophysical Survey carried out at Kellystown Windfarm, Co. Louth (ITM 707980, 783365). The geophysical survey was carried out in response to a further information request attached to planning Ref. No. 2460766 by Louth County Council. The site is located 8.3km north of Drogheda in the townlands of Drumshallon, Gallstown, Kearneystown, Stonehouse, Swinestown and Piperstown. It primarily consists of pasture fields.

The survey area contains one monument as listed in the *Record of Monuments and Places (RMP)* or *Sites and Monuments Record (SMR)*. LH021-014---- is a standing stone in the townland of Drumshallon. There are no Protected Structures, as listed in the *Louth County Development Plan 2021-2027*, nor sites listed in the *National Inventory of Architectural Heritage (NIAH)*. The nearest such sites are Piperstown House (RPS ID. LHS021-015; NIAH Reg. No. 13902112) located 100m to the south, Cartanstown House (NIAH 13902111) located 430m west, and Stonehouse Estate (NIAH Ref: 13902110) located c. 550m west of the site. Cartographical sources and aerial imagery were examined as part of the assessment of the site. No features or anomalies of archaeological significance were noted.

The geophysical survey was conducted by Donald Murphy, Robert Breen, and Jeanne Rochford of Archaeological Consultancy Services Unit Ltd. (ACSU) under licence 25R0179, issued by the Department of Housing, Local Government, and Heritage. A full, detailed gradiometer survey was undertaken throughout the application area using a SENSYS MAGNETO MXV3 8-sensor fluxgate gradiometer cart system.

The survey identified potential archaeological features within Fields 9 and 16 that consist of a series of curvilinear features (**M1 – M2**) that may represent the remains of enclosures. Scatters of other anomalies are also labelled as potential archaeology (?Archaeology). These include a concentration of anomalies; curvilinear and linear responses, and small responses that could represent archaeological features such as pits, postholes, spreads and kilns, but could also be of a natural origin.

Features depicted on the examined Ordnance Survey mapping were also detected, including linear anomalies corresponding with former field boundaries. Linear anomalies that are not recorded field boundaries were also detected, and they likely represent pre-OS field systems, drains or paths/access routes.

It is recommended that:

- Anomalies identified are targeted during a test trenching programme, in particular the potential enclosure sites (**M1** and **M2**), linear features, curvilinear features, field systems, pits, spreads and any features of archaeological significance and potential. Any identified features shall be sufficiently

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sectioned to assess their depth, nature and archaeological potential. Following the test trenching, the National Monuments Service should be consulted to agree on an appropriate mitigation strategy for the development of the site.

- If preservation *in situ* is not an option in some areas and any archaeological features will be directly impacted by the proposed development, preservation by record (full excavation) is recommended.
- In addition, a 20m buffer or exclusion zone should be set up around the Recorded Monument LH021-014- Standing stone in the townland of Drumshallon. This exclusion zone will be established prior to the construction phase to highlight the archaeologically sensitive area surrounding the recorded monument and ensure that no excavation or other temporary works take place at this location. Prior to construction commencing, a temporary protective fence should be erected on site and should remain for the duration of the proposed construction works. The exclusion zones should not be used for the storage of construction material or plant.
- All further groundworks within the proposed development site should also be monitored, and any further archaeological features identified should be preserved *in situ* or by record (excavation) in consultation with the National Monuments Service.

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1. INTRODUCTION

This report details the results of a Geophysical Survey carried out at Kellystown, Co. Louth (ITM 707980, 783365; Figures 1–2). The site is located 8.3km north of Drogheda in the townlands of Drumshallon, Galistown, Kearneystown, Stonehouse, Swinestown and Piperstown. The survey was limited to the pasture fields as forested areas or fields under crop or scrub were deemed unsuitable.

The geophysical survey was carried out in response to a request for further information, which is attached to Planning Ref. No. 2460766 by Louth County Council.

The survey area contains one monument, which is listed in the *Record of Monuments and Places (RMP)* or *Sites and Monuments Record (SMR)*. LH021-014 is a standing stone in the townland of Drumshallon. There are no Protected Structures, as listed in the *Louth County Development Plan 2021-2027*, nor sites listed in the *National Inventory of Architectural Heritage (NIAH)*.

A detailed gradiometer survey was undertaken throughout suitable portions of the application area using a SENSYS MAGNETO MXV3 8-sensor fluxgate gradiometer cart system. The geophysical survey was conducted by Donald Murphy, Robert Breen, and Jeanne Rochford of Archaeological Consultancy Services Unit Ltd. (ACSU) under licence 25R0179, issued by the Department of Housing, Local Government, and Heritage

2. METHODOLOGY

The detailed magnetic survey was carried out using a SENSYS MAGNETO® MXV3 modular carrier that is configured to host 8 Sensys FGM650/3 sensors spaced at 0.5m intervals with a total survey width of 4m. The non-magnetic cart system is towed behind a quad bike, and readings are recorded at 200Hz. Data is captured every 20mm with a position accuracy of ± 1 cm using a Trimble R10 RTK GNSS receiver mounted on the cart at a height of 1.5m. All data is recorded with SENSYS software MonMX v.5.01 on a Panasonic FZ-G1 TOUGH PAD tablet computer in .cfg format.

Data is collected along parallel survey transects using the digital display system in MonMX, which provides a live stream of visual data. This allows for an accurate systematic survey without the need to establish pre-determined grids. Magnetic data is exported from the MonMX software in ASCII format and is imported to DW Consulting's TerraSurveyor64 v4.1.12.1 for processing. The data is initially de-striped (zero median traverse) and then clipped to a range of -1.5nT – +3nT. A TIF file is produced by TerraSurveyor software along with a corresponding world file (.TFW), which allows for automatic georeferencing when using CAD software. Raster images are georeferenced in ProgeCAD 2018 before being interpreted in AutoCAD LT 2025. Graphical

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interpretations that indicate anomalies identified are numbered so that they can be referenced in the survey results section of the geophysical survey report.

All work was carried out in accordance with the *IAI Code of Professional Conduct* (Institute of Archaeologists of Ireland 2006) and in accordance with the *EAC Guidelines for the use of Geophysics in Archaeology* (Schmidt et al. 2016), as well as English Heritage's *Geophysical Survey In Archaeological Field Evaluation* (David et al. 2008).

3. SURVEY OBJECTIVES

The survey aimed to establish the presence of any potentially existing but previously unknown monuments and any other archaeological features within the site and to inform a future programme of test trenching.

4. SOILS, GEOLOGY AND TOPOGRAPHY

The survey area consisted of a proposed 25 fields. However, only some fields were found suitable to survey at present, which included: Fields 1 – 5, the southeastern portion of Field 7, Field 8, the eastern portion of Field 9, and Fields 16-21. The remaining fields cannot be surveyed as they are either within forestry (the western portion of Field 7 and the southeast corner of Field 8, Field 22 and Field 23), under crop (Fields 6, 10-15 and 24-25) and furze (Field 9).

The site has an elevation of 88-118m Ordnance Datum (OD). The underlying geology consists of thickly bedded calcareous greywacke and is part of the Clogherhead Formation (Geological Survey Ireland). This bedrock geology is overlaid by soil derived from Lower Palaeozoic sandstone and shale. Bedrock is recorded in the areas surrounding the Kilsaran Gallstown Quarry. The soil groups consist mainly of surface and ground water gleys. (Teagasc Soil Guide).

5. ARCHAEOLOGICAL ASSESSMENT

5.1 Archaeological & Historical Background

There is no evidence for human activity within the footprint of the development from the early prehistoric periods (Mesolithic – 7000- 4000 BC; Neolithic 4000- 2400 BC). The nearest evidence to the project comes

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from an excavated multi-period site at Waterunder, Mell, Co. Louth (Licence No. 05E0072), which returned dates from the early Neolithic period, Bronze Age and Iron Age dates, although well outside of the survey area. It should also be noted that the southwestern portion of the site is located c 12.5km to the northeast of the World Heritage Site of *Brú na Bóinne*, and 7.6km north of the associated Buffer Zone. This landscape is of high cultural significance, being part of the Neolithic passage tomb complex which includes the sites of Newgrange, Knowth and Dowth.

The earliest archaeological evidence within the site appears to date to the Bronze Age (2400- 500 BC). As the name suggests, this period saw the introduction of metalworking in Ireland, with the alloyed metal of copper and tin bringing a new assemblage of artefacts to the archaeological record. New monument types also appear in this period, including standing stones, new burial practices such as the cist burial, and the most common type of field monument from this period, the burnt mound (otherwise known as *Fulachta Fiadh*).

Within the Boyne Valley, embanked enclosures were constructed close to passage tombs (Stout and Holloway, 1991). Around the town of Drogheda, ring barrows were constructed with urn-burials inserted in the centres of the barrows. At Tullyallen Co. Louth, a ring barrow with central urn-burial was excavated in 2000 (Chappel, 2002). Another example of such a barrow was one excavated by Derek Gallagher in 2019 in the townland of Yellowbatter, Drogheda, Co. Louth. The ring ditch measured c. 8.3m in diameter by a maximum 1.04m depth. Two cremations located roughly in the centre of the ring ditch were contained within funerary vessels. The site also produced a further eighty-five sherds of pottery, representing at least four Late Bronze Age pots (Gallagher and Gibney, 2020).

Standing stones are purposefully placed megaliths that served a variety of functions in the prehistoric period. Some function as burial, territorial or commemorative markers. Others are grouped together in pairs or rows, which is thought to be associated with astronomical alignments. Due to their nature, precise dating of these features often relies on additional contexts, such as an associated burial. A single standing stone, LH021-014- --- is situated within the site boundary at Drumshallon (See below).

Burnt mounds are the most common archaeological feature uncovered in Ireland. They are also known as *fulacht fiadh*, which can be roughly translated to 'meat cooking place'. Over 4,500 examples were recorded in 1997, primarily by the Archaeological Survey of Ireland. However, by 2007 this had increased to over 7,000 examples (Grogan et al, 2007), many of which had been identified as a result of extensive survey work and excavation in advance of developments. Burnt mounds are usually located where there is a readily available water source, often near a river, stream or wetland fringes. They are primarily identified as heat-shattered stones in charcoal-rich mounds or spreads; however, in many cases, the sites have been disturbed by later

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agricultural activity, particularly ploughing, and are no longer visible on the field surface. Disturbed spreads will nonetheless often preserve the underlying associated features, such as troughs, pits and gullies. Burnt mound sites are most commonly dated to the Bronze Age, often to the Middle/Late Bronze Age, although there are also an increasing number of sites dated to the Neolithic, Chalcolithic and Iron Age (Brindley et al, 1989–90; Corlett, 1997; Hawkes, 2018).

Excavations have demonstrated the complexity and varying morphology of these sites, which, as detailed by Hawkes (2018), represent a wide range of site types, some of which employ different pyrolithic applications. The basic principle of pyrolithic technology involves transferring heat using hot stones, and where a trough/pit is present, it is likely that this involved the boiling or heating of water. In contrast, some other pit features may suggest that roasting, steaming, baking and steam bathing also took place (ibid., 53). O’Kelly (1954) and Lawless (1990) both demonstrated how meat could be cooked in troughs of boiling water, using hot stones to heat the water. A bathing or sauna function has also been suggested as an alternative (Lucas, 1965; Barfield and Hodder, 1987). A more recent demonstration by Quinn and Moore (2007) showed that troughs could also have been used for brewing. This theory has, however, been criticised due to the absence of cereal remains from most burnt mound sites (McClatchie et al, 2007). Given their plentiful nature, it is perhaps best to see them simply as water heating sites, with as many possible uses for the hot water as we have today. Thus, a specific function will largely depend on the environmental samples taken, any finds retrieved, and the morphology of the features uncovered in relation to the burnt mound. In addition, fulacht fiadh/burnt mounds are also a reflection of prehistoric activity in general and often suggest the presence of settlements in the nearby vicinity, usually in a drier location.

Managing water at burnt mounds was also important and this was often achieved through features such as overflow channels, which allowed excess water to be directed away from a trough and working area, and inlet channels, which connected a trough or pit to a supply of water, with the latter sometimes found in association with springs, deep pits and wells (Hawkes, 2018). The latter usually helped to supply water either from a natural spring, a nearby river/stream or by using the fall of a slope to collect rainwater, with just six examples identified by Hawkes (ibid).

Evidence for early medieval activity within the area is also found in the form of a ringfort (LH021-016001) and three souterrains (LH021-016002, LH018-043 and LH021-023). Ringforts, as the name suggests, imply a circular enclosure with a minimum of one ditch and possibly accompanying banks. They were generally circular, measuring c. 24–60 metres in diameter. Early Irish laws stated that circularity was a feature of the model ringfort (Stout 1997). However, more non-circular enclosures have also come to light with an increase in

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development-led excavations, largely between 50m and 70 metres in diameter. For this discussion, therefore, all ringforts and enclosures will be discussed under the category 'ditched enclosures'.

The majority of early medieval ditched enclosures date to the sixth to ninth centuries AD, and we see a significant decline in their use in the tenth century (O'Sullivan and Nicholl 2010). Though a site in Laytown, Co. Meath could have a fourth-century date (McConway, 2002), other sites such as Ballynacarriga, Co. Cork (Noonan 2004) and Raystown, Co. Meath (Seaver 2005), were probably occupied from the fifth century well into the eleventh century.

Ditched enclosures are generally regarded as enclosed farmsteads, and at some sites, at least, the defences are thought to have been built to protect against cattle raids (Stout 1997). Some sites have provided little evidence for structures, suggesting the enclosure was used for storing cattle, known as a 'bodun', though the majority provide evidence to suggest they were inhabited settlements, with houses, farmyards, outbuildings and animals (O'Sullivan and Nicholl 2010). Excavated items retrieved from ringforts are largely of a domestic, craft or agricultural nature, with the ditches sometimes allowed to naturally silt up, but at other times they were filled with dumped refuse (Monk 1995). Layers of slag were dumped into the ditch at Lisleagh, Co. Cork, for example (ibid.). Some larger sites, such as Raystown, Co. Meath, fulfilled many functions, such as providing evidence for animal husbandry, cereal and grain processing, milling, burial and metalworking (Seaver 2016). Evidence from excavations shows that enclosing ditches were, in some cases, allowed to silt up and had refuse deliberately dumped into them.

Ditched enclosures are the commonest field monuments in Ireland. The majority of ditched enclosures were univallate with one bank and fosse. In many cases, the banks do not survive. There are also bivallate enclosures, for example, Cloonaboy, Co. Mayo (Gillespie and Kerrigan 2010), and multivallate enclosures, such as Garranes, Co. Cork (Ó Ríordáin 1942). Ditched enclosures tend to be situated on sloping or well-drained hilly ground with good views (Stout, 1997), and they are usually found in clusters within a townland (Edwards, 1990).

Ditched enclosures usually have an entrance at the southeast. This is to avoid the prevailing cold westerly and northerly winds that the enclosure would be exposed to (Stout 1997). The entrance passage at Rath II at Ballypalady, Co. Antrim, ranged from 0.76m at the outer end to 1.5m at the inner opening, suggesting it was not intended for keeping large livestock (O'Sullivan and Nicholl 2010). Many other sites, like at Lissachiggel, Co. Louth, had either cobbles or paving stones, providing a dry passage into the enclosure. These entrances were known in early Irish literature and legal sources as the 'airdrocht' and were to be kept clean and dry, with often observed ditches and gullies aiding such drainage (ibid.). It was also not unusual to see pathways laid

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within the interior, to steer movement in a particular direction and ‘upon entering the site, a person was often persuaded by laid pathways to move directly and immediately to the house doorway’ (ibid.).

Early medieval houses within ditched enclosures tended to be circular or round, and these would have been constructed of stone or post-and-wattle walls. The roofs were likely thatched with reeds, turf or straw. According to the eighth-century law text Críth Gablach, a typical farmer's house was 6–8 metres in diameter. Archaeological evidence shows that the majority were 4–5 metres in diameter, and some were significantly larger at 6–10 metres in diameter (O’Sullivan and Nicholl 2010). As pointed out by McCormick et al. (2011), because of the basket-like construction, any recuts or changes to these early medieval houses are rarely seen in the archaeological record. It was likely that the lifespan of a medieval house would have lasted for just a short period (20 to 30 years); however, with good maintenance, a house could have stood for 50 to 60 years (O’Sullivan and Nicholl 2010).

Associated with enclosures and often found in their environs are fire pits, storage pits, refuse pits, cooking pits and cereal-drying kilns. O’Sullivan and Nicholls (2010) wrote that pits are ‘one of the more enigmatic elements to be found within the enclosure...their function...difficult to discern. They would have been used for a variety of purposes; probably reused and cleaned out many times and countless, no doubt, had multiple functions over their lifetime’ (ibid.). According to McCormick et al. (2011), cereal-drying kilns are generally not associated with ditched enclosures. However, several examples have come to light since that study, such as at Johnstown 1, Co. Meath, Gortygrigane, Co. Tipperary and Camlin, Co. Tipperary.

Often associated with the ringforts are curvilinear field systems. At Cush, Co. Limerick, a line of rectangular fields was excavated by O Riordain (1940) that were located along the west-facing slopes of the Slieve Reagh hillside, with many of the field boundaries respecting the ringfort ditches. The field enclosures are generally long and thin, and run down the hillslope, while those at the northern end appear square in plan.

