VikingCCS

Viking CCS Pipeline

9.52 Detailed Archaeological Mitigation Strategy - Revision A (Tracked)

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a Harbour Energy Company
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1 Overview of Report

1.1 Archaeological Mitigation Strategy

1.1.1 This document presents a Detailed Archaeological Mitigation Strategy (DAMS) and Overarching Written Scheme of Investigation (OWSI) (together, 'the Strategy') for the Viking CCS Pipeline. The Strategy has been prepared by AECOM ('the Consultant') on behalf of Chrysaor Production (U.K.) Limited, a Harbour Energy group company ('the Client'), in accordance with Draft Mitigation Register reference number D2 of the Draft Construction Environmental Management Plan (CEMP) (Environmental Statement Volume IV – Appendix 3-1: Draft CEMP (Document Reference: N070008/APP/6.4.3.1) [REP4-027]).

1.2 Project Background

1.2.1 The Viking CCS Pipeline ('the Proposed Development') comprises a new 24 inch (") (609 mm) diameter onshore pipeline of approximately 55.5 km in length, which will transport Carbon Dioxide (CO_2) from the Immingham industrial area to the Theddlethorpe area on the Lincolnshire coast, where it will connect into the existing 36 " (921 mm) diameter offshore LOGGS pipeline. The Proposed Development is an integral part of the overall Viking CCS Project, which intends to transport compressed and conditioned CO_2 received at a facility at Immingham to store in depleted gas reservoirs under the Southern North Sea. The offshore elements of the Viking CCS Project, including the transport of CO_2 through the LOGGS pipeline to the Viking gas fields under the North Sea, are subject to a separate consenting process.

1.2.2 The key components of the Proposed Development comprise:

- Immingham Facility;
- Approximately 55.5 km 24 " onshore steel pipeline (including cathodic protection);
- Three Block Valve Stations;
- Theddlethorpe Facility;
- Existing LOGGS pipeline and isolation valve to the extent of the Order Limits at Mean Low Water Springs (MLWS);
- Permanent access to facilities;
- Mitigation and landscaping works;
- Temporary construction compounds, laydown, parking and welfare facilities; and
- Temporary access points during construction.

1.2.3 Further details of each element of the Proposed Development are set out in Chapter 3 of the Environmental Statement (ES) (Application Document 6.2.3 ES Volume II – Chapter 3: Description of the Proposed Development) [APP-045].

1.2.4 The Proposed Development extends across the administrative areas of Lincolnshire County Council, North Lincolnshire Council, North East Lincolnshire Council, West Lindsey District Council and East Lindsey District Council (West Lindsey District Council and East Lindsey District Council are located within the Lincolnshire County Council administrative boundary).

1.2.5 For the purposes of the Strategy, the corridor for archaeological mitigation ('the Site') is defined by the DCO Site Boundary (the Order limits), which has been developed around an indicative pipeline route. The length of the indicative route within the DCO Site Boundary is approximately 55.5 km, running from Immingham to Theddlethorpe, and areas for temporary compounds. Within the DCO Site Boundary, archaeological mitigation will generally target land at the Immingham Facility and Theddlethorpe Facility; the standard working width of the pipeline spread of 30 m; locations of above ground installations (Block valves); and temporary construction compounds and laydown, parking, and welfare areas. In specific areas the working width of the pipeline spread would be reduced to 10 m (for example, where hedgerows or trees are to be retained, or at sensitive water crossings) or increased to up to 50 m (for example, at major crossings such as those requiring HDD or auger boring).

1.3 Structure of this Document

1.3.1 **Part One** of this document comprises the **Detailed Archaeological Mitigation Strategy** (DAMS). It describes the principles to be applied when undertaking archaeological mitigation for the Proposed Development and describes strategies and approaches for the protection of archaeological remains and for the investigation, recording and analysis of archaeological remains. It also contains an overview of the heritage baseline and a summary of the results of the programme of archaeological evaluation surveys, relevant research themes and period-based questions from the regional research agenda (Knight et. at., 2012). Provisional 'action areas' ('sites') where archaeological mitigation is required are identified in **Table 3-2** and shown on **Figures 1 and 2**.

1.3.2 **Part Two** contains the **Overarching Written Scheme of Investigation** (OWSI) which sets out the approach to mitigation, outline method statements for the required approaches and mitigation techniques, requirements for sign-off of archaeological action areas ('sites') to construction, and requirements for the reporting / publication of fieldwork results. which sets out the archaeological mitigation measures which shall form the basis of the works to be detailed in ~~each~~ Site Specific Written Schemes of Investigation (SSWSIs), the procedures for communication between the interested parties, monitoring and reporting, and for completion of the archaeological works. It also contains a description of the reporting and archiving requirements.

1.3.3 **Part Three** comprises References (section 9 of this document), and Appendices as follows:

- Appendix A: Standards and Guidance;
- Appendix B: Outline Public Archaeology and Community Engagement Strategy; and
- Appendix C: Template Completion Statement.

1.3.4 **Part Four** comprises figures showing the locations of the provisional action areas for archaeological mitigation and the extent of completed trial trenching.

PART ONE – DETAILED ARCHAEOLOGICAL MITIGATION STRATEGY

1.4 Introduction

1.4.1 This Strategy sets out the scope and methods for the planning and implementation of essential archaeological mitigation works associated with the construction of the Viking CCS Pipeline ('the Proposed Development'). These mitigation works include the avoidance and protection of archaeological remains in situ, and the archaeological investigation and recording of remains where avoidance is not possible.

1.4.2 The archaeological investigation components of the mitigation strategy described in this document will be implemented by an archaeological contractor ('the Archaeological Contractor') to be appointed on behalf of the Client. The pipeline construction contractor appointed by the Client will be responsible for implementation of measures not involving archaeological fieldwork, including for example the installation, maintenance and, following completion of construction works, removal of protective measures at areas where archaeological remains are to be retained in situ. It shall be the responsibility of the Archaeological Contractor to produce a Site Specific Written Scheme of Investigation (SSWSI) in accordance with the generic archaeological methodologies contained in the OWSI set out in Part Two of this Strategy, in respect of each location where archaeological mitigation is required (see section 1.3 of this document, Roles and Responsibilities).

1.4.3 The Strategy covers the whole Proposed Development delivery period from the Pre-Construction Activities stage through to the completion of the Construction Works Stage, including the detailed design. No archaeological mitigation is required in respect of the Operation or Decommissioning stages of the Proposed Development (see ES paragraphs 8.810 and 8.8.11) [APP-050, AS-023].

1.4.4 Reporting and dissemination of the results of the archaeological investigations are also ~~considered~~ included in the Strategy (post-excavation assessment and analysis, publication and archiving), which may continue beyond the Construction Works stage of the Proposed Development.