Excavations at Lough Gur in Limerick, again by Ó Ríordáin (1949), uncovered field systems associated with hut sites known as the ‘Spectacles’. Each unenclosed house site was situated in a small rectangular field overlooking Lough Gur. The fields were only half an acre in size, and the field boundaries comprised double-stoned walls with rubble fills, ranging in width between 1m and 3m, except for one which was made from earth. Their proximity to the houses and small size suggest they were probably used for tillage. Another field bank was situated up the hillside and was probably part of a wider field system used for pasture (Ó Ríordáin 1949).

A field system of banks and ditches preceded the construction of ringforts I and II at Lisduggan North, Co Cork. Twohig (1990), however, suggested that the older linear trenches provided the building material for a series

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of contemporary field banks. A third ringfort, in proximity to the west of ringforts I and II, also postdated a series of linear banks and ditches, which were again probably utilised for the construction of the early medieval field banks. The building material was used in a series of banks which enclosed a range of fields on part of Knocknass Hill. The pattern of field systems at Lisduggan North was very irregular, and Twohig (1990) has suggested that they most clearly resemble the field systems uncovered at Cush, Co. Limerick.

At Ballyutoag, Co. Antrim, a group of curvilinear enclosures representing field systems was associated with three smaller curvilinear enclosures that enclosed a number of hut sites. The series of curvilinear fields (Williams 1984) covered an area of approximately twenty-four acres and were formed by low earthen banks. A group of fields to the west of Enclosure's I and II contained cultivation ridges. Ballyutoag was probably an upland transhumance settlement where cattle grazed for the summer months and small levels of crop husbandry were undertaken. Excavation of some of the hut sites produced a meagre collection of artefacts which ties in with the evidence from the historical sources stating that booleying was the work of the impoverished classes, mainly women and children (Patterson 1994). The finds and radiocarbon dates from the excavations confirm an early medieval date for the settlement and field systems (ibid).

A ringfort, associated with curvilinear field systems, was situated on the townland boundary between Glebe and Laughanstown, Co. Dublin. Two small ditches, radiating from the south of the enclosure, represented early medieval field enclosures. The ditches probably had low banks topped by hawthorn or blackthorn, and both species were represented in the charcoal samples. The curving hedgerow of the townland boundary complemented one of the field enclosures, suggesting a large, elongated field system attached to the south of the ringfort. Radiocarbon dates confirmed an early medieval date, between the seventh and ninth centuries, for one of the field boundaries (Seaver 2005).

The closest example of a similar site type excavated to date is the early medieval field complex at Boyerstown, Co. Meath, which was excavated in advance of the M3 motorway project. Here, five circular enclosures and an array of sub-rectangular and curvilinear enclosures were excavated. The earliest enclosure (60m x 30m) contained three internal divisions, and there were no internal features or finds, with the exception of small amounts of animal bone. One of the internal divisions cut an earlier ditch dated to AD 460-650, so Enclosure 1 post-dated this period. Enclosure 2 (45m x 25m), also sub-rectangular, cut through the S-SE extent of Enclosure 1 and was dated to AD 700-900. An annex was visible to the north and was dated to AD 630-780. Two additional radiocarbon dates were recovered from ditch features. One ran into/was cut by Enclosure 1 and was dated to AD 580-680, and a small curvilinear ditch, the function of which is not clear, was cut by Enclosure 2 and was dated to AD 620-700. It is likely to have been associated with Enclosure 1. It is likely that

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all features on this site represent successive phases of enclosure activity and were broadly contemporary. It is probable that all the ditches functioned as animal enclosures as there is an almost total absence of finds and only a small amount of animal bone was recovered. What appears to be a ringfort, based on the geophysical evidence, is located to the northwest of the field systems and is probably related to them.

The Boyerstown field systems display a range of rectangular, sub-rectangular and curvilinear fields. It is common to find ringforts, or open settlements, from the early medieval period associated with these types of fields (see examples above) but what is unusual about the Boyerstown evidence is that the clustering of fields occur away from the main settlement. The first and most difficult question that must be asked is what the field systems at Boyerstown were used for. Only a tiny number of artefacts, five knives, were uncovered from the ditches at Boyerstown. No evidence for plough marks, such as ridge or furrow, were detected on either site. Animal bone was retrieved only in tiny quantities at Boyerstown so what we are dealing with essentially are a number of successive field systems, annexes and ditches which have returned radiocarbon dates between AD 460 and AD 900. It appears most likely that the fields enclosed livestock and that although the radiocarbon dates for the majority of the features, including Enclosures' I and II, the annex to Enclosure II and the small curvilinear ditch that was cut by Enclosure II, demonstrate broad contemporaneity, the geophysical signatures suggest various phases mainly concentrated within a 200-year period between the seventh and eighth centuries. It, therefore, appears that the archaeological evidence at Boyerstown represents successive phases of land enclosure where the purpose was to enclose livestock. The lack of animal bone from the ditches is not surprising because the majority of animals were slaughtered within, or close, to the settlement during the early Middle Ages hence the common retrieval of large quantities of cattle, sheep and pig bone from the vast majority of ringfort enclosing ditches.

Evidence for later Medieval periods is found in the area of the proposed development in the form a deserted medieval settlement - LH021-027001, Motte LH021-027002 which date to at least the 13th century (While the Motte may have a late 12th century date). This period is associated with the arrival of the Anglo-Normans. This period saw the establishment of towns and villages, many of which still share a connection to the original placenames. Stone built castles begin to appear in the Irish landscape, as well as tower-houses and an increase in stone-built churches and associated burial sites. These types of sites are found mostly to the northern part of site of the proposed development.

The following post-medieval period (after 1550 to the mid-19th century) saw many upheavals in Irelands, including the Cromwellian conquest of Ireland in the mid 1600's, the Battle of the Boyne in 1690, and the Great Famine on the mid 1800's. The proposed development lies c.5km outside of the northern most site

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associated with the Battle of the Boyne. Changes in the agricultural landscape were seen in the form of field divisions and works aimed at improving their lands, including levelling and reclamation works, field drainage and other similar projects. These are typically evident during archaeological excavations in rural settings, as stone-filled drains or backfilled ditches that represent older field boundaries. Large stone-built houses were constructed to symbolise the status of the landowner, while smaller single-story buildings were built for the lower classes. These ruins are often found in rural landscapes caused by depopulation during the famine, while the larger, high-status houses often remain, such as Rokeby Hall and Piperstown House.

5.2 Previous Archaeological Investigations

The site was not subject to any previous archaeological investigations. However, several excavations have taken place within the environs of the site. To the north, in the area in which the proposed survey is to be carried out, most of these investigations found no archaeological significance, with the apparent exception of Barry's excavations of the deserted medieval settlement mentioned above, and two which identified prehistoric pit features (Licence Nos. 03E1142 and 22E0655).

To the south, excavations associated with the construction of the M1 motorway identified Bronze Age sites of fulacht fiadh and enclosures and an early medieval souterrain site (00E0631). Additionally, the multi-period site mentioned above, and in the present location of the M1 Retail Park (05E0072), included material dating from the early Neolithic period to the Iron Age.

Listed below (Table 1) are the nearest previous archaeological investigations undertaken in the environs of the site (see Figure 2), which further demonstrate the overall archaeological potential of the site and its surrounding townlands. The following information was taken from the *Database of Irish Excavation Reports* (www.excavations.ie). Where applicable, associated reports were accessed through the National Monuments Service's (NMS) Virtual Reading Room.

Table 1: Previous archaeological investigations within the environs of the site

Excavation.ie reference	Licence No.	Site-Type	Investigation Type
1987:38 - PIPERSTOWN, Piperstown, Louth	N/A	Settlement deserted - medieval	Excavation
1995:219 - GALLSTOWN, Louth	N/A	Cultivation ridges	Monitoring

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Excavation.ie reference	Licence No.	Site-Type	Investigation Type
2000:0694 - MELL (1), Louth	00E0946	Fulacht Fia	Excavation
2000:0695 - MELL (2), Louth	00E0430	Burial ground and Cremation pit	Excavation
2000:0696 - MELL (3), Louth	00E0631	Souterrain and Field Boundary	Excavation
2000:0697 - MELL (5), Louth	00E0945	Fulacht Fia	Excavation
2000:0698 - MELL (6), Louth	00E0940	Prehistoric - Pit	Excavation
2000:0715 - TULLYALLEN (1), Louth	00E0429	Barrow - ring-barrow	Excavation
2000:0716 - TULLYALLEN (2), Louth	N/A	No archaeology found	Test Excavations
2000:0719 - TULLYALLEN (6), Louth	00E0944	Enclosure and Furnace	Excavation
2000:0717 - TULLYALLEN (4), Louth	00E0832	Burnt pit and Enclosure	Excavation
2001:869 - MELL 2, Louth	00E0430 ext.	Ring-Ditch and Enclosure	Excavation
2001:871 - MELL 4, Louth	01E0067	Fulacht Fia	Excavation
2003:1249 - DRUMSHALLON: Gallstown Quarry, Louth	02E1766 ext.	No archaeology found	Monitoring
2003:1287 - PIPERSTOWN, Louth	03E1142	Prehistoric - Pit	Excavation
2005:1084 - WATERUNDER, Mell, Louth	05E0072	Settlement cluster and Industrial site	Excavation
2016:010 - Piperstown, Louth	15E0441	No archaeology found	Monitoring
2016:316 - Piperstown, Ballymakenny, Louth	16E0114	No archaeology found	Test Excavations
2020:529 - Tullyallen, Mell, Louth	20E0088	Enclosure and Furnace	Test Excavations
2022:502 - Drumshallon, Louth	22E0655	Prehistoric - Pits	Test Excavations

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Excavation.ie reference	Licence No.	Site-Type	Investigation Type
2023:200 - Mell, Drogheda, Louth	23E0781	No archaeology found	Test Excavations

5.3 Recorded Monuments

The *Record of Monuments and Places* (RMP) and *Sites and Monuments Record* (SMR) are compiled and updated by the National Monuments Service and the National Historic Properties Service. The RMP is comprised of manuals that list all known archaeological sites and monuments in a county with accompanying maps (based on Ordnance Survey (OS) six-inch maps) locating these sites. All sites included in the RMP are protected under the National Monuments Acts (1930–2004). The SMR consists of all records stored in the Archaeological Survey of Ireland national database and is presented in the Historic Environment Viewer. The last published RMP for County Louth is dated 1997, and as such, many of the sites listed in the SMR are scheduled for inclusion in the next revision of the RMP.

There is one recorded archaeological monument, as listed in the *Record of Monuments and Places* (RMP) or the *Sites and Monuments Record* (SMR), located within the proposed development site boundary. LH021-014 relates to a standing stone at Drumshallon.

Below (Table 2) is a list of these monuments and those within 1km of the site. These are included in Figure 2, which also includes monuments in the wider landscape. These descriptions are derived from the National Monuments Service Archaeological Survey Database (<https://heritagedata.maps.arcgis.com/apps/webappviewer/>).

Table 2: Recorded Monuments in the environs of the site

LH018-042	Enclosure	STONEHOUSE
Marked as large enclosure on a hilltop on Taylor and Skinner's map of 1777. No visible surface trace. Six-Inch First edition: Not indicated. Six-Inch Latest edition: Not indicated. ITM Coordinates: 706658, 784975 Latitude and Longitude: 53.803371, -6.380778		
LH018-043	Souterrain	ROKEBY

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Local tradition of a 'cave' in a tree-ring. Now destroyed. (IFC Schools MSS 674, 157).

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: Not indicated.

ITM Coordinates: 708358, 785645

Latitude and Longitude: 53.809038, -6.354746

LH021-009

Standing stone

KEARNEYSTOWN

A small standing stone (max. dims. H 1.2m; 0.6m by 0.2m in section).

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: Not indicated.

ITM Coordinates: 707098, 784206

Latitude and Longitude: 53.796373, -6.374368

LH021-010

Mass-rock

KEARNEYSTOWN

The W edge of a piece of rock outcrop, on the N edge of a hillock, has a carving of a small cross with the foot expanded to depict a possible chalice. Also carved on the rock is a name (C. Dolan) and date (1866). In addition there is what appears to be a word in Irish. According to local information in the 1930's, Oliver Plunkett is suppose to have said mass here.

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: Not indicated.

ITM Coordinates: 707458, 784535

Latitude and Longitude: 53.799254, -6.368792

LH021-011

Ritual site - holy well

GALLSTOWN

Marked on the 1912 'OS 6-inch' map as 'Toberanelshy'. Also referred to as 'Tober an Eleshy'.

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: 'Toberanelshy'

ITM Coordinates: 707683, 784237

Latitude and Longitude: 53.796531, -6.365482

LH021-012

Burial ground

CARTANSTOWN

Local tradition of a graveyard to S of Cartanstown Lough.

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Six-Inch First edition:

Six-Inch Latest edition:

ITM Coordinates: 707597, 783460

Latitude and Longitude: 53.789569, -6.367058

LH021-014

Standing stone

DRUMSHALLON

Situated on lower S slope of broad E-W ridge called 'Carnanbreaga'. Large slab of shale (max. dims. H 2.3m, 1.3m by 0.2m in section) orientated E-W.

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: 'Standing Stone'

ITM Coordinates: 707992, 783542

Latitude and Longitude: 53.790224, -6.361037

LH021-015

Standing stone

DRUMSHALLON

Situated on the upper E slopes of a high outcrop ridge called 'Carnanbreaga'. The stone is roughly rectangular in plan (H 1.6m, 0.9m by 0.4m in section) with the narrow sides orientated E-W. There are some recent scored marks at the NE corner, but also the weathered remains of what may be an ogham inscription at a height of 0.5-1.25m.

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: 'Standing Stone'

ITM Coordinates: 708341, 783887

Latitude and Longitude: 53.793250, -6.355622

LH021-016001

Ringfort - rath

BRITTAS

Sub-circular area (int. dims. 33m E-W, 31.5m N-S) enclosed by earthen bank (Wth 10.5m, H 1.7m internally, 4m externally) with traces of external U-shaped fosse (Wth 10m, D 1.5m). Fosse replaced by modern lane from SSW-W. The degraded bank has many gaps, but the gap to NNE is probably the original entrance (Wth 3.7m). Tradition of souterrain (LH021-016002-) at site.

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: Not indicated.

ITM Coordinates: 709538, 784500

Latitude and Longitude: 53.798506, -6.337244

LH021-016002

Souterrain

BRITTAS

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Local tradition of a 'cave' in ringfort (LH021-016001-).

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: Not indicated.

ITM Coordinates: 709537, 784499

Latitude and Longitude: 53.798497, -6.337260

LH021-018001

Church

DRUMSHALLON

Undivided nave and chancel (int. dims. c. 17.25m by c. 6.80m), built of uncoursed limestone slabs, boulders and greywacke. The building has been heavily buttressed on all four corners and along the S wall. It has a doorway in the S wall (W end) and a window in the E gable, but is otherwise featureless. The doorway is still intact but is obviously rebuilt since it has a straight joint c. 50cm to the E of the E jamb running the full height of the wall. There is a reveal on each side of the doorway and the jambs are constructed with a hard grey sandstone. The arch is two-centred, built of limestone slabs, and has a keystone.

When the church was inspected and recorded in 1966 by the Archaeological Survey the remains of a three-light E window could be seen, but when visited in 1985 this had collapsed outwards and had been partly covered by large stones from field clearance. It was apparently a single-light lancet window with a two-centred arch of sandstone with a blocked light on each side. It seems originally to have had a large three-light window with hard grey sandstone, chamfered and diagonally tooled, possibly of late thirteenth-century date. Little remains of the featureless N and W walls. The remains are probably basically of a sixteenth-century date, but parts of the doorway and E window indicate some late thirteenth-century building.

The church had the remains of a graveyard around it and part of a low earthen bank to its E which may have been the remnants of an early enclosure (LH021-018002-), but this has now been levelled. Holy Trinity Priory, Dublin, had a cell of three canons of the Church of St Mary's, Drumshallon, but it was suppressed in 1240-6 and became parochial.

Six-Inch First edition: 'Church' (in ruins)

Six-Inch Latest edition: 'Church' (in Ruins)

ITM Coordinates: 709290, 783589

Latitude and Longitude: 53.790375, -6.341330

LH021-018002

Ecclesiastical enclosure

DRUMSHALLON

The remains of an irregular shaped low earthen bank around the church (LH021-018001-) was visible when inspected by ASI in 1966 (ASI field note 28 June 1966). The SE segment was faced with stone. This bank may have been the remnants of an early enclosure, but has since been levelled.

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: Not indicated.

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ITM Coordinates: 709293, 783586

Latitude and Longitude: 53.790347, -6.341286

LH021-018003

Graveyard

DRUMSHALLON

Irregular shaped graveyard (map dims. max. L 80m; max Wth 50m) with church remains (LH021-018001-) in N half. Only one possible graveslab was visible in graveyard when inspected by ASI in 1966, however there were two graveslabs inside church, one dating to 1675 and the other dating to 1760.

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: 'Graveyard'

ITM Coordinates: 709296, 783578

Latitude and Longitude: 53.790275, -6.341243

LH021-018004

Graveslab

DRUMSHALLON

Graveslab dedicated to Walter Eccleston of Drumshallon and dated 1675, located inside church (LH021-018001-).

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: Not indicated.

ITM Coordinates: 709298, 783591

Latitude and Longitude: 53.790391, -6.341208

LH021-023

Souterrain

CARTANSTOWN

Local tradition of a 'cave' to N of Cartanstown House.

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: Not indicated.

ITM Coordinates: 707608, 783306

Latitude and Longitude: 53.788183, -6.366945

LH021-024

Standing stone

PIPERSTOWN

Situated in flat pasture. Large block of limestone (max. dims. H 2.5m, 1.7m by 1.5m in section) with long axis orientated NNW-SSE. The ENE face of the stone is covered by small depressions resembling cup marks, but these appear to be natural solution-holes.

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: 'Standing Stone'

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ITM Coordinates: 708051, 782797

Latitude and Longitude: 53.783519, -6.360403

LH021-027001

Settlement deserted - medieval

PIPERSTOWN

Locally known as 'Mullavilla', situated on high ground which falls away to the N and S, and consisting of a complex of irregular platforms and enclosures. The site covers c. seven acres in extent and has been disturbed by the cutting of a modern trackway across its central portion. Five irregular platforms can be identified. Most are rectangular or sub-rectangular (Wth c. 5m, L 5-15m) and some have slight evidence for enclosing banks. The enclosures vary considerably in size, shape and form, the smallest being almost 14m square with enclosing banks, others being large sub-rectangular sunken areas. There is no regular pattern or scheme, such as the association of platforms with the enclosures, and no obvious evidence for a sunken way. Motte LH021-027002- is situated just to the E, giving credence to the interpretation of this site as a deserted medieval village. However, an archaeological excavation of a limited area of the site in 1987, directed by T.B. Barry, indicated that it may be a post medieval rather than a medieval desertion.

Six-Inch First edition:

Six-Inch Latest edition:

ITM Coordinates: 708508, 782566

Latitude and Longitude: 53.781349, -6.353553

LH021-027002

Castle - motte

PIPERSTOWN

A small, almost oval, flat-topped mound (dims 18m N-S; 31m E-W at base; H 4.5m) which has been quarried extensively at the NNE side and disturbed at the W and S by the building of a modern boundary wall. There is no evidence for a fosse or bailey and the immediate area around the mound has been intensively cultivated. A possible deserted medieval village (LH021-027001-) lies just to the W of the motte.

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: Not indicated.

ITM Coordinates: 708596, 782549

Latitude and Longitude: 53.781178, -6.352224

LH021-052

Fulacht fia

PIPERSTOWN

Area of burnt stones and charcoal uncovered during ploughing, 100m NE of standing stone (LH021-024----).

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: Not indicated.

ITM Coordinates: 708108, 782846

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Latitude and Longitude: 53.783948, -6.359521

LH021-084

Excavation - miscellaneous

PIPERSTOWN

A pair of conjoined pits in a figure-of-eight form, were identified while excavating drains in advance of plantation (Excavation Licence No. 03E1142). Pit 1, (Wth 0.95m NW/SE; D 0.13m) was lined with large stones and contained charcoal rich soil with fragments of burnt bone, the base was fire-reddened. Pit 2 (Wth 0.72m NW/SE; D 0.08m) contained occasional stones and charcoal rich soil. A small flue fed into both pits.

Six-Inch First edition: Not indicated.

Six-Inch Latest edition: Not indicated.

ITM Coordinates: 708198, 782556

Latitude and Longitude: 53.781324, -6.358258

5.4 Record of Protected Structures and National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) identifies, records, and evaluates the post-1700 architecture of Ireland in order to protect and conserve our built heritage. It is under the administration of the Department of Housing, Local Government and Heritage. It also forms the basis of a list for structures that should be included in the Record of Protected Structures (RPS) compiled by local authorities.

A Protected Structure is a structure that a planning authority think is of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social, or technical point of view. The structure is recognised as important and is protected from harm under legislation. Every local authority in Ireland must keep an RPS in their development plans.

There are no Protected Structures, as listed in the *Louth County Development Plan 2021-2027*, nor sites listed in the *National Inventory of Architectural Heritage (NIAH)*. The nearest such sites are Piperstown House (RPS ID. LHS021-015; NIAH Reg. No. 13902112) located 100m to the south, Cartanstown House (NIAH 13902111) located 430m west, and Stonehouse Estate (NIAH Ref: 13902110) located c. 550m west of the site.

Table 3: List of NIAH and RPS sites within the environs of the site

RPS No.	NIAH No.	Name	NIAH Importance
LHS021-015	13902112	Piperstown House	Regional

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RPS No.	NIAH No.	Name	NIAH Importance
-	13902111	Cartanstown House	Regional
<p>Detached five-bay two-storey over basement house, built 1842. Rectangular-plan, two-storey return to west. Hipped slate roof, partially hidden by rendered parapet, lead flashing to ridges, smooth rendered corbelled chimneystacks, clay pots. Smooth rendered ruled-and-lined walling, dressed limestone ashlar V-jointed quoins, cornice and coping to parapet. Square-headed window openings, dressed limestone sills, painted timber six-over-six and three-over-six (second floor and basement) sliding sash windows, wrought-iron guards to basement. Square-headed door opening, block-and-start dressed limestone surround, leaded stained glass overlight, dressed limestone cornice, painted timber three-panel double doors, limestone steps bridging basement, cast-iron railings, cast-iron boot scraper. Set in own grounds; two-storey random rubble stone outbuildings c. 1850 to west, ranged around farmyard, hipped slate roofs, dressed limestone quoins, round-headed entrance arch at north side; rubble masonry boundary walls; gravel avenue to south-east; entrance to south-east, limestone ashlar gate piers, pyramidal capstones.</p>			
-	13902110	Stone House	Regional
<p>Detached seven-bay two-storey over basement house, built c. 1660. Rectangular-plan, pedimented central entrance bay to west, eighteenth- and nineteenth-century rectangular extensions to east, flat-roofed single-storey porch to south c. 1870. Pitched slate roofs, hipped to north of south-east extension, clay and stone ridge and hip tiles, red brick corbelled chimneystacks, dentil blocks to south-east chimney, clay pots, stone verge coping to north and south gables, red brick eaves course, circular cast-iron downpipe to west elevation. Roughcast-rendered walling to west, painted smooth rendered walling to east, smooth rendered ruled-and-lined walling to south; pediment to west, red brick cornice and string course, blind lunette, red brick surround. Square-headed window openings, tooled stone sills, red brick surrounds to west, moulded rendered surrounds to ground floor south elevation and porch, chamfered reveals to first floor south elevation, painted timber two-over-two, one-over-one and six-over-six sliding sash windows, uPVC windows to north-east. Square-headed door opening to west, evidence of original larger entrance, painted timber panelled door with four flat panels, plain-glazed overlight, limestone steps to entrance bridging basement flanked by random rubble walls; square-headed door opening to porch, moulded rendered surround, painted vertically-sheeted timber door, plain-glazed panel. Set in own grounds; random rubble stone outbuildings to south and south-west, corrugated-iron roof, square-headed openings, painted timber sliding sash windows, vertically-sheeted timber doors; walled garden to south-east, random rubble stone walls, seven bee holes in eastern wall.</p>			
<p>Detached five-bay three-storey over basement house, built c. 1760. Rectangular double-pile plan, single-storey addition to west c. 1800. Pitched slate roofs, clay ridge tiles, red brick and smooth rendered corbelled chimneystacks, tooled stone verge coping, moulded cast-iron gutters to overhanging eaves, circular cast-iron downpipes. Painted roughcast-rendered walling, painted stone plinth and V-jointed quoins. Square-headed window openings, painted smooth rendered soffits and reveals, painted timber six-over-six (ground and first floors), three-over-three (second floor) and one-over-one (ground floor south elevation) sliding</p>			

RPS No.	NIAH No.	Name	NIAH Importance
		<p>sash windows; painted timber fixed-light windows to west extension. Open-bed pedimented north entrance, tooled limestone raking cornice, engaged Doric columns on block plinths, incised benchmark west plinth, painted timber Y-tracery fanlight in dressed limestone tympanum; square-headed door opening, dressed limestone surround, painted timber twelve-panel door, dressed limestone threshold and flagstones; square-headed door opening to extension, painted vertically-sheeted timber door. Set in own grounds; driveway to north and east, grass to south, east and west, limestone balustrade running eastwards from north-east corner of house; single- and two-storey random rubble stone outbuildings to south-east around concrete yard, pitched slate and corrugated-iron roofs, hipped to west building, red brick bellcote to north-west building, square- and segmental-headed openings, some red brick surrounds, painted vertically-sheeted timber doors, stone steps to west end of north-west building.</p>	

5.5 Finds listed within the Topographical Files of the National Museum of Ireland

The Topographical Files of the National Museum of Ireland list all artefacts in the care of or known to the museum. Such a record can provide evidence for human settlement or activity in the absence of other physical remains or documentary references.

Details of these finds for the townland of Piperstown are outlined in Table 4 below. No artefacts are listed for the townlands of Drumshallon, Gallstown, Kearneystown, Stonehouse or Swinestown.

Table 4: Archaeological Artefacts listed in The Topographical Files of the National Museum of Ireland

NMI Register No	Simple Name	Component	Townland	Find Place
1991C1:146	Button	Tinned copper alloy	PIPERSTOWN	
1991C1:157	Coin	Silver	PIPERSTOWN	
2015C1:28.1	Flint	Flint	PIPERSTOWN	UNKNOWN
2015C1:28.2	Flint	Flint	PIPERSTOWN	UNKNOWN
2015C1:28.3	Flint	Flint	PIPERSTOWN	UNKNOWN
2015C1:28.4	Flint	Flint	PIPERSTOWN	UNKNOWN

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NMI Register No	Simple Name	Component	Townland	Find Place:
2015C1:28.5	Flint	Flint	PIPERSTOWN	UNKNOWN
2015C1:28.6	Flint	Flint	PIPERSTOWN	UNKNOWN
2015C1:28.7	Flint	Flint	PIPERSTOWN	UNKNOWN

5.6 Cartographic Evidence

A review of available historic mapping for the area was carried out to include the 6-inch (1836) and 25-inch (1910) editions of the Ordnance Survey (OS) of Ireland (now Tailte Éireann) maps (Figures 3-4). Potential archaeological or cultural heritage features are often marked on such maps, and they can provide a helpful resource in identifying sites, particularly if they no longer have any above-ground remains.

No archaeological or cultural heritage features are shown within the proposed development site on the examined mapping beyond those previously discussed in previous sections.

5.7 Aerial Photography

Aerial photographs dating between 1995 and 2018 from Tailte Éireann and Google Earth imagery dating between 2005 and 2024 were assessed. Unrecorded archaeological sites can often be identified in aerial photographs as cropmarks or differential growth in a field.

No archaeological or cultural heritage features are shown within the proposed development site on the examined mapping (Figure 5).

6. METHOD OF DATA INTERPRETATION

As outlined above, a detailed gradiometer survey that allows the detection of potential archaeological responses was conducted. The SENSYS MAGNETO MXV3 8-sensor fluxgate is a specifically designed gradiometer for use in archaeological prospection. Extremely sensitive, these instruments can detect variations in soil magnetism between 0.25nT and 10,000nT, affording diverse applications throughout various archaeological, soil morphological and geological conditions. The survey was geo-referenced through the

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MonMX software with a Trimble R10 RTK GNSS receiver accurate to $\pm 1\text{cm}$. The results were interpreted by examining the raw data as greyscale images produced in DW Consulting's TerraSurveyor 64 software. Greyscale images are exported as TIFF files along with a corresponding World file (.TFW), which are then imported to progeCAD 2018 for georeferencing and AutoCAD LT 2025 for interpreting. Processed raw data in the form of greyscale images are presented in Figures 12-17, and an interpretation is included in Figures 17-28.

7. SURVEY RESULTS

The geophysical survey was conducted in May 2025 by Donald Murphy, Robert Breen and Jeanne Rochford of ACSU under licence 25R0179 (Figures 17-28). The anomalies identified are listed in Table 4 below.

Table 5: Geophysical survey results

Anomaly No.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
M1	?Archaeology	Curvilinear ditch/enclosure?	A faint positive curvilinear feature in Field 16 that may represent the remains of a possible enclosure ditch. It measures 43m in width east-west. The anomaly is situated in the northwest of the field in close proximity to an annotated well or 'tobertheorin' (well of the boundary) on the Ordnance Survey 25-inch map and may represent changes in underlying geology. (Figure 26).
M2	?Archaeology	Enclosure/early field system	Partial remains of a number of positive linear and curvilinear features along the southwestern boundary of Field 9 that may represent the remains of a possible settlement or enclosure site. An L-shaped ditch extends beyond the survey limits to the north and west. This features two adjoining curvilinear ditches to the east and west that also

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Anomaly No.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
			extend beyond the survey limits. (Figure 24).
-	?Archaeology	Small to medium anomalies: pits, posts, spreads, kilns, cut features	A series of positive anomalies occur sporadically across the survey area. These might represent cut features such as pits, postholes, spreads, kilns, or other types of archaeological features. May also be natural in origin.
-	Linear features	Former field boundaries	Positive linear anomalies throughout the survey area that correspond with former field boundaries depicted on the first edition Ordnance Survey (OS) 6-inch map, surveyed 1836, and the third edition Ordnance Survey (OS) 25-inch map, surveyed 1910.
-	Linear features	Early field systems	Positive linear anomalies across the survey area that may represent former field divisions that are not depicted on OS mapping.
-	Buried service	Linear trends	Dipolar linear trends that likely represent buried services such as water pipes, gas, electric etc; Fields 16, 17, 20, and 21.
-	Magnetic disturbance	Modern disturbance	Increased magnetic disturbance occurring along field boundaries and occasional scatters of increased dipolar responses.
-	Ferrous	Magnetic disturbance from modern debris	Bipolar anomalies sporadically occurring that are associated with magnetic interference from modern ferrous material, either in the topsoil or the surface of the survey area.

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Anomaly No.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
-	Natural/ underlying geology	Natural/changes in the underlying geology	Sporadically occurring bands of dipolar anomalies that likely correspond to changes in underlying geology.

8. IMPACT ASSESSMENT

The purpose of this impact assessment was to establish whether or not the site contained any evidence for the presence of previously unrecorded areas or features of historical, built heritage or archaeological significance and to determine the potential impacts the proposed development may have on such features.

A geophysical survey of the site was carried out under licence 25R0179. The surveyable area consisted of 14 pastoral fields. The survey area contains one monument in the *Record of Monuments and Places* (RMP) or *Sites and Monuments Record* (SMR). LH021-014 is a standing stone in the townland of Drumshallon.

This survey identified potential archaeological features within Fields 9 and 16, consisting of positive linear and curvilinear anomalies that may represent enclosures or settlement sites. At the same time, scatters of other anomalies across the survey area also represent potential archaeology (?Archaeology).

The proposed development of this site has the potential to impact the Recorded Monuments and possible features of archaeological significance identified at the following locations, if not adequately mitigated:

- Potential enclosure or curvilinear ditch (**M1**) in Field 9.
- Potential enclosure (**M2**) in Field 16.
- Scatters of other positive anomalies throughout the survey area that could represent potential archaeology.
- Recorded Monument **LH021-014**---- Standing stone in Field 9.

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9. CONCLUSIONS & RECOMMENDATIONS

The geophysical survey of Kellystown windfarm, Co. Louth (ITM 707980, 783365) was carried out to assess the site's archaeological potential. Eleven fields were inaccessible to survey due to unsuitable access conditions or the presence of crops.

The survey identified potential archaeological features within Fields 9 and 16 that consist of a series of curvilinear features (**M1 – M2**) that may represent the remains of enclosures. Scatters of other anomalies are also labelled as potential archaeology (?Archaeology). These include a concentration of anomalies; curvilinear and linear responses, and small responses that could represent archaeological features such as pits, postholes, spreads and kilns, but could also be of a natural origin.

Features depicted on the examined Ordnance Survey mapping were also detected, including linear anomalies corresponding with former field boundaries. Linear anomalies that are not recorded field boundaries were also detected, and they likely represent pre-OS field systems, drains or paths/access routes.

It is recommended that:

- Anomalies identified are targeted during a test trenching programme, in particular the potential enclosure sites (**M1** and **M2**), linear features, curvilinears, field systems, pits, spreads and any features of archaeological significance and potential. Any identified features shall be sufficiently sectioned to assess their depth, nature and archaeological potential. Following the test trenching, the National Monuments Service should be consulted to agree on an appropriate mitigation strategy for the development of the site.
- If preservation *in situ* is not an option in some areas and any archaeological features will be directly impacted by the proposed development, preservation by record (full excavation) is recommended.
- In addition, a 20m buffer or exclusion zone should be set up around the Recorded Monument LH021-014- Standing stone in the townland of Drumshallon. This exclusion zone will be established prior to the construction phase to highlight the archaeologically sensitive area surrounding the recorded monument and ensure that no excavation or other temporary works take place at this location. Prior to construction commencing, a temporary protective fence should be erected on site and should remain for the duration of the proposed construction works. The exclusion zones should not be used for the storage of construction material or plant.

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- All further groundworks within the proposed development site should also be monitored, and any further archaeological features identified should be preserved *in situ* or by record (excavation) in consultation with the National Monuments Service.