Status of this Document

1.4.5 **This draft Strategy is a live document. Once all evaluation stages are complete, the Strategy will be comprehensively updated in consultation with the Viking CCS Heritage Consultees and will form part of the final CEMP for approval by the relevant local planning authorities.**

~~1.4.5~~1.4.6 Development and implementation of the Strategy is a requirement of the Draft Construction Environmental Management Plan (CEMP) (ES Volume IV – Appendix 3-1: Draft CEMP (Document Reference: N070008/APP/6.4.3.1) [REP4-027]): Draft Mitigation Register reference number D2:

- D2 - Develop and implement a detailed archaeological mitigation strategy in consultation with the County Archaeologist (or equivalent), likely to include archaeological mitigation measures such as: surface artefact collection / test pitting / metal detection where required in advance of archaeological excavation and recording; topographic survey of earthworks to allow reinstatement works post-construction; archaeological excavation and recording in advance of construction; targeted archaeological monitoring during construction works; geoarchaeological investigation; and protection of remains within working areas and preservation of archaeological remains in situ. Mitigation will be carried out in accordance with a Written Scheme of Investigation which will be produced in consultation with the County Archaeologist (or equivalent).

~~1.4.6~~1.4.7 The draft Strategy has been prepared following desk-based assessment and completion of several phases of archaeological evaluation including geophysical survey and aerial photograph and LiDAR analysis. A programme of trial trenching is ongoing at the time of preparation of this draft Strategy and the preliminary results of this have also informed development of the draft Strategy. The Strategy will be finalised through ongoing consultation with Historic England and the local authority Archaeological Officers (collectively, 'the Viking CCS Heritage Consultees') (see section 1.3 of this document, Roles and Responsibilities). ~~It~~ The Strategy both accords with and supersedes the Outline Archaeological Mitigation Strategy contained within the ES (ES Volume II - Chapter 8: Historic Environment. Document Reference: EN070008/APP/6.2.8 [APP-050]).

1.4.8 This document will be submitted to the Secretary of State to be certified as the "outline archaeological written scheme of investigation" under Article 44(1)(m) of the draft DCO [REP4-050]. The final DAMS on completion of all phases of archaeological evaluation will be agreed with the Viking CCS Heritage Consultees. ~~and~~ The SSWSIs to be developed from the DAMS will be submitted to the relevant planning authority for approval in accordance with R~~r~~equirement 10 of the draft DCO.

Purpose of the Strategy

~~1.4.7~~1.4.9 The purpose of this Strategy report is to set out the scope, guiding principles and methods for the planning and implementation of essential archaeological mitigation works associated with the design and construction of the Proposed Development, following the approach to mitigation set out in the ES submitted with the DCO application (ES Volume II - Chapter 8: Historic Environment (Document Reference: EN070008/APP/6.2.8) [APP-050]). It details the archaeological mitigation proposed to reduce the effect of the Proposed Development on the archaeological resource, either by protection/preservation of archaeological remains wherever possible or, where remains cannot be preserved, through a structured programme of archaeological investigation to mitigate the loss. This document presents the approach to consultation and approvals, project management, and the post-excavation analysis and publication stages.

~~1.4.8~~1.4.10 The Proposed Development passes through a landscape of high archaeological significance and the intention is to apply a high, practicable standard of mitigation and a question-based research strategy that places the significance of the archaeological resource at the centre of decision-making both at design and implementation phases.

~~1.4.9~~1.4.11 The Strategy summarises the extent of previous investigations and describes the proposed mitigation works and methods that will be implemented, based on the results of completed archaeological surveys and evaluation associated with the Proposed Development.

~~1.4.10~~1.4.12 A Written Scheme of Investigation for Archaeological Evaluation agreed with the Viking CCS Heritage Consultees was submitted as Appendix 8-3 of the ES (ES Volume IV – Appendix 8-3: WSI for Archaeological Evaluation Document Reference: EN070008/APP/6.4.8.3) and subsequently updated to include written schemes of investigation prepared by Wessex Archaeology for trial trenching (Annex D) and metal detecting (Annex E) [REP2-016 / 017]. The archaeological evaluation strategy comprises four principal approaches, building on the previous stages of desk-based research, aerial photograph assessment and LiDAR analysis, and non-intrusive geophysical survey that were undertaken to inform the DCO Application:

- earthwork survey;
- metal detector survey;

- archaeological trial trenching; and
- geoarchaeological investigation.

~~1.4.11~~1.4.13 The programme of archaeological trial trenching commenced in April 2024 and is ongoing subject to land access agreements.[1] The results of the ongoing archaeological trial trenching will inform and be incorporated into this Strategy~~, where these are available~~ prior to finalisation of the agreed Strategy for approval under the DCO.

1.5 Roles and Responsibilities

Implementation of the Strategy

1.5.1 The Archaeological Contractor to be appointed on behalf of the Client will be responsible for the delivery of the archaeological mitigation programme (archaeological works on-site and off-site, throughout the pipeline construction programme), as set out in this Strategy. This responsibility will include all on-site and off-site works, including preparation of Site Specific Written Schemes of Investigation (SSWSI) and, where relevant, Method Statements (MS).

1.5.2 The Client's Project Manager and Supervisor (the Archaeological Clerk of Works: see section 4.4 of this Strategy) will be responsible for oversight of the archaeological mitigation programme (including implementation and monitoring of any measures to protect/preserve in situ archaeological remains that do not involve fieldwork by an archaeological contractor, throughout the pipeline construction programme) and will be the principal point of contact for advisory groups, monitors and curators. Further details are set out in Chapter 6 of this document, Communications, Monitoring, Sign-off for Completed Archaeological Works and Approvals.

Monitoring of Archaeological Work

1.5.3 The key heritage stakeholders are Historic England and the archaeological advisors to East Lindsey District Council, Lincolnshire County Council, North Lincolnshire Council and North East Lincolnshire Council (collectively known as the 'Viking CCS Heritage Consultees'), who act as statutory consultees. References within this Strategy to consultation with the Viking CCS Heritage Consultees means consultation with the archaeological advisor to the relevant local planning authority (depending on the location of the relevant archaeological works) and, where relevant, Historic England, in accordance with the procedures set out Chapter 6 of this document, Communications, Monitoring, Sign-off for Completed Archaeological Works and Approvals.

1.5.4 The local planning authorities have a statutory role in relation to the approval of each SSWSI and Method Statement, depending on the location of the relevant archaeological works. Throughout the lifecycle of this project, the archaeological fieldwork and reporting will be closely monitored to ensure that it is being carried out to the required standard and that it will achieve the desired aims and objectives. The Viking CCS Heritage Consultees will attend site meetings (at their discretion) to review the progress and results of the fieldwork and to inform sign-off of sites by the relevant local authority Archaeological Officer prior to construction (see Chapter 6 of this document, Communications, Monitoring, Sign-off for Completed Archaeological Works and Approvals).

[1] It should be noted that archaeological evaluation at the Immingham Facility was completed and a mitigation strategy agreed as part of a separate planning application, accordingly the results of the evaluation and the same archaeological mitigation approach are incorporated into this Strategy.