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Louth County Development Plan 2021-2027

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11. APPENDIX 1 – SUMMARY TECHNICAL INFORMATION & GLOSSARY OF TERMS

Detailed magnetometer Surveys offer an effective and efficient way of surveying large areas for anomalies associated with past human activity by mapping and visualising spatial variations in the local magnetic field. Anomalies of archaeological interest can be identified as they emit contrasting magnetic properties to those of the surrounding soil. This allows for the identification of various archaeological features such as kilns, hearths and burnt mounds as they result in strong magnetic responses. Magnetometer surveys also help to identify ditches and pits that usually contain a multitude of deposits of varying magnetic properties that stand out in contrast to the consistency of the surrounding undisturbed soil. This allows for the identification of sites such as enclosures, ring-ditches and field systems that have been over time, ploughed out of the visible landscape.

Survey results take the form of processed greyscale images and interpretation figures that can be georeferenced over satellite imagery or development plans for a full assessment of the archaeological impact of any given project.

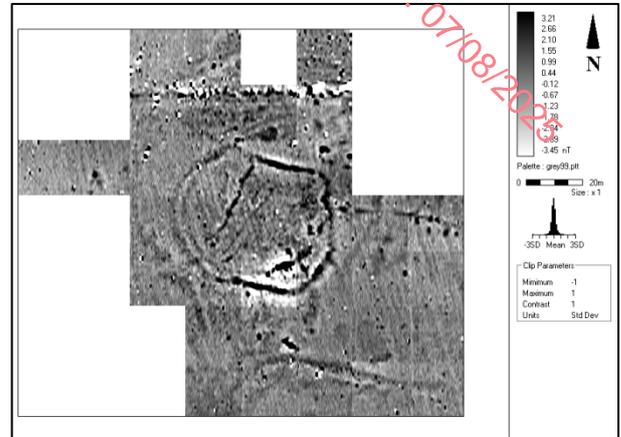
A constant high quality of data is assured by experienced field staff operating in accordance with EAC *Guidelines for the use of Geophysics in Archaeology* (Schmidt et al. 2015) and English Heritage's *Geophysical Survey In Archaeological Field Evaluation* (David et al. 2008).



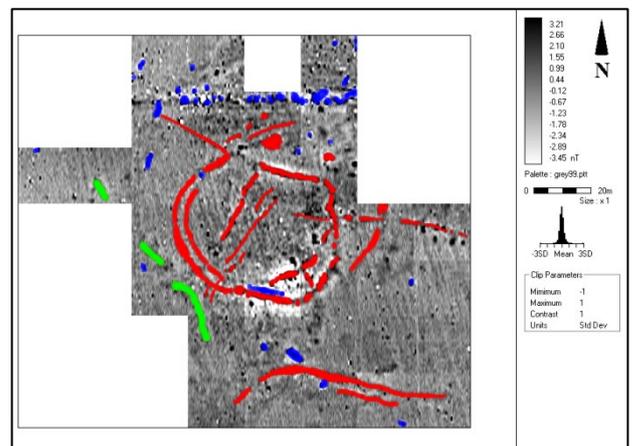
SENSYS MAGNETO® MXV3 modular carrier with 8 SENSYS FGM650/3 sensors spaced at 0.5m intervals

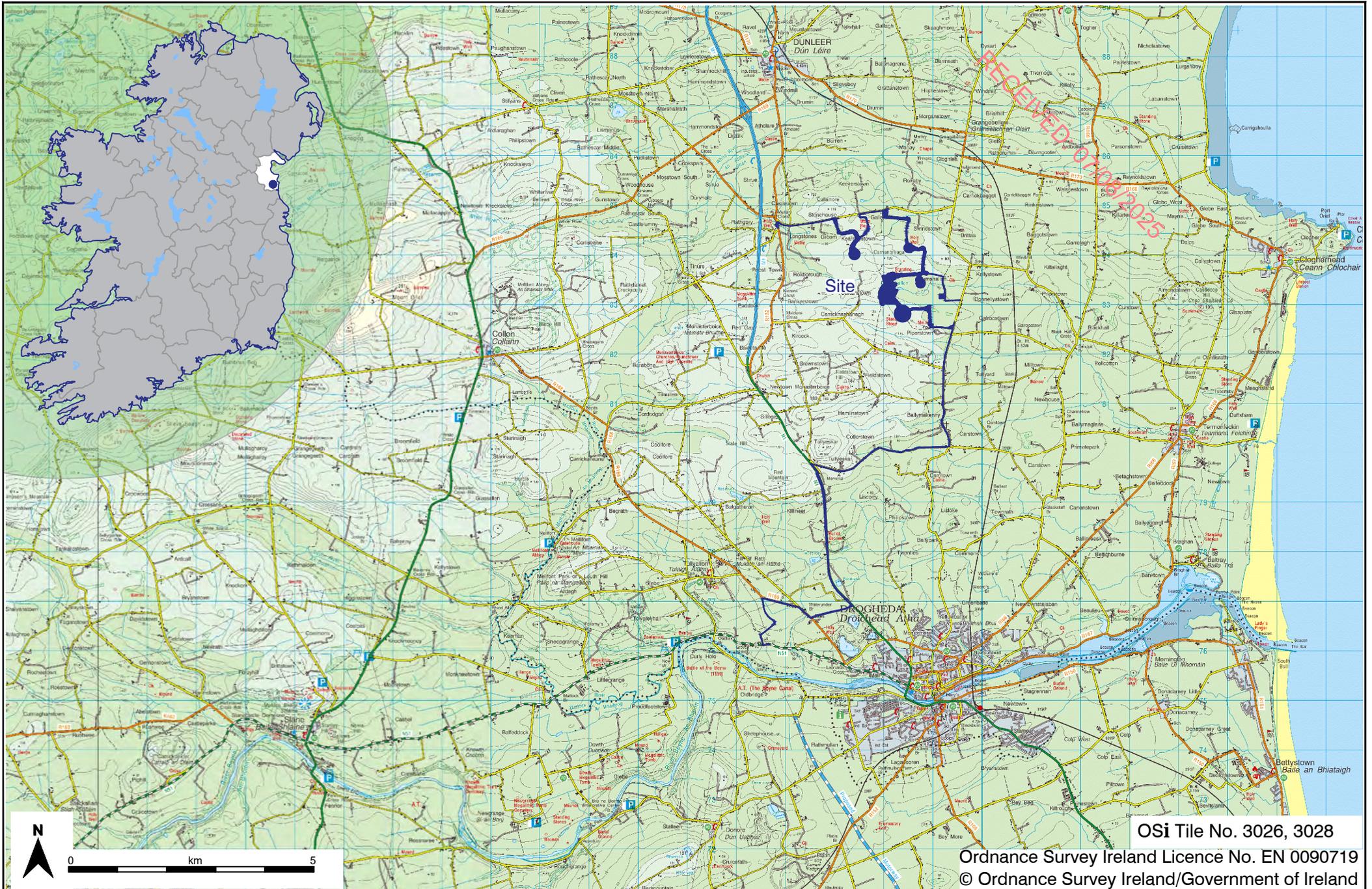
Data Display Formats

Greyscale: The greyscale format assigns a cell to each datum according to its location on the grid. The display of each data point is conducted at very fine increments, allowing the full range of values to be displayed within the given data set. This display method also enables the identification of discrete responses that may be at the limits of instruments detection.

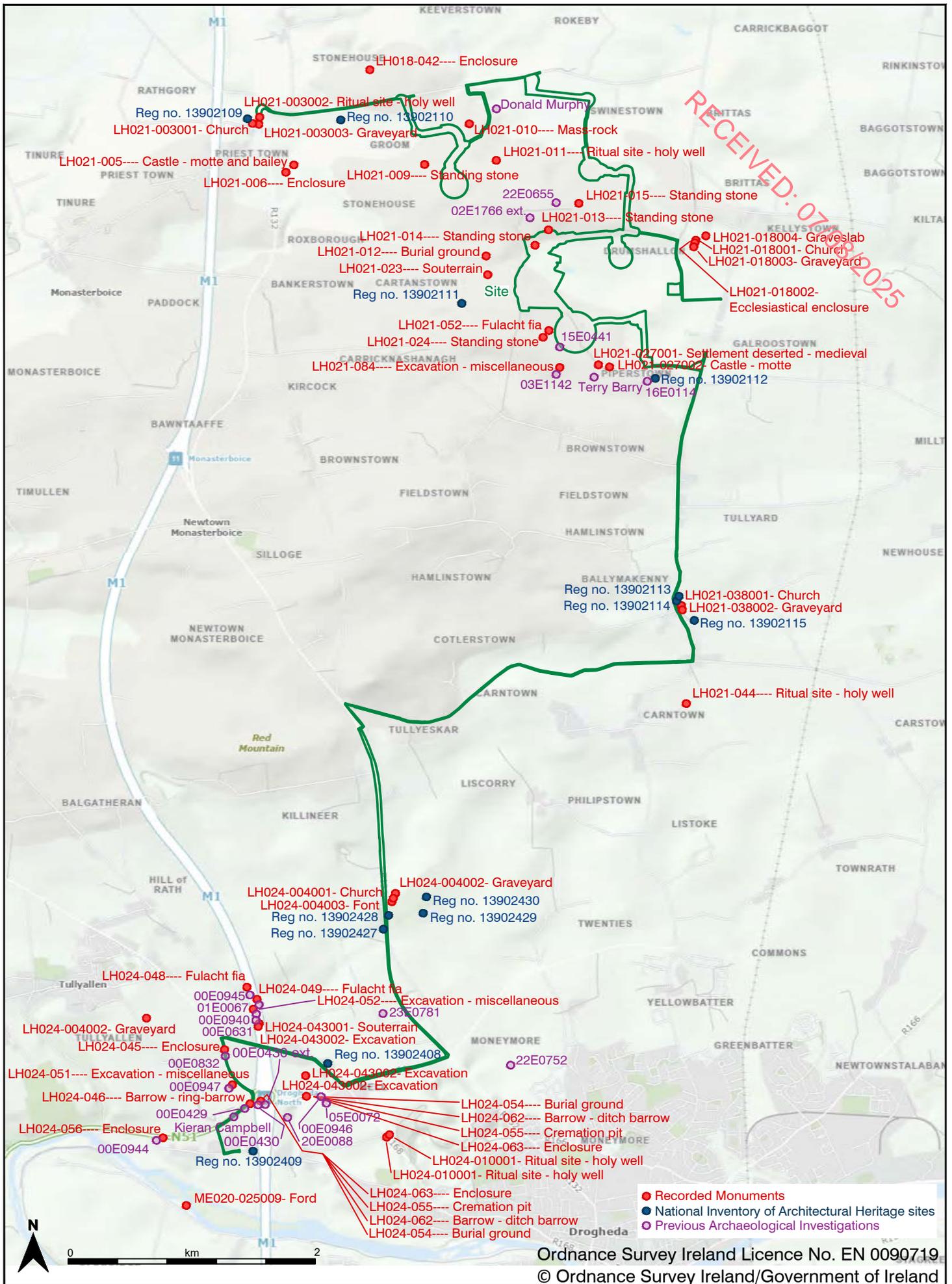


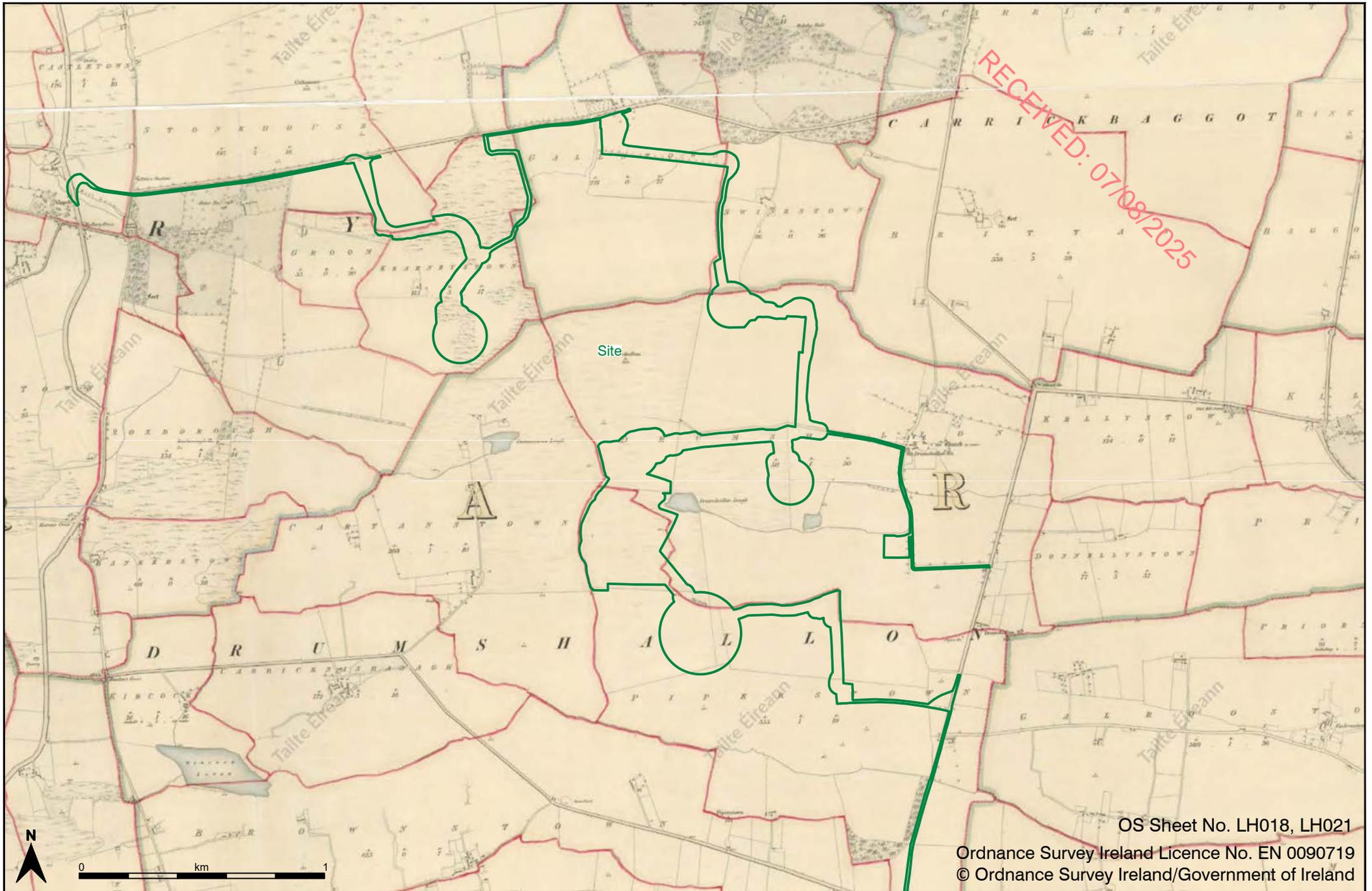
Interpretation: The greyscale images are used to create interpretation drawings of the various anomalies that represent features of archaeological potential, early field systems, trends, cultivation, modern ferrous interferences and underlying geological changes.





Project Kellystown Wind Farm, Co. Louth	Date May 2025	Drawing No. 2531_C1001	
Figure 1 Location of site		Scale 1:100,000 @ A4	





Project Kellystown Wind Farm, Co. Louth

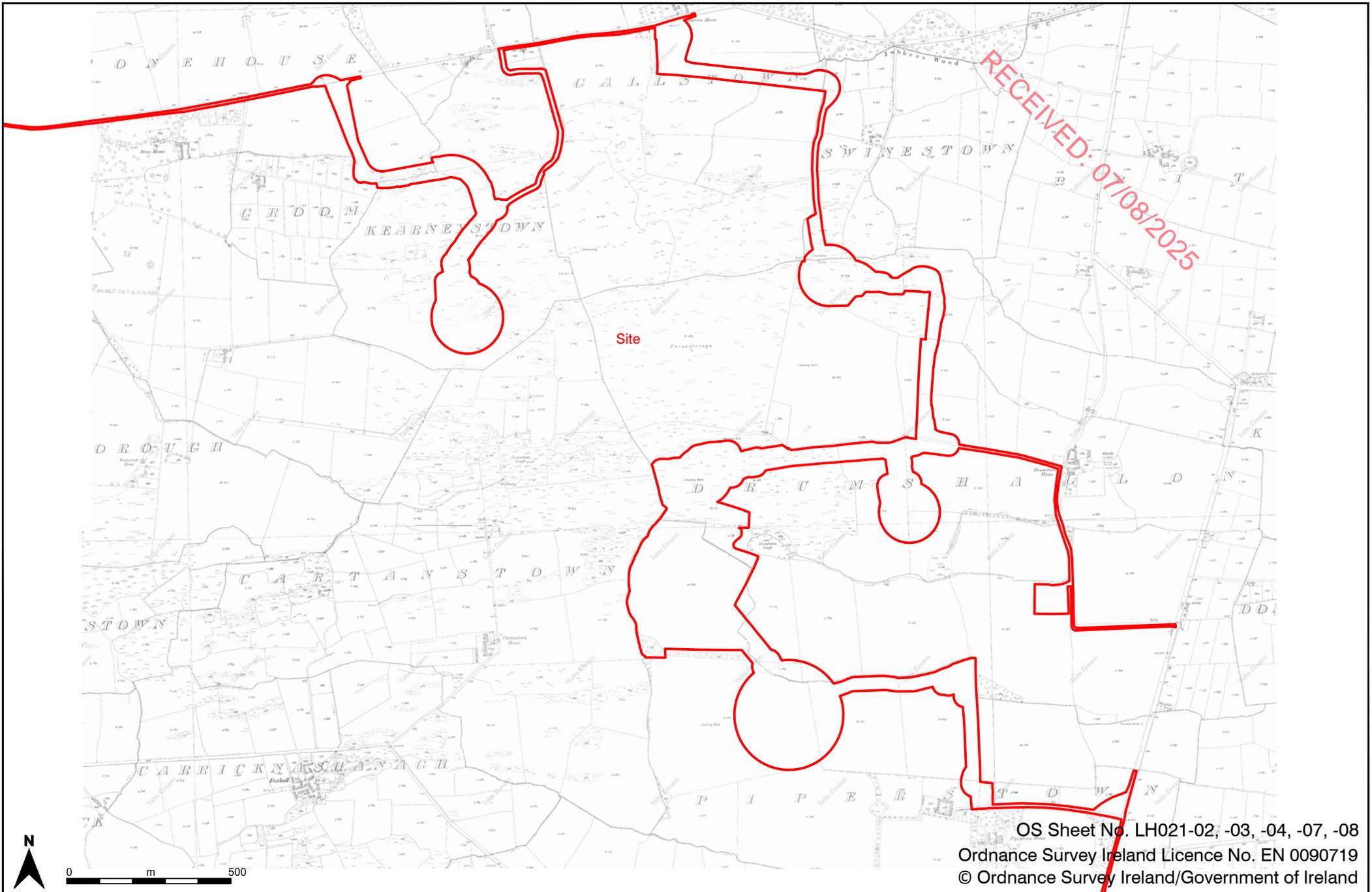
Date May 2025

Drawing No. 2531_C1003

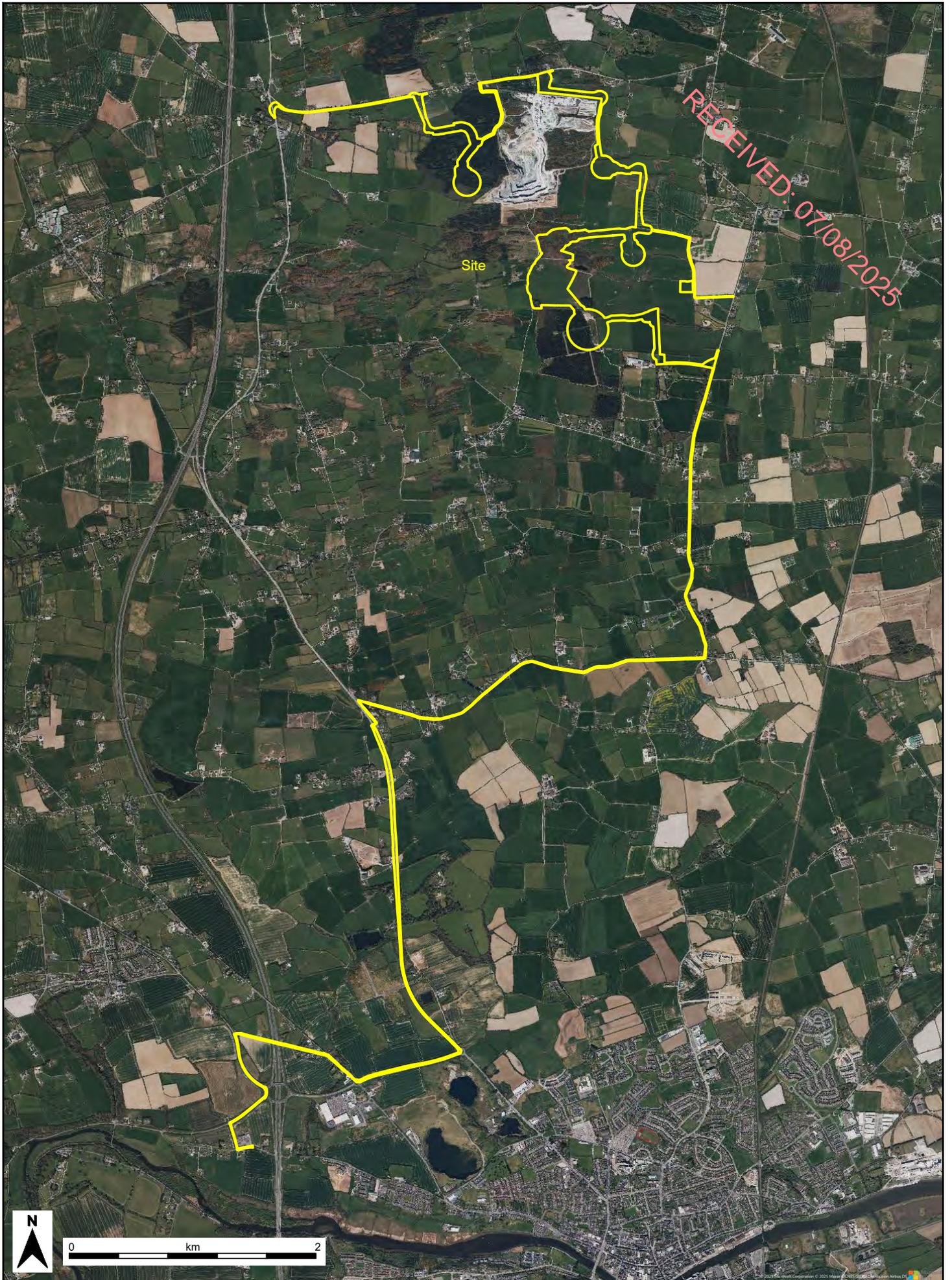
Figure 3 Extract from 1st edition Ordnance Survey (OS) 6-inch map (surveyed 1834 - published 1836), showing location of site

Scale 1:20,000 @ A4





Project Kellystown Wind Farm, Co. Louth	Date May 2025	Drawing No. 2531_C1003	
Figure 4 Extract from 3rd edition Ordnance Survey (OS) 25-inch map (surveyed 1908 - published 1910), showing location of site		Scale 1:15,000 @ A4	



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Site



0 km 2

Project Kellystown Wind Farm, Co. Louth

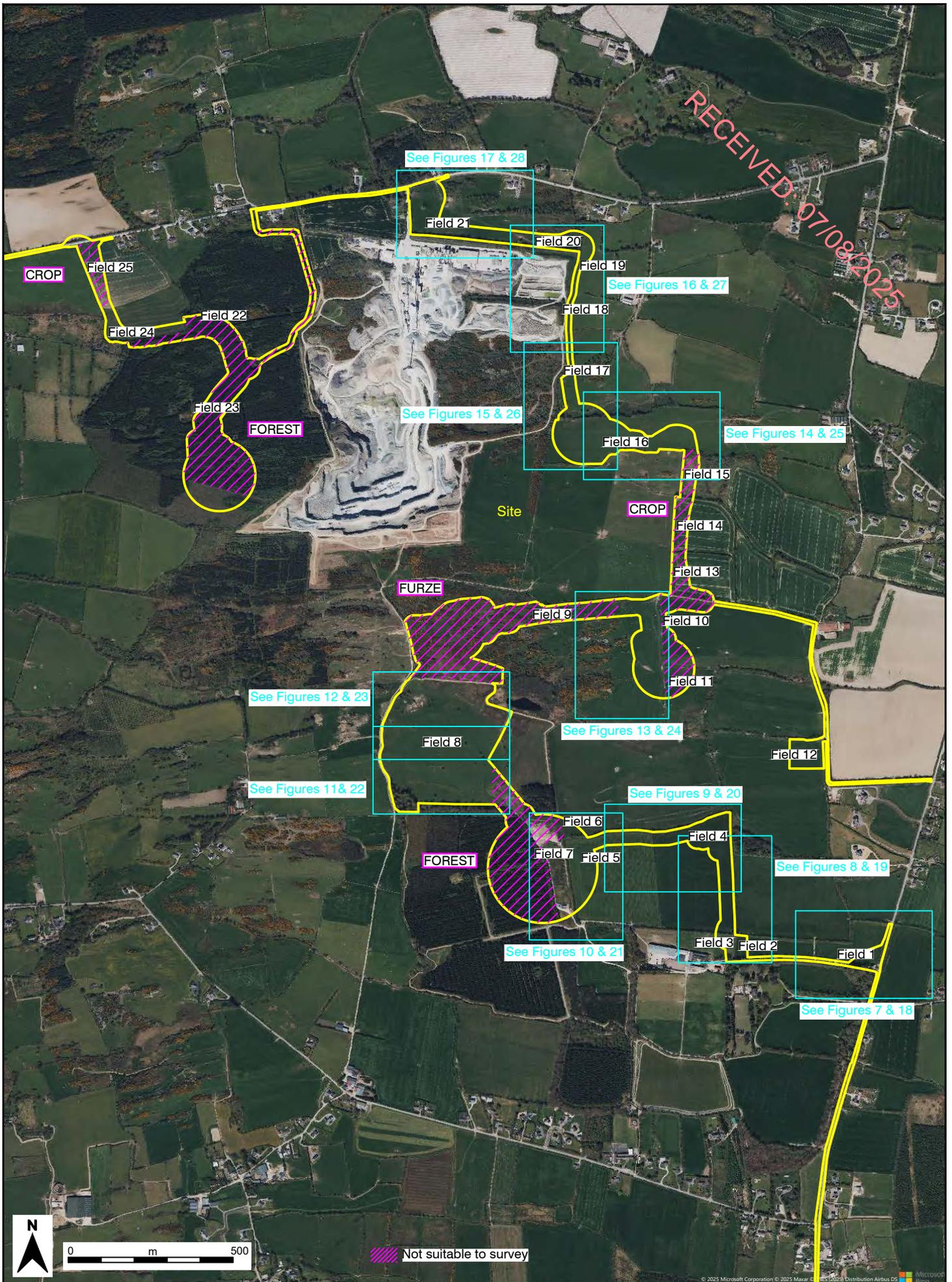
Date May 2025

Figure 5 Aerial view of site



Scale 1:40,000 @ A4 Drawing No. 2531_C1005

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Project Kellystown Wind Farm, Co. Louth	Date May 2025	
Figure 6 Aerial view of site, showing field numbers of geophysical survey areas		



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Field 1

Site



0 m 50

-1 nT 1

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Figure 7 Aerial view of site, showing geophysical survey results in Field 1 (greyscale images)	Scale 1:1,500 @ A4		

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Project Kellystown Windfarm, Co. Louth	Date May 2025	
Figure 8 Aerial view of site, showing geophysical survey results in Fields 2, 3 & 4 (greyscale images)		
		Drawing No. 2531_C1008



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Field 5

Site

Field 4



0 m 50

-1 nT 1

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Figure 9 Aerial view of site, showing geophysical survey results in Fields 4 & 5 (greyscale images)		Scale 1:1,500 @ A4	



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Field 5

Field 7

Site



0 m 50

-1 nT 1

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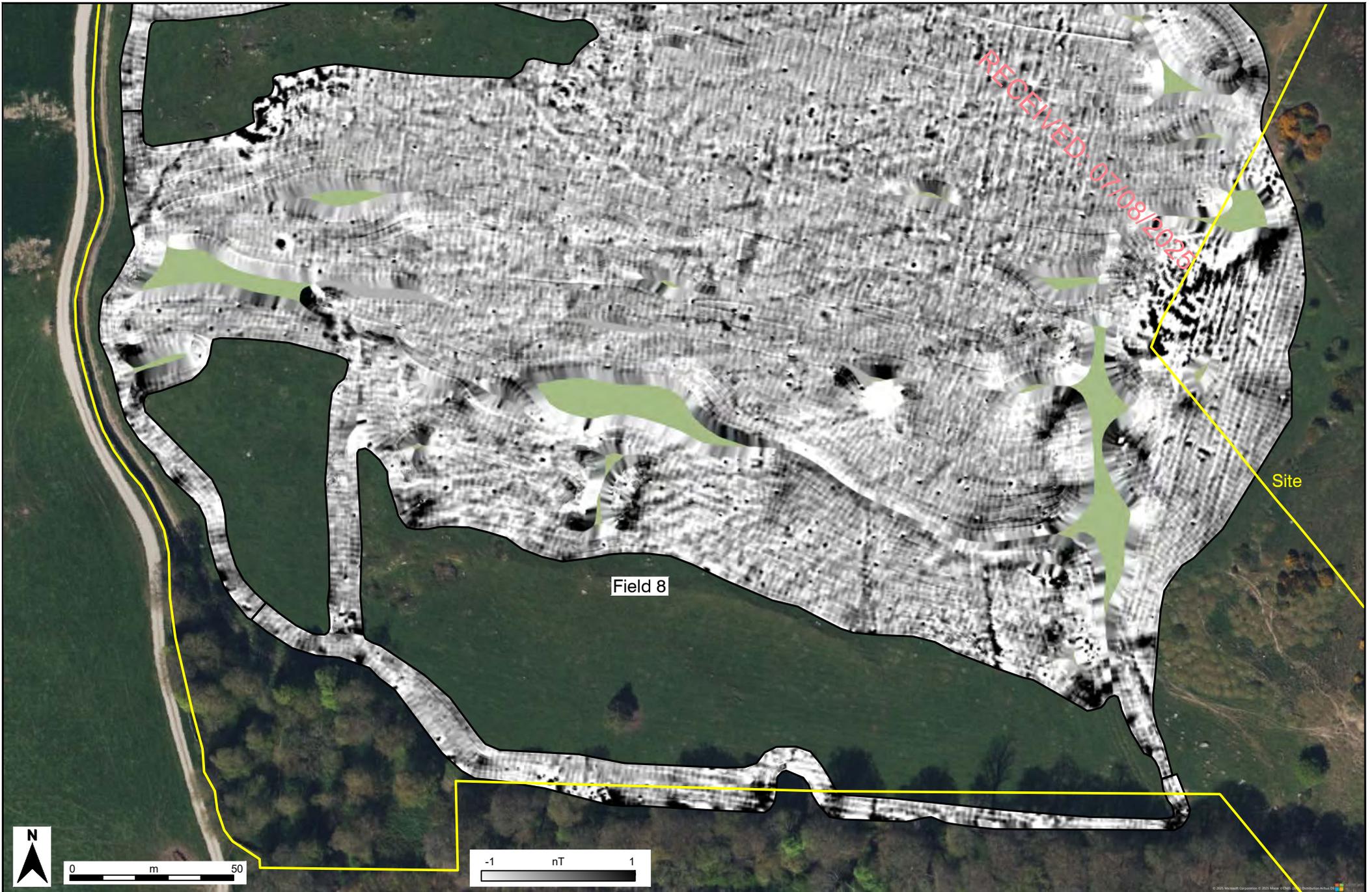
Date May 2025

Figure 10 Aerial view of site, showing geophysical survey results in Fields 5 & 7 (greyscale images)



Scale 1:1,500 @ A4

Drawing No. 2531_C10010



Project Kellystown Windfarm, Co. Louth

Date May 2025

Drawing No. 2531_C10011

Figure 11 Aerial view of site, showing geophysical survey results in Field 8 (greyscale images)