1.6 Scope of the Strategy

1.6.1 The Strategy sets out the framework for archaeological mitigation for agreement with the Viking CCS Heritage Consultees. In format and content this document conforms with current good practice and takes account of guidance outlined in:

- Overarching National Policy Statement for Energy (EN-1) (Department for Energy Security & Net Zero, 2023a);
- National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Department for Energy Security & Net Zero, 2023b);
- National Planning Policy Framework (NPPF) (2023);
- Planning Practice Guidance – Conserving and enhancing the historic environment (Ministry of Housing, Communities & Local Government, 2019).
- Management of Research Projects in the Historic Environment (Historic England, 2015a).
- Universal guidance and standards issued by the Chartered Institute for Archaeologists (CIfA): archaeological field evaluation (CIfA, 2023a and 2023b), archaeological excavation (CIfA, 2023c and 2023d), archaeological monitoring and recording (CIfA, 2023e and 2023f), the collection, documentation, conservation and research of archaeological materials (CIfA, 2020a); and the creation, compilation, transfer and deposition of archaeological archives (CIfA, 2020b);
- Historic England have also issued a variety of guidance notes for environmental archaeology, human remains, scientific dating, preservation of archaeological remains and archaeological conservation (see Appendix A).

1.6.2 References in this DAMS should be taken to refer to the current published policy, standards and guidance documents, as may be updated from time to time.

1.6.3 The Strategy and each SSWSI will be prepared in consultation with the Viking CCS Heritage Consultees and each SSWSI will be approved by the relevant local authority Archaeological Officer prior to the start of the fieldwork to which it applies.

2 Historic Environment Background and Archaeological Research Agenda

2.1 Introduction

2.1.1 The historic environment baseline for the Proposed Development was informed by desk-based assessment, aerial photographic assessment and LiDAR analysis, and geophysical survey, as reported in the ES and technical reports, as follows:

- ES Volume IV – Appendix 8-1: Historic Environment Desk Based Assessment. (Document Reference: EN070008/APP/6.4.8.1) [APP-089].
- Environmental Statement Volume III – Figures: Part 2 of 3. (Document Reference: N070008/APP/6.3.2) [APP-065].
- Environmental Statement Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2) [APP-090].
- Supplementary Environmental Information: Geophysical Survey Report and Assessment Update (Document Reference: EN070008/EXAM/9.7) [REP1-043].

2.1.2 The ES divided the Proposed Development into five sections (Sections 1 to 5) from north to south that broadly reflect the landscape areas through which the pipeline passes to ensure that the baseline descriptions are relevant to each area. The factors including geography, geology and topography which have influenced the character of the areas are also likely to have been important factors in the settlement and exploitation of the landscape since prehistoric times.

2.1.3 The five sections along the Proposed Development between the Immingham Facility and the Mean Low Water Springs (MLWS), near the former Theddlethorpe Gas Terminal (TGT) are as follows (north to south):

- Section 1 - Rosper Road (Immingham) to A180 road (including the Immingham Facility and the proposed North Compound);
- Section 2 - A180 road to A46 road (including Washingdales Lane Block Valve Station);
- Section 3 - A46 road to Pear Tree Lane (including the proposed Central Compound and Thoroughfare Block Valve Station);
- Section 4 – Pear Tree Lane to Manby Middlegate (B1200) (including Louth Road Block Valve Station); and
- Section 5 – Manby Middlegate (B1200) to Theddlethorpe and down to Mean Low Water Springs (MLWS) (Including the Theddlethorpe Facility and the proposed Southern Compound).

Updated HER search

2.1.4 An updated search of the North Lincolnshire, North East Lincolnshire and Lincolnshire County Council Historic Environment Records (HERs) was undertaken in summer 2024. This identified 24 additional data entries since the baseline searches in August 2022, as follows.

2.1.5 Within the DCO Site Boundary there are six new HER entries relating to the geophysical survey programme undertaken for the Proposed Development. These new entries relate to

potential archaeological sites assessed in the Supplementary Environmental Information: Geophysical Survey Report and Assessment Update [REP1-043].

2.1.6 Within 500m of the DCO Site Boundary there are six new entries relating to non-designated heritage assets in Section 4 that are assessed in the ES (these entries are assigned multiple new numbers by the HER).

2.1.7 The remaining 12 additional HER entries record events outside the DCO Site Boundary; these heritage assets will not be affected by the Proposed Development.

2.1.8 No new designated heritage assets are recorded in the HER update within 2km (the designated assets study area) or 5km (the wider area for consideration of specific designated heritage assets) since the ES.

Historic Environment Baseline

2.1.42.1.9 The following sections 2.2 to 2.6 of this Strategy provide a summary description of the historic environment baseline along the Proposed Development route ~~(for a detailed description refer to ES Volume IV – Appendix 8-1: Historic Environment Desk Based Assessment (Document Reference: EN070008/APP/6.4.8.1) [APP-089]).~~ drawn from ES Volume IV – Appendix 8-1: Historic Environment Desk Based Assessment (Document Reference: EN070008/APP/6.4.8.1) [APP-089]) and updated to include HER entries added since the ES was compiled, following the updated HER search undertaken in summer 2024 (above). Where relevant, Historic Environment Record (HER) references are included for completeness and given in their full alphanumeric form and where these are within 500m of the pipeline route a UID number has been assigned (identified by square brackets [ ]). (For a complete list of heritage assets refer to Appendix 8-1: Historic Environment Desk Based Assessment, Annex A; and their locations are shown at Annex D [APP-089]).

2.2 Section 1: Rosper Road (Immingham) to A180 Road

Topography and geology

2.2.1 In this section ground levels are generally at and below the 10m contour (contour heights are expressed above Ordnance Datum (aOD)) with slightly higher ground at the western side of the Section. Historically this coastal landscape strip mainly comprised seasonal saltmarsh grazing utilised by settlements located on the higher ground. At the start of the pipeline route the ground level is around the 5m contour and rises to the 11m contour at Habrough Road (B1210).

2.2.2 Most of the Section is underlain by superficial geological deposits comprising Glacial Till, a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape (diamicton). Tidal Flat Deposits are also present which comprise a consolidated soft silty clay, with layers of sand, gravel and peat. Alluvium is also present along localised watercourse channels around Immingham. These deposits comprise soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. The bedrock geology underlying this Section is Chalk of the Burnham Chalk Formation. Comprising white, thinly-bedded chalk with common tabular and discontinuous flint bands; sporadic marl seams.

Prehistoric (up to AD43) and Roman (AD43-450) periods

2.2.3 Archaeological evidence shows that the Humber estuary has been a key trade and communication route between the North Sea and the Pennines, and also to the Midlands (River Trent), since prehistoric times. Significant palaeo-environmental and archaeological evidence preserved within wetland locations includes Bronze-age boats and fishtraps.

There is also evidence of early settlement on higher, drier land, while the lower wetlands provided fishing and fowling as well as summer grazing for the surrounding settlements.