Scale 1:1,500 @ A4



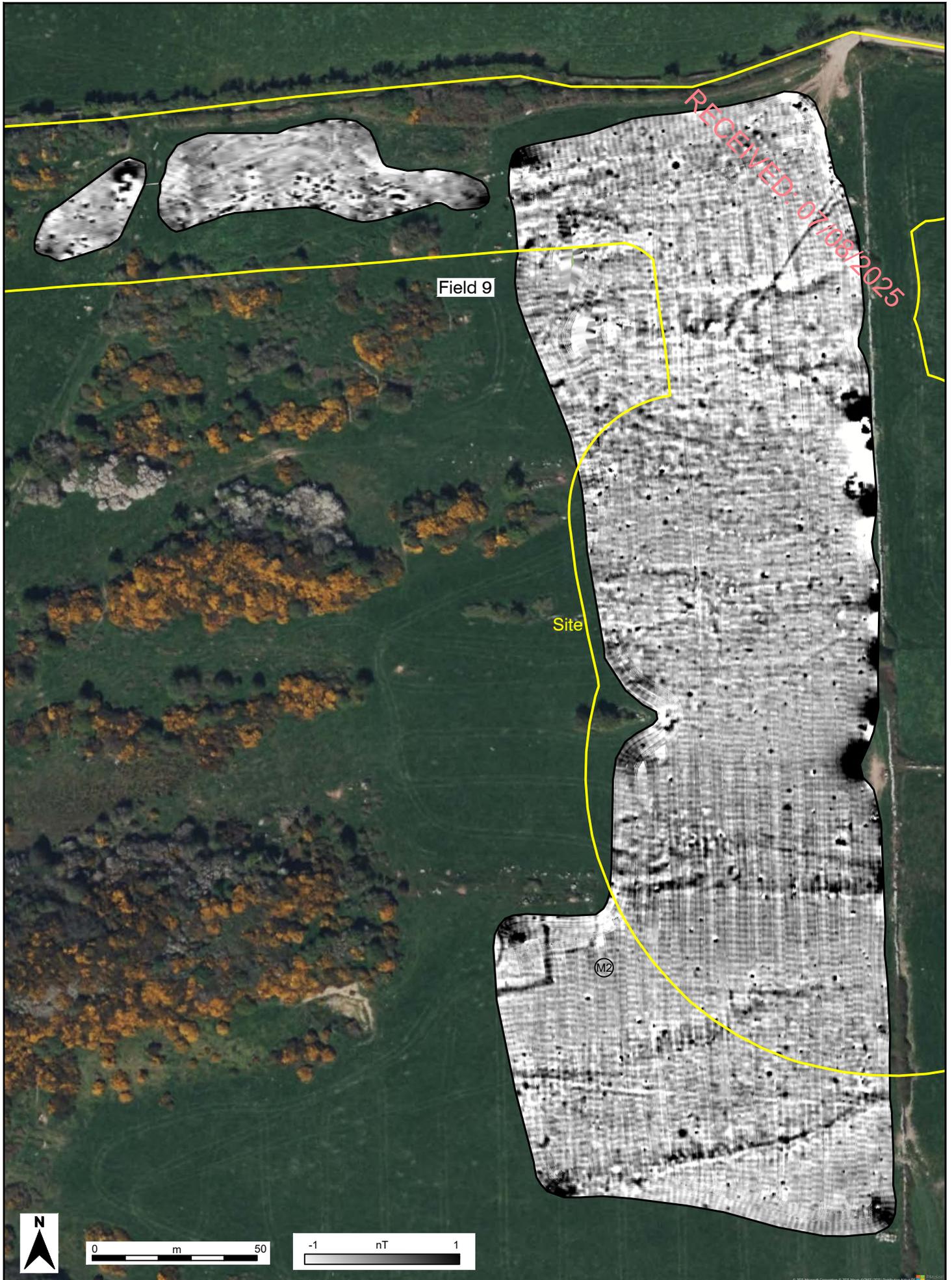
Project Kellystown Windfarm, Co. Louth

Date May 2025

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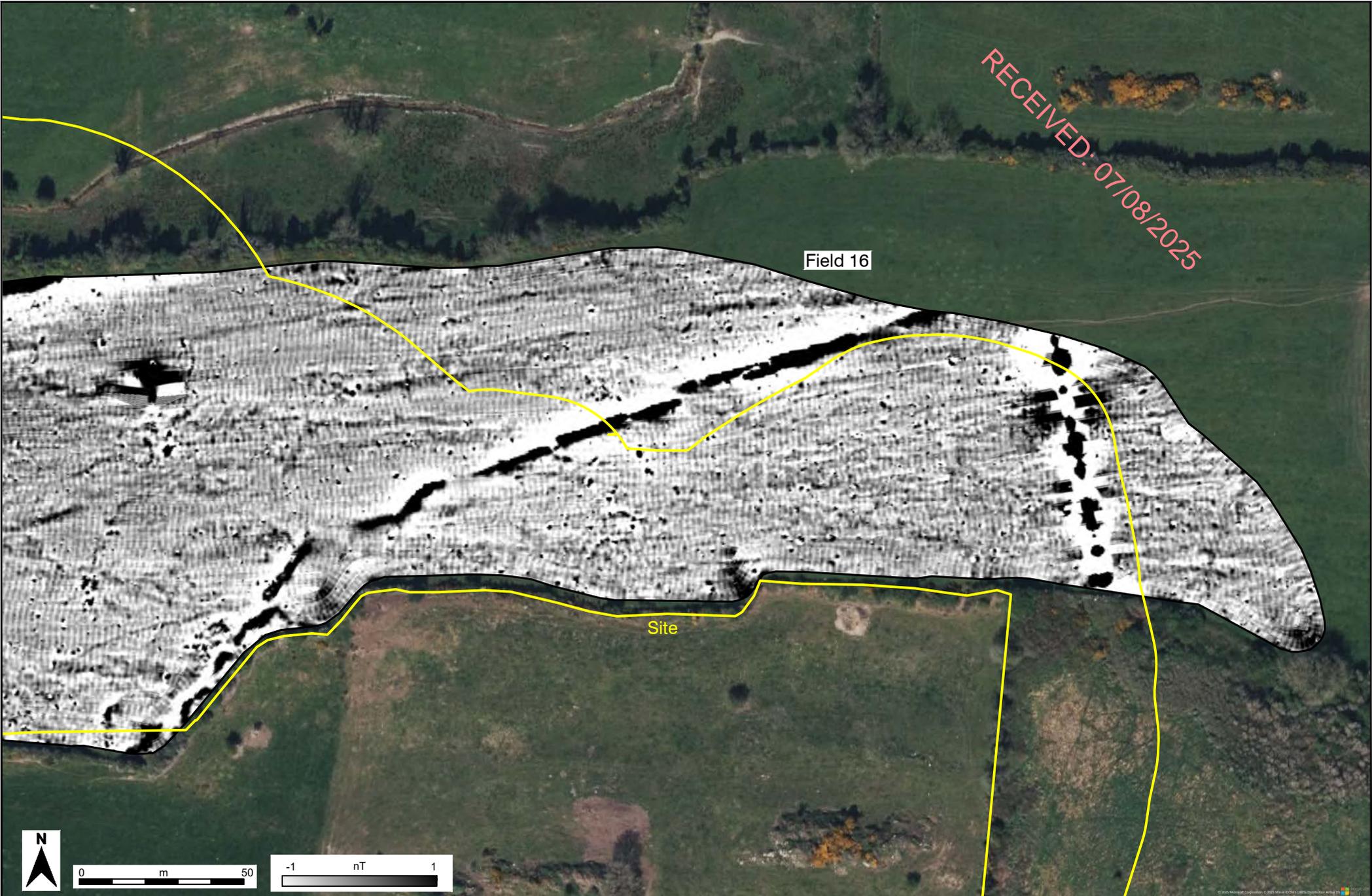
Figure 12 Aerial view of site, showing geophysical survey results in Field 8 (greyscale images)

Scale 1:1,500 @ A4



Project Kellystown Windfarm, Co. Louth	Date May 2025	
Figure 13 Aerial view of site, showing geophysical survey results in Field 9 (greyscale images)		

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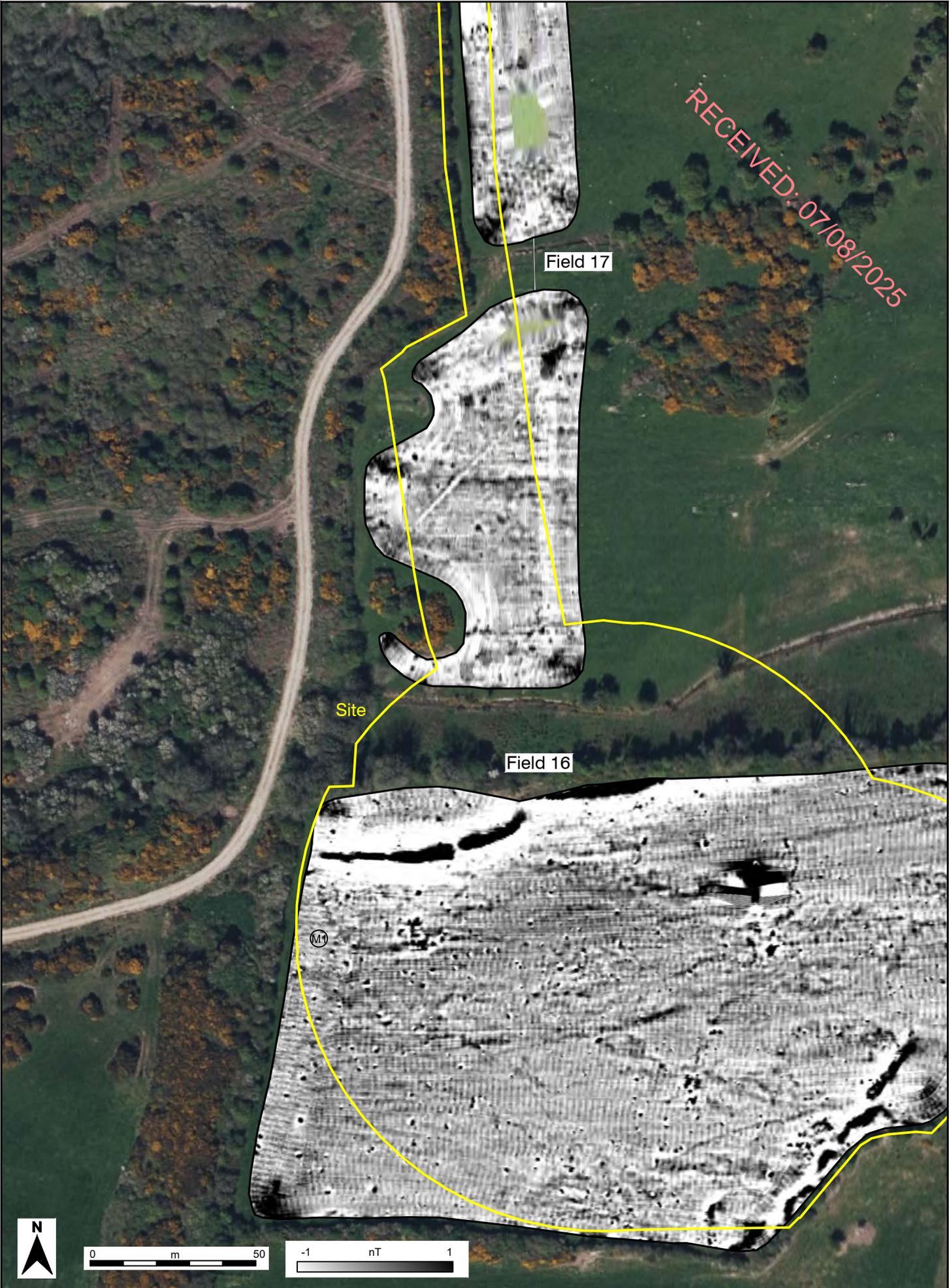
Date May 2025

Drawing No. 2531_C10014

Figure 14 Aerial view of site, showing geophysical survey results in Field 16 (greyscale images)

Scale 1:1,500 @ A4

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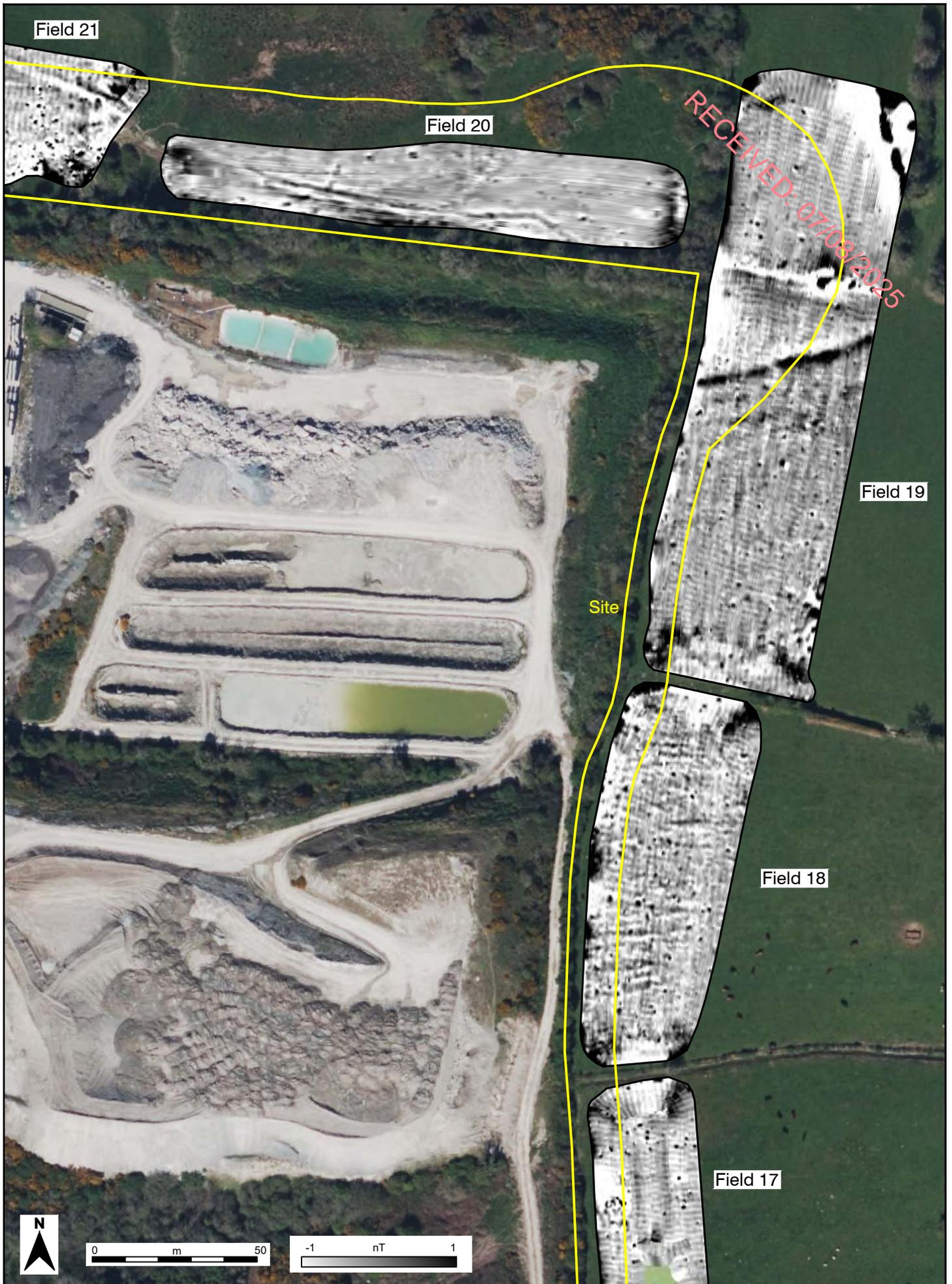
Date May 2025

Figure 15 Aerial view of site, showing geophysical survey results in Fields 16 & 17 (greyscale images)



Scale 1:1,500 @ A4

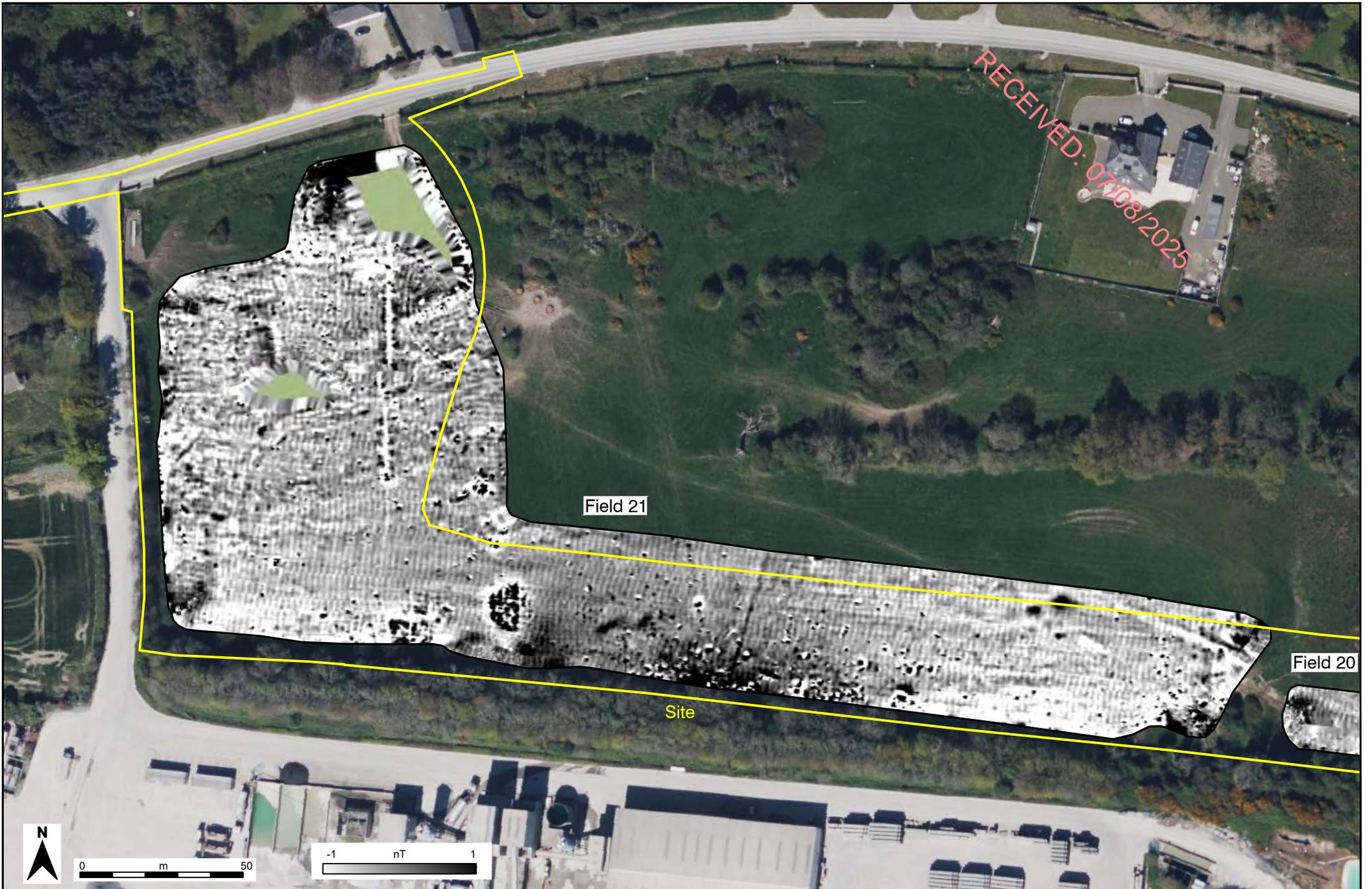
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Project Kellystown Windfarm, Co. Louth

Date May 2025

Figure 16 Aerial view of site, showing geophysical survey results in Fields 17 - 21 (greyscale images)



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Field 21

Field 20

Site



0 m 50

-1 nT 1

Project Kellystown Windfarm, Co. Louth

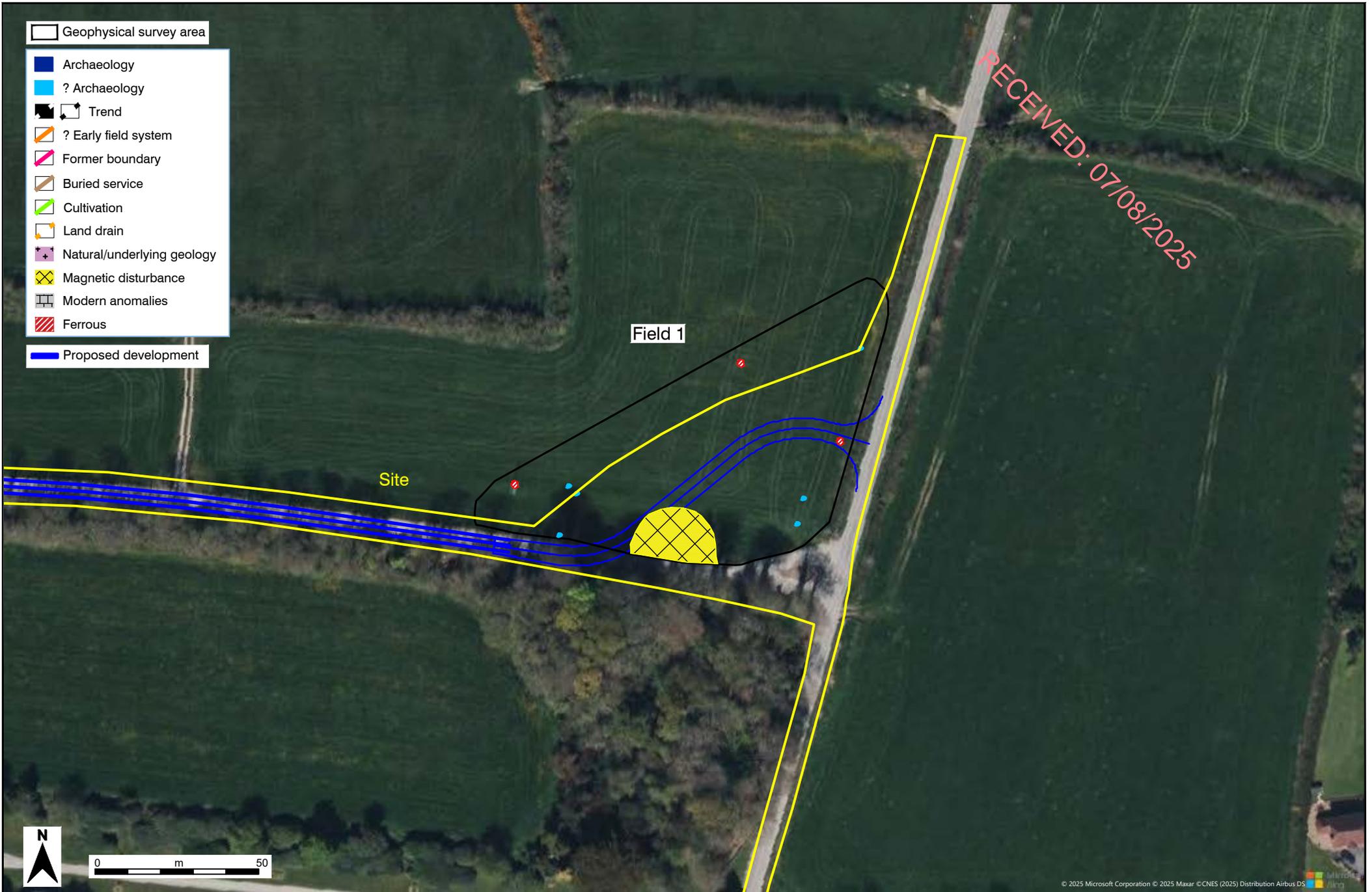
Date May 2025

Drawing No. 2531_C10017

Figure 17 Aerial view of site, showing geophysical survey results in Fields 20 & 21 (greyscale images)

Scale 1:1,500 @ A4





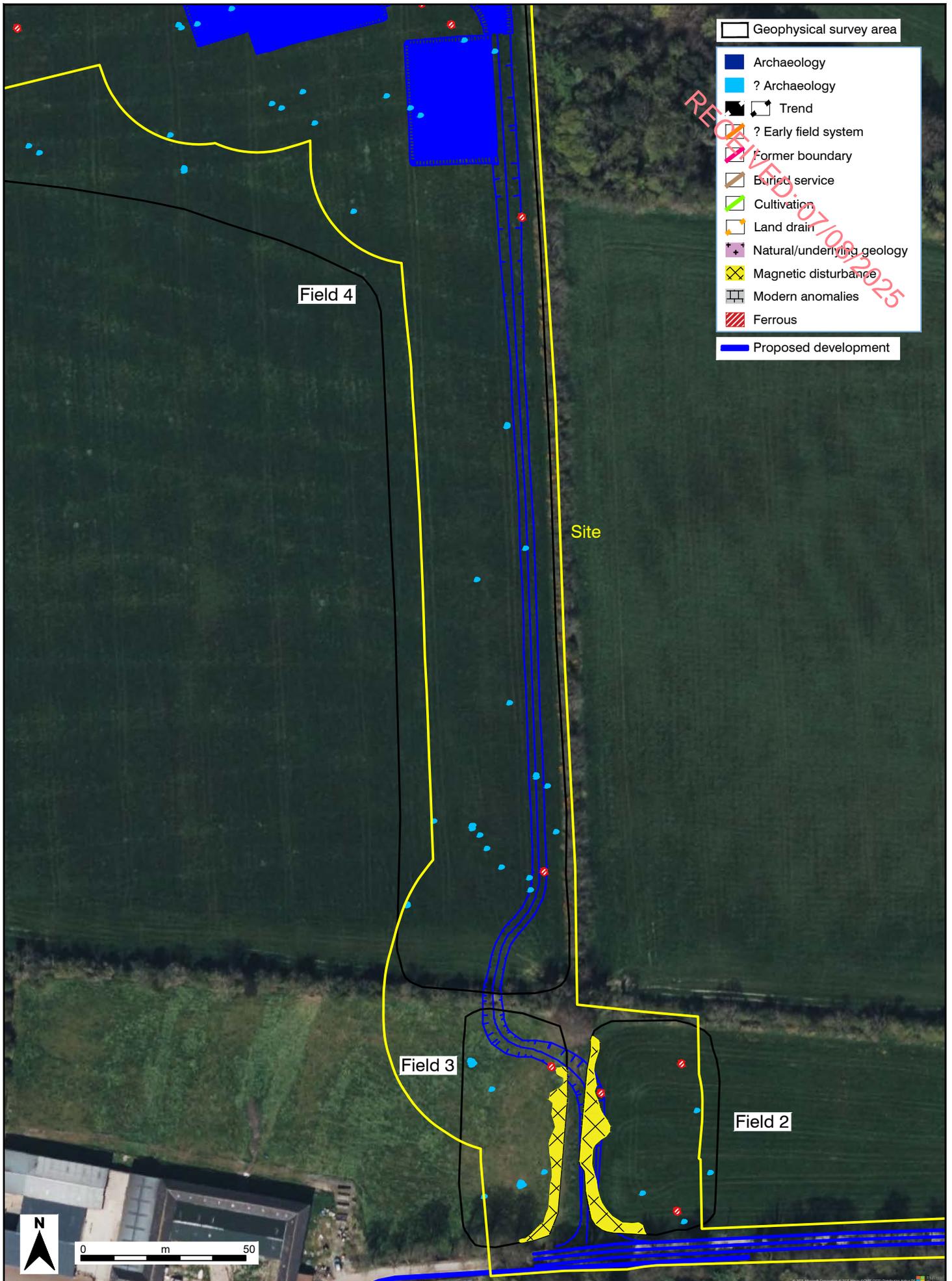
Project Kellystown Windfarm, Co. Louth

Date May 2025

Drawing No. 2531_C10018

Figure 18 Aerial view of site, showing geophysical survey interpretation in Field 1

Scale 1:1,500 @ A4



- Geophysical survey area
- Archaeology
- ? Archaeology
- Trend
- ? Early field system
- Former boundary
- Buried service
- Cultivation
- Land drain
- Natural/underlying geology
- Magnetic disturbance
- Modern anomalies
- Ferrous
- Proposed development

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Date May 2025

Figure 19 Aerial view of site, showing geophysical survey interpretation in Fields 2, 3 & 4



Scale 1:1,500 @ A4

Drawing No. 2531_C10019



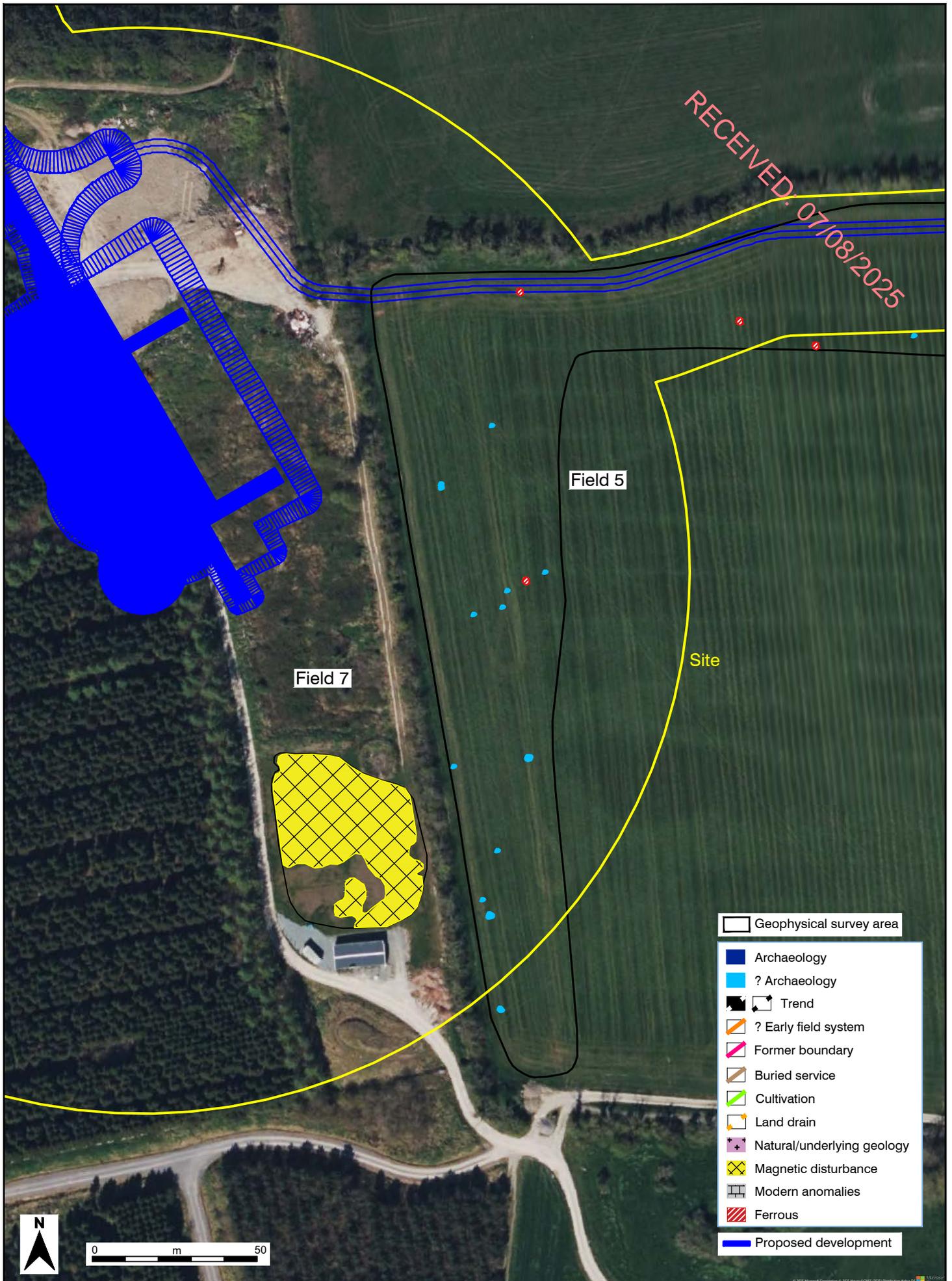
Project Kellystown Windfarm, Co. Louth

Date May 2025

Drawing No. 2531_C1009

Figure 20 Aerial view of site, showing geophysical survey interpretation in Fields 4 & 5

Scale 1:1,500 @ A4



Project Kellystown Windfarm, Co. Louth

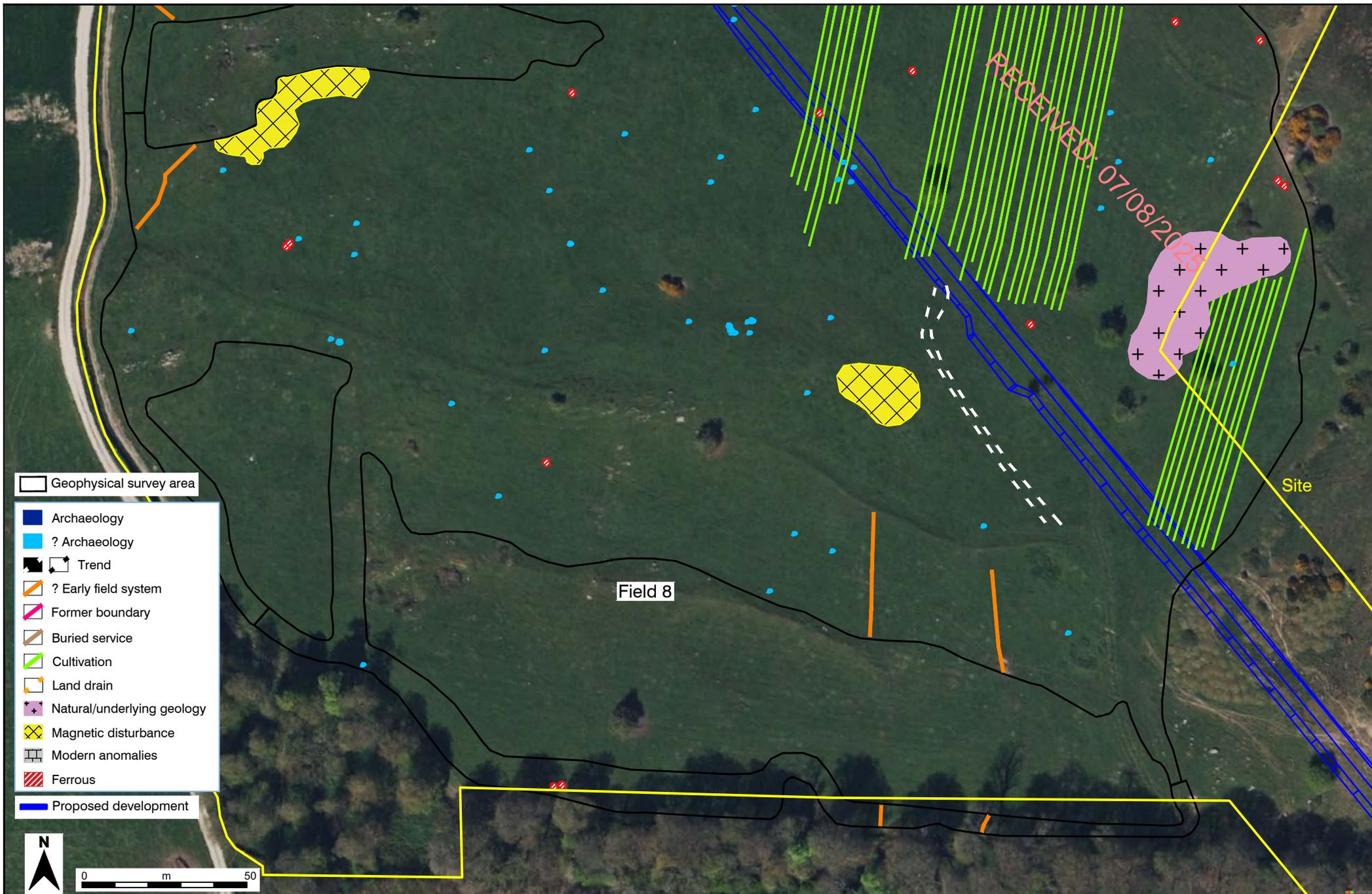
Date May 2025

Figure 21 Aerial view of site, showing geophysical survey interpretation in Fields 5 & 7