2.2.4 Research on the Humber wetlands has suggested that at the beginning of the Holocene, the onset of warmer conditions led to the establishment of dense vegetation cover over undulating boulder clay. At the same time, kettle-holes and poorly draining hollows would have allowed the formation of a series of organic peaty sediments and fluctuating sea levels would have led to increasing sedimentation through the process of alluviation and the formation of marshlands (Russell and Russell, 1982; Russell and Russell, 1987; Macklin et al, 2000). The Humber continued to have great importance throughout the Roman and medieval periods for trade and communication and it is possible that on the north bank of the estuary drainage of the marshes began as long ago as the second century AD.

2.2.5 Prehistoric flintwork (waste material and tools) of Late Mesolithic to Early Bronze Age date have been found during investigations including surface artefact collection and excavations [001, 002, 003, 004, 015, 005]. There are other findspots of prehistoric flintwork (waste flakes and cores) in the wider area, south of Station Road (MLS19726).

2.2.6 Archaeological evaluation at the Humber Refinery, c.300 m northeast of the Site Boundary, has recorded evidence of Bronze Age activity and a late prehistoric and Roman settlement with associated evidence for salt-making and iron smelting [006]. Charcoal from a ditch was radiocarbon dated to the Early Bronze Age and sealed beneath 0.4 m of alluvial clay, was a charcoal-rich deposit (burnt stone and charcoal) that was radiocarbon dated to the Late Bronze Age. A spread of burnt material which lay over a possible buried soil was also sealed beneath the alluvium which produced a Middle Bronze Age date. The Iron Age (and early Roman occupation) appears to occupy the driest ground, towards the west of the investigated area. Many of the features coincided with geophysical anomalies (possibly representing Iron Age enclosure ditches) and it is possible that salt making was carried out on the wetter ground to the east.

2.2.7 Although undated deposits, interpreted as the buried shoreline, were recorded east of Rosper Road during archaeological evaluations in 2004 and 2005, trenches in 2004 recorded 1m of alluvium over a peaty deposit and alluvium over deposits of mid-late Iron Age date. In 2005 alluvium which sealed an organic deposit was recorded beneath subsoil [098]. Also, a system of creeks which were detected by geophysical survey are likely to mark a former high-water position.

2.2.8 Close to the northern end of the Site Boundary an archaeological trial trench evaluation in 2016 at Rosper Road identified multiperiod activity, including several Iron Age ditches [007]. An earlier excavation either side of Rosper Road, that was carried out between 2000 to 2002 adjacent to the Conoco Refinery, suggested that the original early Iron Age settlement was located on the lower ground near to a former creek on the shore of the River Humber. There then appears, on the basis of the pottery sequence, to have been a hiatus in the mid- to late Iron Age, and the subsequent late Iron Age and Romano-British settlement, representing possibly a small farmstead, developed on higher ground further north on the palaeo-shoreline, centred around a droveway and a pattern of enclosures [009, 015]. This site has also been recorded on historic aerial photographs [APS_51] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)). Further evidence for Iron Age occupation was found west of Rosper Road, within the Site Boundary, during trial trenching in 2010 related to the A160-A180 road improvements, where two Iron Age ditches were recorded [010].

2.2.9 In 2022, strip map and record excavations were undertaken on an area centred at NGR TA1657 1735 north of the Phillips 66 works at Immingham [753], approximately 450m north-west of the DCO Site Boundary (A. Williams, pers. comm.). The excavations revealed field

system ditches and a possible boundary ditch dated by radiocarbon analysis to the Early to Middle Bronze Age and with some small fragments of prehistoric pottery. The excavations were extended to the west in 2023 where further features indicative of prehistoric and Bronze Age activity were encountered.

~~2.2.9~~2.2.10 Trial trench evaluation carried out in April 2023 for the proposed Humber Zero carbon capture scheme, within the northern extent of the Site Boundary at the proposed pipeline offtake facility at Immingham, has recorded evidence of prehistoric activity and Iron Age/Romano-British occupation along the edge of the former buried shoreline. The evaluation formed part of a program of works, following a geophysical survey and a geoarchaeological borehole survey. A total of 32 trenches were excavated, which identified three areas of archaeological activity at the northwest, northeast and southeast corners of the trenched area, centring on the slightly higher ground within the site. Trenching at the northwestern corner of the evaluation area revealed several ditches containing Romano-British pottery and animal bone, however, the earliest evidence of activity came from a small number of pits found beside a possible palaeochannel which produced late Mesolithic / early Neolithic lithic fragments. At the northeastern corner an alignment of postholes and several small boundary or enclosure ditches were recorded. A concentration of features at the southeastern corner, dated mostly to the Iron Age/Romano-British period, included a large multiphase curvilinear ditch within a possible enclosure, and a series of small ditches possibly associated with a contemporary field system.

~~2.2.10~~2.2.11 In the central part of the evaluation area geoarchaeological boreholes (11 drilled boreholes to a maximum depth of c.6 m below ground level) were used to identify areas of archaeological potential by characterising the probable nature and depth of sub-surface deposits (Historic England, 2022). The deposit sequence recorded included Pleistocene glacial till found between approximately -0.5 m and 3 m OD; the lower elevations traverse the evaluation site from the northeastern boundary, forming a relict coastal inlet which was found to be infilled with intertidal deposits. It is likely that this inlet was open in the Mesolithic to Neolithic periods but has been gradually infilled during the Holocene by alluvium or warp (flooding) deposits which were found across the site. Made ground of up to approximately 1.4 m in thickness was also recorded. A Framework Written Scheme of Investigation submitted to the local planning authority proposes archaeological excavation of an area of approximately 9.16 ha at the site, of which approximately 1.84 ha is coincident with the DCO Site Boundary.

~~2.2.11~~2.2.12 There are several cropmark features of possible Iron Age date, including west of Habrough Road where a linear feature is visible [008] and a series of three possible enclosures [012]. From the wider area a late Iron Age enclosure, which was also visible on aerial photographs, was identified by geophysical survey and trial trenching (MLS1611~~)~~].

2.2.13 Late Roman dated ditches were also recorded north of Marsh Lane (c.100 m north of the Site Boundary) during trial trenching in 2012 and 2013. These are likely to represent a continuation of the small farmstead recorded on the east side of Rosper Road [013] (Glover, 2013 and 2014).

~~2.2.12~~2.2.14 Archaeological evaluation south of Manby Road, South Killingholme in 2016 (ELS4715) identified a possible ring ditch and gully of likely Iron Age date [749] (MLS26984) and undated gullies [750] (MLS26988) immediately west of the DCO Site Boundary. These features may be associated with possible Iron Age or Roman enclosures south of Manby Road, within the DCO Site Boundary (Field 011) [739].

~~2.2.13~~2.2.15 At East End Farm (c.130 m west of the Site Boundary) archaeological geophysical survey has detected a trackway and a complex series of rectangular ditches either side of the trackway. Additional evidence included a walled building which could represent a series

of small Romano-British farmsteads, or a single large farm, or perhaps even a structure of military or ritual origin [016]. Metal detection in the same area also recovered Roman coins and metalwork. Geophysical survey for the Proposed Development [REP1-043] identified a series of possible Roman enclosures, ditches, pits and a double ditched trackway in areas/field numbers 23,24, 25 and 26 [741].

~~2.2.14~~2.2.16 From the wider area a possible droveway and enclosure of likely Roman date are visible on aerial photographs next to Ulceby Road and the woodland known as Sinks Covert (MLS8765). South of East End Farm, and c.75 m west of the Site Boundary, archaeological geophysical survey detected the buried remains of a Roman enclosure northeast of Glebe Farm which is also associated with Roman coins and pottery [014].

~~2.2.15~~2.2.17 A sherd of possible imitation samian pottery has been found within the Site Boundary [017].

~~2.2.16~~2.2.18 Late Iron Age pottery and Roman pottery has also been found west of Habrough Road during archaeological excavations [005]. A large hoard of Roman coins was also discovered by a metal detectorist in the same area [018].

~~2.2.17~~2.2.19 In the wider area there is evidence of a high-status Roman settlement and industrial site at Mauxhall Farm/Stallingborough Interchange (MNL4490, MNL4763). Trial trenching at this archaeological site has revealed a substantial settlement belonging to two main phases (1st to 2nd centuries and 3rd centuries) followed by the site's abandonment (Oxford Archaeology East, 2017; Oxford Archaeology East, 2018; HAP, 2021). The presence of a stone building appears to mark this site out as different from other settlements along the edge of the tidal flats and it has been suggested that it may have functioned as a possible estate centre from which other sites were managed.

Early medieval (450-1066) and medieval (1066-1500)

~~2.2.18~~2.2.20 Evidence of early medieval and medieval occupation tends to be concentrated within and close to the historic settlements that the pipeline route passes, however, the surrounding area also contains evidence for activity and occupation as a result of shifting settlement patterns and landscape changes. Most of the evidence is represented by former cultivation systems, and it is likely that some of these also continued in use until enclosure in the post-medieval period.

~~2.2.19~~2.2.21 Immingham is mentioned in Domesday, the Lindsey Survey (c.1115) and the Early Yorkshire Charters (1100-15) and it formed a small cluster of settlements with place names indicating early Anglo-Saxon settlement [020]. The form of the settlement appears to have been a chain of farmsteads or hamlets laid out along a pair of parallel roads, with a denser core around the parish church. Archaeological trial trenching has recovered early medieval pottery and also pottery of 13th to 14th century and post-medieval date. Alluvial layers show that the area was also prone to flooding and that in some places, which were most vulnerable, was used for seasonal farming activities.

~~2.2.20~~2.2.22 Habrough is also mentioned in various historic documents (Domesday, the Lindsey Survey (c.1115), Assize Rolls (1202), the Valuation of Norwich (1254) and Pipe Rolls (1197) [021]. Originally the parish included a large, detached section of coastal marshland, Habrough Marsh (now a part of Immingham). The village comprised of two settlement cores with dispersed occupation between them. The eastern core contains the church and at least one moated manorial site and appears to have been laid out along a single road. The western core contains post-medieval Newsham Farm (settlement appears to have formed around a small grid like system of roads without an obvious topographic influence).

~~2.2.21~~2.2.23 Settlement evidence has been identified within and surrounding Immingham. The scheduled Manor Farm medieval moated site is located in North Killingholme and was occupied into the post-medieval period [027]. A second moated site south-east of North Killingholme [679] consisting of a double island with internal ditches has been extensively studied through a series of archaeological investigations.

~~2.2.22~~2.2.24 A possible area of medieval settlement is located northeast of Houlton's Covert, from fieldname evidence, which may correspond to the small close shown on Russell's pre-enclosure map of Killingholme, on the edge of Summergates [025]. The possible remains of a shrunken medieval village have been found at South Killingholme [028], c.270 m north of the Site Boundary, comprising a rectilinear enclosure, ditches and ridge and furrow (visible on aerial photographs but now largely built over, although elements of the site may survive). A possible medieval moated site was found during an archaeological evaluation and excavation west of Luxmore Farm (complex of ditches and pits that respected Immingham Road) [031].

~~2.2.23~~2.2.25 A series of linear earthwork features (drainage systems, trackways and enclosures) at Homestead Park, Immingham [034] (c.486 m southeast of the Site Boundary) is suggestive of medieval settlement. Waterlogged deposits of possible late medieval origin were recorded during monitoring in 1994. The site is on the North East Lincolnshire 2016 draft local list of historic assets of special interest.

~~2.2.24~~2.2.26 Evidence of extensive ridge and furrow cultivation, of likely medieval to post-medieval date, is visible on aerial photographs at a number of different locations in Habrough [029] [APS_47], also south of Ulceby Road, South Killingholme [026] [APS_49] and at Immingham [030] [APS_47]. Archaeological geophysical survey has also identified ridge and furrow at South Killingholme [022] which is also visible as earthworks on historic aerial photographs [APS_52, APS_53]. Additionally, a detailed assessment of aerial photographs has also identified ridge and furrow as earthwork features at the junction of Roxton Road and Stallingborough Road (Immingham Parish), but outside of the Site Boundary [APS_45] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)). It is possible that several of the undated cropmarks visible on aerial photographs in this Section are the truncated remains of ridge and furrow cultivation.

~~2.2.25~~2.2.27 Although there are no identified salterns from within the Site Boundary, salt working was an important local industry along the coastal margins in the medieval and earlier Roman periods and is likely to have been carried out on a seasonal basis (salt extracted from salt-encrusted sand from the foreshore was treated and dumped in large mounds). Eventually as the ground along the foreshore was improved and raised to prevent seasonal flooding the coastline gradually retreated and new salterns advanced seawards.

~~2.2.26~~2.2.28 There are several findspots of medieval pottery recovered during surface collection surveys [023, 032]. The pipeline route passes several designated parish churches which were constructed in the medieval period (Church of St Denys, North Killingholme [036]; Church of St Andrew, Immingham [035] and a medieval churchyard cross base [024]; and Church of St Margaret, Station Road, Habrough [033]).

Post-medieval (1500-1900) and modern (post-1900)

~~2.2.27~~2.2.29 From the 17th century, coastal reclamation, drainage and enclosure had a significant impact on the rural landscape. Flood defences were built to protect the developing towns and industrial areas and warping was introduced by the Dutch in the 18th century. Later, Parliamentary enclosures produced the landscape of regular, geometric fields, mostly enclosed by dykes, with associated large brick-built isolated farmsteads and excavation of brick pits for the extraction of Pleistocene clays.

~~2.2.28~~2.2.30 There are a series of historic roads of post-medieval to modern date in Immingham that are recorded on the early OS maps, including Stallingborough Road [058] and Mill Lane [061], and also Immingham Road, Habrough [062]. It is possible that Roxton Road, Immingham [059] and Habrough Road, Immingham [060] have origins that can be traced back to the medieval period.