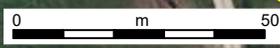


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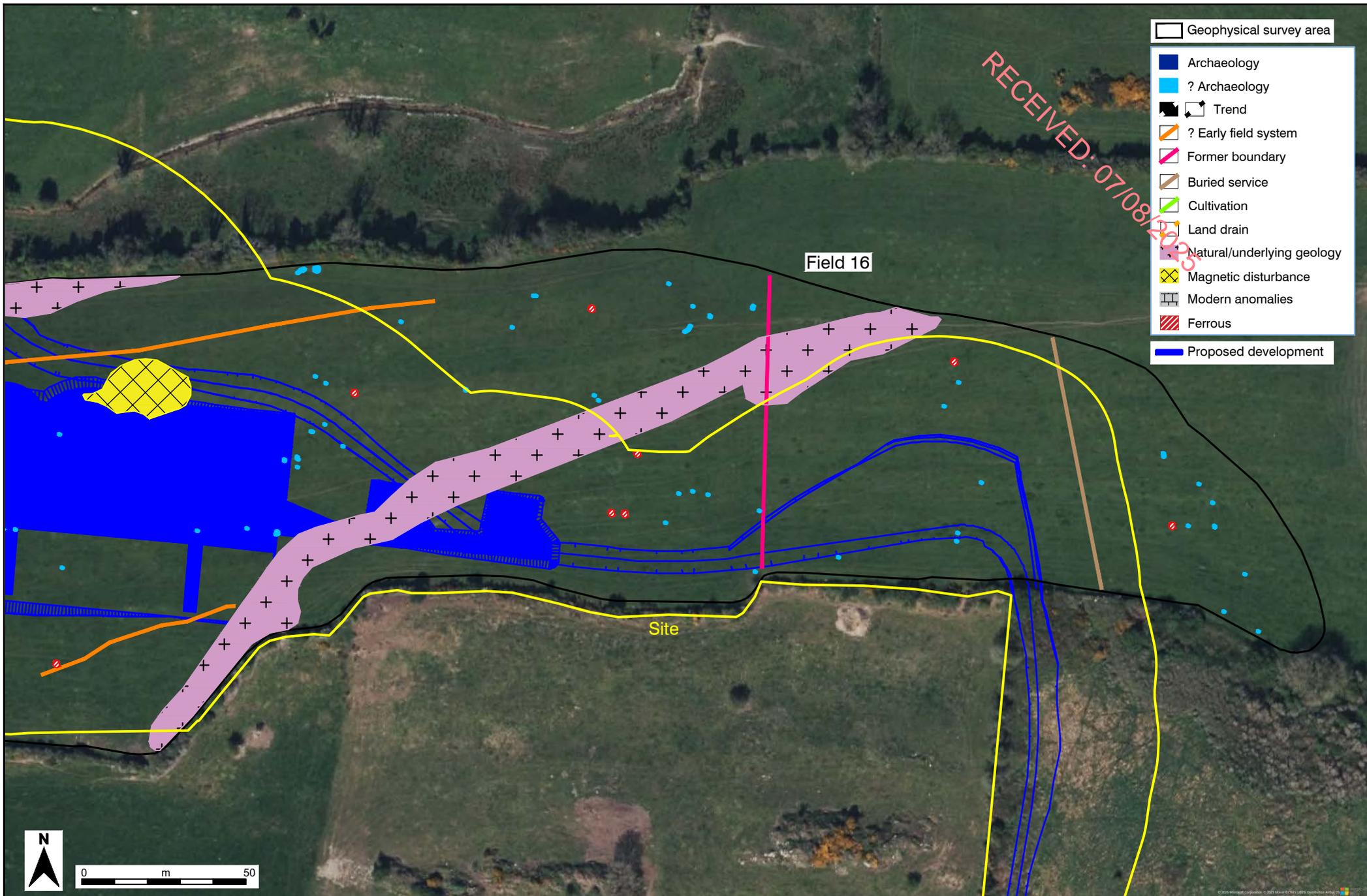
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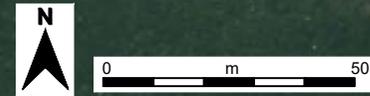
- Geophysical survey area
- Archaeology
- ? Archaeology
- Trend
- ? Early field system
- Former boundary
- Buried service
- Cultivation
- Land drain
- Natural/underlying geology
- Magnetic disturbance
- Modern anomalies
- Ferrous
- Proposed development



Project Kellystown Windfarm, Co. Louth	Date May 2025	Drawing No. 2531_C10022	
Figure 22 Aerial view of site, showing geophysical survey interpretation in Field 8		Scale 1:1,500 @ A4	

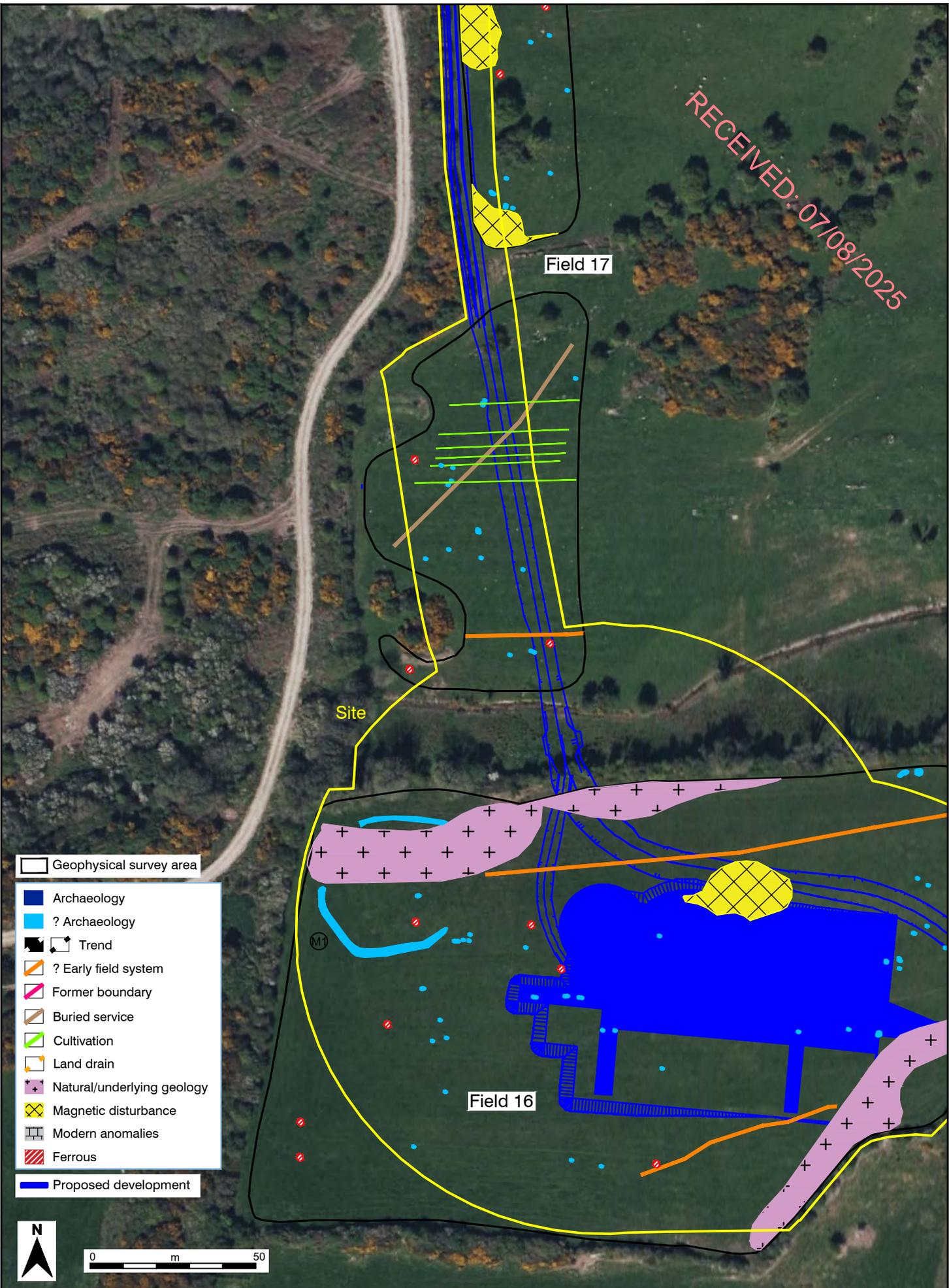


- Geophysical survey area
- Archaeology
- ? Archaeology
- Trend
- ? Early field system
- Former boundary
- Buried service
- Cultivation
- Land drain
- Natural/underlying geology
- Magnetic disturbance
- Modern anomalies
- Ferrous
- Proposed development



Project Kellystown Windfarm, Co. Louth	Date May 2025	Drawing No. 2531_C10025	
Figure 25 Aerial view of site, showing geophysical survey interpretation in Field 16		Scale 1:1,500 @ A4	

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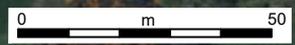


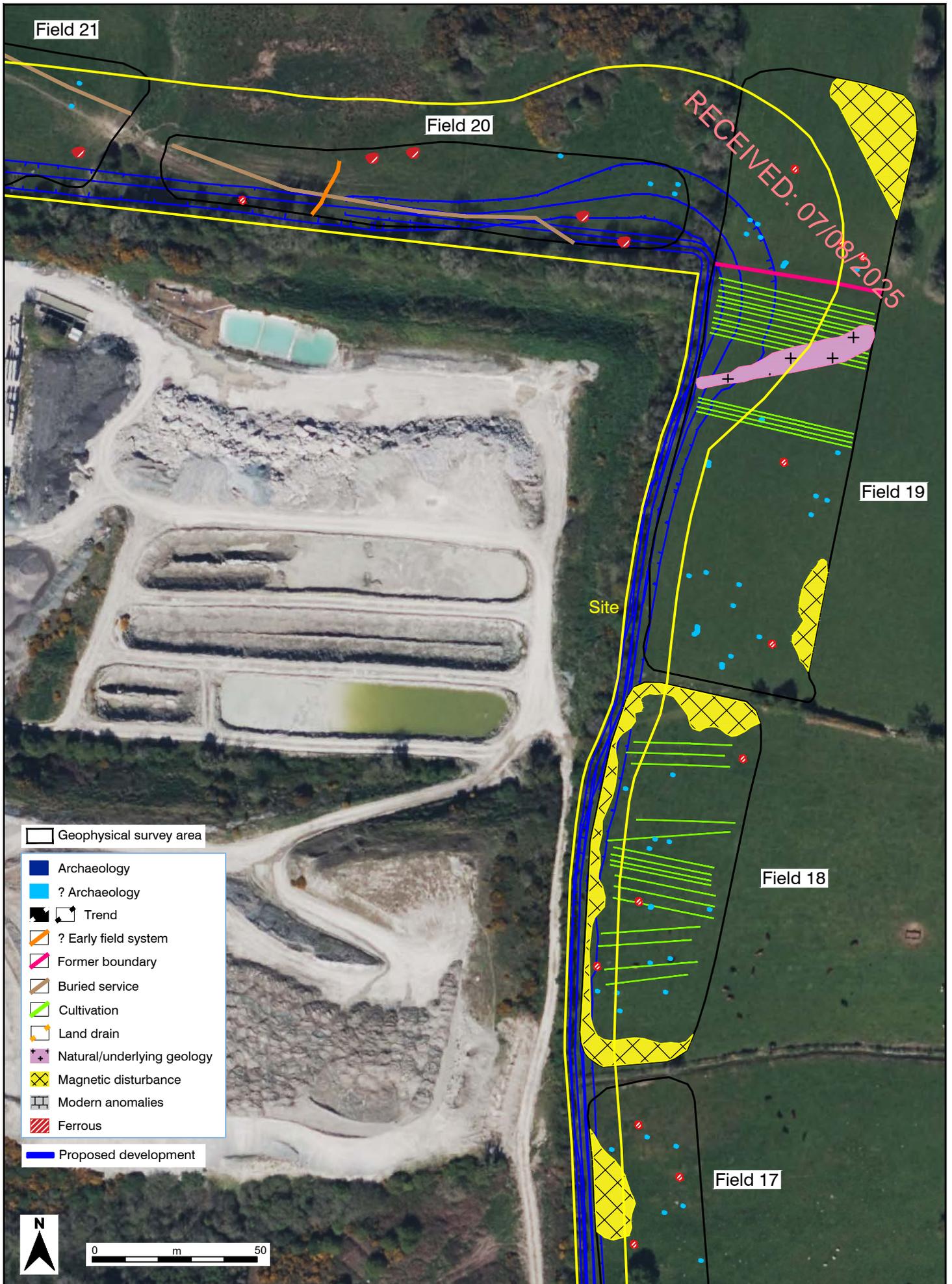
Field 17

Site

Field 16

- Geophysical survey area
- Archaeology
- ? Archaeology
- Trend
- ? Early field system
- Former boundary
- Buried service
- Cultivation
- Land drain
- Natural/underlying geology
- Magnetic disturbance
- Modern anomalies
- Ferrous
- Proposed development

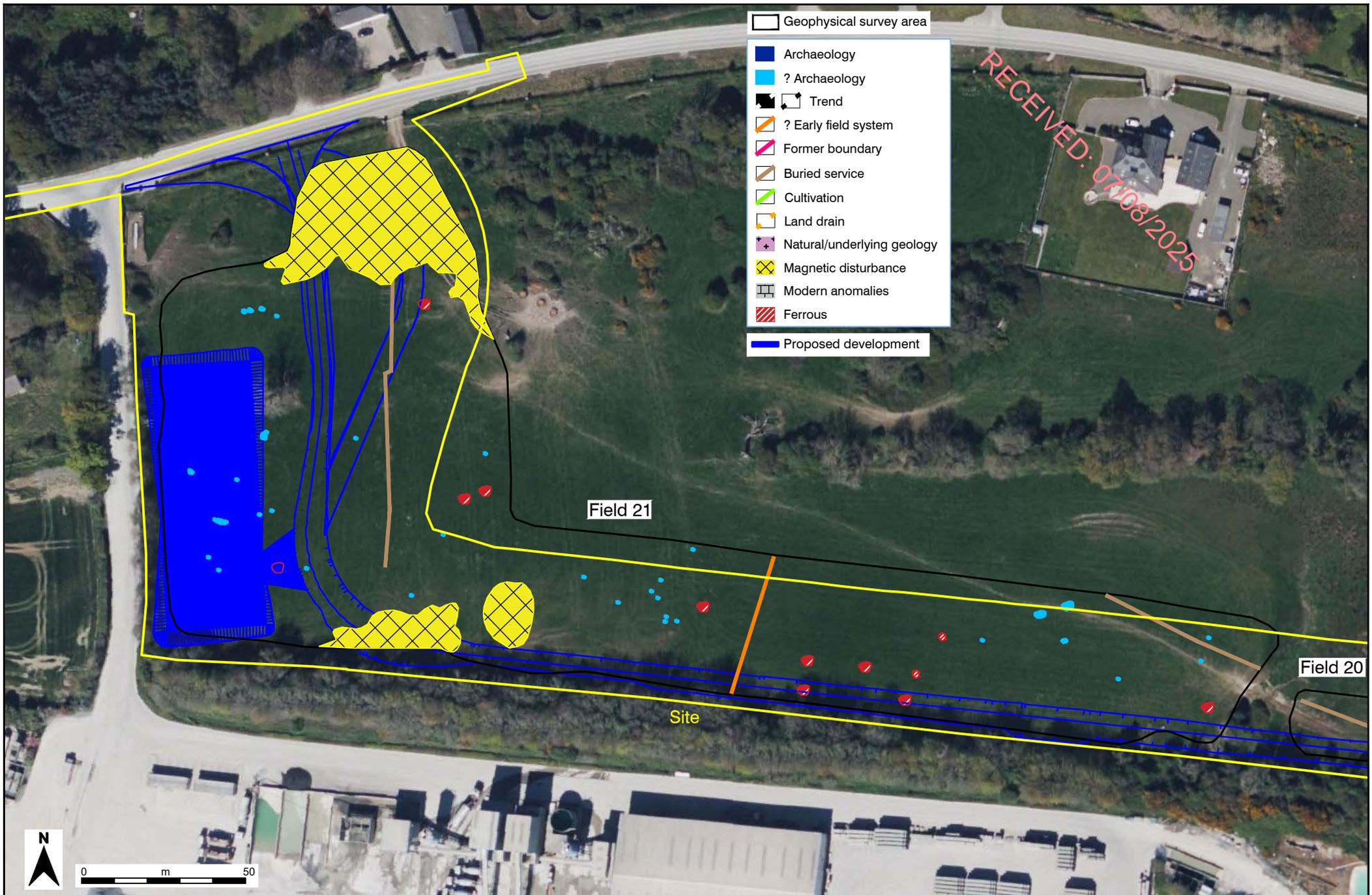




Project Kellystown Windfarm, Co. Louth

Date May 2025

Figure 27 Aerial view of site, showing geophysical survey interpretation in Fields 17-21



- Geophysical survey area
- Archaeology
- ? Archaeology
- Trend
- ? Early field system
- Former boundary
- Buried service
- Cultivation
- Land drain
- Natural/underlying geology
- Magnetic disturbance
- Modern anomalies
- Ferrous
- Proposed development

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Field 21

Field 20

Site



0 m 50