~~2.2.29~~2.2.31 The HERs record several landscape features, including an osier bed [040], a possible landscape park in Immingham [037] and historic hedgerows in South Killingholme parish [038, 068]. The Tithe map of Immingham (1841) depicts two former woodland plantations close to the Site Boundary, Spinrosa Holt [651] located beneath the A180 trunk road, and Cherry Holt [652] located east of Immingham Grange. The tithe map also depicts a series of hedgerows that may be regarded as important under the historic criteria set out in the Hedgerow Regulations as forming part of a field system pre-dating the Enclosure Acts [H1-H6] (see ES Volume IV Appendix 8-1: Historic Environment DBA, Annex C) [APP-089], including the parish boundary between Immingham CP and Habrough CP [629] [H6]. Also within Section 1, the pipeline route crosses the parish boundary between South Killingholme and Immingham CP, south of Houlton's Covert, where it follows an unmarked watercourse shown on the corresponding tithe map and OS maps [628].

~~2.2.30~~2.2.32 Historic OS maps also record the presence of several features associated with coastal navigation and transportation, including several lighthouses – Killingholme High Lighthouse, South Killingholme [043]; Killingholme South Low Lighthouse, South Killingholme [044], and Killingholme North Low Lighthouse, South Killingholme [050].

~~2.2.31~~2.2.33 There are numerous post-medieval and later farms/farmsteads in this Section that are either extant or demolished (for example, Glebe Farm [042], Church Farm, Habrough [053], Luxmore Farm, Habrough Road [055], Elm Tree Farm, South Killingholme [056], Willows Farm, Immingham [057] and Mill Farm, South Killingholme [677, 678]), and also rural dwellings / houses (for example, Belmont Cottage [047], The Nook, South Killingholme [048], Churchfield Manor, Immingham [051], Appletree Cottage, Habrough [045], Roxlyn House, Habrough [054] and Ivy Cottage [682]). Other assets include the site of South Killingholme's town hall [680] and the site of a former blacksmiths workshop [681]. These reflect the former agricultural character and rural industries of the area prior to the development of Immingham Docks and the subsequent expansion of the town. A demolished post mill was also located along Mill Lane, Immingham [041]. The Tithe map of Immingham depicts a possible homestead on Mill Lane [650] that is close to the Site Boundary (opposite the post mill).

~~2.2.32~~2.2.34 Several chapels are recorded in this Section that were constructed to serve the local communities; at South Killingholme there is a Baptist Chapel [049], a primitive Methodist Chapel [066] and a Wesleyan Methodist Chapel [676]; the latter is shown on the west side of Town Street on the First Edition Ordnance Survey Map (1887), since destroyed. In the later 19th century village schools were built at Habrough (Immingham Road) [052] and at South Killingholme [067]. Several of the extant buildings are locally listed.

~~2.2.33~~2.2.35 Immingham Dock was established by the Humber Commercial Railway and Dock Company in association with the Great Central Railway (Humber Commercial Railway and Dock Act of 1904, and subsequent amendments). Construction of Immingham Docks began in 1906 and was complete by 1912. Initially the dock exported coal from the coalfields of Derbyshire and Yorkshire via the Humber Commercial Railway (Grimsby District Light Railway was used for contractors' traffic and later for carrying passengers/dock workers) (Grace's Guide, 2020).

~~2.2.34~~2.2.36 A temporary settlement or workers village was established at Immingham (Humberville) comprising of a series of corrugated tin huts (known as Tin Town) for the dock

construction workers [072]. A 20th century railway signal box [077] and an extensive complex of railway lines and sidings were integrated into Immingham dock (London and North Eastern Railway - Immingham Dock Branch) [076]. The Humber Commercial Railway line constructed in 1912 linked the eastern jetty at Immingham Dock with the main Grimsby - New Holland line at Ulceby [080]. Other buildings of early 20th century date include a demolished mission room [069] and school [070], a demolished dwelling [071] on Rosper Road, South Killingholme and a row of demolished terraced houses (Marsh Row) to the south of Marsh Lane, Immingham [079].

~~2.2.35~~2.2.37 From the 16th and 17th centuries defensive structures were constructed to protect the coastline from attack and the threat of invasion. This importance for defence continued into the late-19th century with a coastal artillery battery and minefield control centre built at Paull Point on the north bank of the estuary, followed in the 20th century by a World War 1 acoustic mirror near Kilnsea and two forts at the estuary mouth.

~~2.2.36~~2.2.38 During World War 1 Immingham Docks was a base for British D-class submarines. Following the end of World War 1 trade declined (as it did elsewhere along the east coast), including demand for shipping services and new ships. Immingham Docks was subsequently used for cruise ships in the 1930s, including vessels of the Orient Steam Navigation Company, White Star Line and Blue Star Line. World War 2 revived the dock's prospects but, together with other ports along the east coast such as Hull, it became the target of bombing raids.

~~2.2.37~~2.2.39 During World War 2 Immingham Docks became a naval base and the headquarters for the Royal Navy on the Humber. A series of anti-aircraft batteries and bombing decoys were built to protect the docks and nearby military airfields from attack. Several types of World War 2 military installations are recorded within this Section, including heavy anti-aircraft battery installations at Immingham [075] and a searchlight emplacement at North Killingholme [082] and aircraft obstructions that are now levelled at Immingham [078]. A possible bomb crater was also identified on aerial photographs at South Killingholme [081]. In the wider area were former barrage balloon sites (MNL4651, MNL4684, MNL4675), other military buildings/installations (MNL4644, MNL4689) and another anti-aircraft battery (MLS17455). A War Memorial dedicated to the fallen of World War 1 was erected in 1925 at the junction of Humberville Road and Pelham Road, Immingham [073], the fallen from World War 2 being added to it.

~~2.2.38~~2.2.40 In the second half of the 20th century the docks expanded with the construction of east and west jetties and the addition of several deep-water jetties for bulk cargo. Immingham Oil Terminal jetty was also constructed at this time on the banks of the Humber west of the dock entrance (1969), and the Immingham Bulk Terminal was commissioned in 1970 for the export of coal and the import of steel. In 1985 the Immingham Gas Jetty was opened, handling liquid petroleum gas, and thereafter extensions to these facilities were added, including new terminals and roll-on/roll-off facilities during the 21st century, to improve connections to Europe and to develop port infrastructure and associated facilities and to facilitate the export of bulk goods.

~~2.2.39~~2.2.41 A modern landfill site is recorded on the HER at Mill Lane, Immingham [074].

Undated Assets

2.2.42 There are several heritage assets that are undated, and which are mostly visible on aerial photographs as cropmarks. An undated possible square enclosure, that is now beneath the Immingham CHP Plant, was identified as a cropmark [088] and there are several other undated cropmark features (possible rectangular enclosures, ring ditches, pits and linear features) south of Ulceby Road [089, 090, 091, 092, 096]. Also, immediately next to the

A180 Immingham Bypass a former road is visible as a cropmark [APS_46] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)) [APP-090], and immediately west of Manby Road (A1173) and partially within the Site Boundary is an undated ditch also visible on historic aerial photographs [APS_50]. An undated possible ring ditch and gully [749] (MLS26984) and undated gullies [750] immediately west of the DCO Site Boundary south of Manby Road, South Killingholme may be associated with possible Iron Age or Roman enclosures south of Manby Road, within the DCO Site Boundary (Field 011) [739] and are therefore discussed above (paragraph 2.2.14)

~~2.2.40~~2.2.43 Archaeological geophysical survey in South Killingholme detected a series of linear anomalies at East End Farm that are undated [086] and an undated linear feature, west of Rosper Road [087].

2.3 Section 2: A180 Road to A46 Road

Topography and geology

2.3.1 At the beginning of the section ground level is around the 9m contour, rising to the 17m contour at Roxton Farm. Between this point and Riby Road (A1173) ground levels are generally at and around the 17m contour, although they are lower in the floodplain of North Beck Drain (13m). South of Riby Road the ground levels drop onto the 15m contour where the route passes Riby Gap. West of Aylesby, the topography becomes gently undulating and rises onto the 22m contour. Between Barton Street (A18 road) and the end of the Section the ground level rises further onto the 48m contour where the pipeline route approaches the low foothills of the Lincolnshire Wolds west of Laceby.

2.3.2 The underlying superficial geology comprise mostly Glacial Till, however, Glaciofluvial Deposits of glacial origin are also present around Aylesby and between Irby Upon Humber and Laceby (sand and gravel with rare clay interbeds). Lacustrine Deposits are present around Irby Upon Humber which form small, localised pockets, commonly comprising laminated clay and silt and which may contain thin layers of organic material or sand. Alluvium is also present along localised watercourse channels, for example alongside North Beck Drain (south of Greenlands Farm) and between Irby Upon Humber and Laceby (tributaries of Laceby Beck). The solid geology is predominantly Chalk of the Burnham Chalk Formation, although chalk of the Welton Chalk Formation is present towards the southern end, generally comprising white, massive or thickly bedded chalk with common flint nodules, lacking tabular flint bands.

Prehistoric (to AD43) and Roman (AD42-450)

2.3.3 There is no evidence of significant prehistoric activity along this Section of the pipeline route, although prehistoric flintwork has been found during surface artefact collection but only in small quantities or as a single findspot [100, 101, 102, 690, 723]. In the wider area to the west of the pipeline route there is evidence of Neolithic and Bronze Age burial activity. Southwest of Riby Grove Farm are the remains of a Neolithic long barrow and a Bronze Age round barrow (NHLE1018838) that are located on a spur of land overlooking several dry valleys. And prehistoric flints were recovered in Aylesby during trial trenching (MNL4760).

2.3.4 Barton Street forms the parish boundary between several settlements and has been identified as a possible late Iron Age routeway that continued in use into historic times [104]. In the wider area, Oldfleet Drain (formerly Healing Beck) is a landscape feature of possible prehistoric to modern date (MNL897).

2.3.5 A possible Iron Age settlement is recorded at Aylesby [693] consisting of two probable roundhouses, gullies, and posts in alignments suggestive of the presence of buildings. This

site continued to be occupied into the Roman period, as evidenced by the remains of a large sub-rectangular 2nd century building.

~~2.3.5~~2.3.6 Geophysical survey for the Proposed Development identified linear and curvilinear anomalies representing possible settlements of prehistoric to Roman date near Immingham Grange ([REP1-043] Areas/fields 32-33 [743] and Area/Field 38 [744]). A possible enclosure east of The Lindens at Barton Street, Aylesby, may also be of late prehistoric date ([REP1-043] Area/Field 57b [745]).

~~2.3.6~~2.3.7 Evidence for further possible Roman settlement has been found southeast of Greenlands Farm, Stallingborough [105]. The site appears to occupy an area of higher ground and comprises a complex of small enclosures alongside a trackway. Pottery from the site included possible Iron Age and early medieval material suggesting the site may have earlier origins and was occupied into the post-Roman period. The discovery of fragments of Roman brick and tile in Stallingborough are possible indicators of Romano-British settlement or occupation [107, 108].

~~2.3.7~~2.3.8 There is also a scatter of findspots of other Roman material (pottery and metalwork) that indicate a Roman presence in the area [106, 109, 110, 111, 691]. It is possible that several of the undated cropmarks in this Section could date to the Roman period.

Early medieval (450-1066) and medieval (1066-1500)

~~2.3.8~~2.3.9 The pipeline route passes close to several historic settlements that have their origins in the early medieval and medieval periods. Aylesby is mentioned in Domesday (1086) and the Lindsey Survey (c.1202) and the village is probably a later Saxon foundation (occupation focused on Barton Street) [113]. Evidence of Anglo-Scandinavian occupation has been recorded (pottery and other finds) in the village which suggests occupation from at least the 10th century. Archaeological excavations recorded the foundations of two buildings [684] within Aylesby which may be of early medieval origins.

~~2.3.9~~2.3.10 Stallingborough is mentioned in Domesday, the Lindsey Survey (c.1115), the British Museum Charters (c.1130), the Episcopal Registers (1233) and the Valuation of Norwich (1254). Along with Healing, Immingham and a lost settlement called Lopingham, it forms a small cluster of settlements with place names indicating early Anglo-Saxon settlement [114]. The medieval village was originally located on the edge of the salt marsh that has since been almost totally reclaimed. A low hill formed an early settlement focus, and this elevated position was used for the church and the principal manor house of the village. Recorded as a designated ‘creek’ port during the post-medieval period, archaeological investigations (geophysical survey, monitoring, trial trenching and excavation) have found evidence for Late Saxon and medieval occupation.

~~2.3.10~~2.3.11 Irby upon Humber is mentioned in Domesday, the Lindsey Survey (c.1115) and the Assize Rolls (1202). The medieval settlement developed on patches of high ground around a river-less valley and formed around a sub-rectangular road with others radiating away from it with no particular focus for dense settlement [115].

~~2.3.11~~2.3.12 There is evidence of early medieval occupation at Riby. A substantial middle Saxon settlement comprising field and enclosure ditches and elements of probable post-built and sunken buildings have been investigated at Riby Crossroads (MLI52885), associated with an extensive pattern of cropmarks. At Riby Park (close to the Site Boundary) a small 7th century Anglo-Saxon cemetery was discovered in 1915 [697] and Anglo-Saxon pottery (MLI50023). Investigations southeast of Riby Church, within the Walled Garden have also recorded evidence of Roman, early medieval and medieval activity (MLI125879, MLI125880, MLI125881, MLI125882). Surviving earthworks associated with the shrunken

medieval settlement of Riby [696] suggest the presence of at least two distinct settlement nuclei.

~~2.3.12~~2.3.13 North of Barton House, Laceby another Anglo-Saxon inhumation cemetery was found during sand and gravel extraction in 1934 and 1936-1939 [687].

~~2.3.13~~2.3.14 Surface artefact collection north of Greenlands Farm, Immingham recovered a sherd of possible Saxo-Norman pottery [112].

~~2.3.14~~2.3.15 There are several smaller settlements with historic cores along this Section of the pipeline route. Roxton is mentioned in historic documents (Book of Fees, 1242 and in the 1334 tax list and it is marked on the Yarborough Estate map). Earthwork remains of the deserted medieval settlement have largely been levelled and ploughed, but house sites, trackways and toft boundaries appear as soil and crop marks covering a relatively large area [125] [APS_44] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. Document Reference: EN070008/APP/6.4.8.2)[APP-090]. At Stallingborough, part of the deserted medieval settlement, together with the earthworks of a post-medieval manor house and associated formal gardens, are located next to the parish church and are a scheduled monument [128]. At nearby Little London three areas which are separated by roads and earthworks are largely contiguous with the earthworks at Stallingborough. Features along the south bank of North Beck Drain may represent a series of moated enclosures and fishponds. Investigations have revealed building platforms, chalk foundations, tile and Roman, medieval to post-medieval pottery and a range of other material (animal bones, oyster shell, nails and a coin of Henry IV) [126].

~~2.3.15~~2.3.16 Aerial photography has recorded several areas of medieval/post-medieval ridge and furrow surrounding and extending from the historic villages and settlements, for example, at Stallingborough [124] [APS_43, APS41] and Aylesby [123] [APS_34]. Additionally, a detailed assessment of aerial photographs has also identified ridge and furrow as earthwork features crossing into the Site Boundary at Riby Gap [APS_40] and at The Lindens Farm (Riby Parish) [APS_38].

~~2.3.16~~2.3.17 Several medieval moated sites are recorded in this Section, including the scheduled Roxton Farm [119] and a probable moated site south of Manor Farm, Aylesby [117]. Church End Farm, Keelby contains a former manor house which was originally moated [135]. Aerial photography has also identified an undated possible moated site east of The Lindens (Riby Parish) which is outside of the Site Boundary, although an associated leat is within the Order Limits [APS_37].

~~2.3.17~~2.3.18 The pipeline route passes several designated churches and associated features that are of medieval and post-medieval date (for example, Church of St Peter and St Paul, Stallingborough [178], Church of St Bartholomew, Keelby [134], Church of St Lawrence, Aylesby [132], Church of St Edmund, Main Street, Riby [129] and the Church of St Margaret, High Street, Laceby [131]).

Post-medieval (1500-1900) and modern (post-1900)

~~2.3.18~~2.3.19 The HERs record that the pipeline route passes several gravel and chalk extraction pits [139] [APS_35] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)), [140, 141, 142, 689] and an extant windmill tower (The Mill) at Riby Road, Stallingborough [150]. Additionally, two small ponds or mineral extraction pits are depicted close to Beach Holt Lane, Aylesby on the OS 1st edition map (Lincolnshire Series XXI.SE, 1887). One of the features appears to be within the Site Boundary [653] but the other is south of the lane [654]. The same map also depicts another pond/extraction pit [656] in the fields to the north of Aylesby, which also appears to be within the Site Boundary. Also, an OS map of 1971 (TA 10 NE, 1:10k map) shows a possible

pond/extraction pit [671] within the same general area that appears to be on the edge of the Site Boundary (not visible on recent aerial images). An OS map of 1951 (Lincolnshire Series XXI.SE) shows a large possible extraction pit [658] that appears to be partly within the Site Boundary to the west of The Crofts, Laceby.

~~2.3.19~~2.3.20 A former guidepost [655] once stood at the original junction of Beach Holt Lane and Barton Street. A post-medieval field boundary which is partially within the Site Boundary is also visible as a cropmark on satellite imagery north of Wells Road (Riby Parish) [APS_39].

~~2.3.20~~2.3.21 The HERs also record numerous farmsteads and dwellings, both extant and demolished, located within the historic settlements or the surrounding farmland and which date to the post-medieval and modern periods) (for example, Roxton Farm, Immingham [167], Daisy Cottage, Stallingborough [179], Manor Farm, Aylesby [165], Church Farmhouse, Riby [154], The Crofts, Laceby [145], Rookery House, Laceby [180], The Cottage, Laceby [672] and Manor House, Keelby [158]).

~~2.3.21~~2.3.22 There are several post-medieval churches and religious buildings/structures within this Section of the pipeline route, including the Haagensen Memorial and Vault at Laceby Cemetery [156] and the Church of St Peter and St Paul, Church Lane, Stallingborough that was built at the end of the 18th century [178].

~~2.3.22~~2.3.23 The Tithe map of Riby (1839) depicts a former tract of woodland, Plings Moor Wood [657], close to the Site Boundary (not shown on OS maps). Rush Hills Covert [136] is a tract of woodland that is shown on OS maps of 1887-9 and is recorded in 1833 as 'Rash Hills Cover', and as Scrub Holt in 1828. Foxhole Wood [162] and Roxton Wood [163] are also marked on OS maps of 1887-9 and are recorded at least as far back as 1824. North Beck Drain [161] (see ES Volume IV Appendix 8-1: Historic Environment DBA, Annex E, Plate 8) [APP-089] is marked on OS maps of 1887-9. The tithe map also depicts a series of hedgerows that may be regarded as important under the historic criteria set out in the Hedgerow Regulations as forming part of a field system pre-dating the Enclosure [H7 – H19] (see ES Volume IV Appendix 8-1: Historic Environment DBA, Annex C) [APP-089], including several that are historic parish boundaries (for example, boundary between Stallingborough CP and Riby CP at Riby Gap, immediately south of Riby Road [631]. The boundary is marked by a hedgerow [H9] shown on the Stallingborough tithe map of 1844; boundary between Riby CP and Aylesby CP east of The Lindens [632]. The boundary is marked by a hedgerow [H14] shown on the Riby tithe map of 1839; boundary between Aylesby CP and Laceby CP northeast of Rush Hills Covert [633]. The boundary is marked by a hedgerow [H16] shown on the Aylesby tithe map of 1839; and boundary between Laceby CP and Irby upon Humber CP south of The Crofts [634]. The boundary is marked by a hedgerow [H19] shown on the Laceby tithe map of 1840).

~~2.3.23~~2.3.24 The non-designated Riby Park [177], which was built over the deserted medieval settlement of Riby, was laid out around the Church of St Edmund [129] which was re-built in the 19th century. The Park is recorded on both the OS 1st edition maps and 2nd edition maps (1902-6). Riby Park was historically associated with Riby Grove, a now demolished country house. An avenue of trees remains of the former carriage drive.

~~2.3.24~~2.3.25 The Manchester, Sheffield and Lincoln Railway – Cleethorpes to Barton railway line [138], which opened in 1848 (Cleethorpes extension added around 1863, part of a trans-Pennine route from Manchester via Sheffield), is crossed by the Site Boundary at the north end of the Section (south of the A180 road). A railway level crossing is marked along the line on OS maps of 1887-9 at Roxton [144]. Railway sidings at Immingham [143] are shown on the OS maps of 1887-9, located alongside Roxton Road, and an historic wooden railway signal box that is extant (Roxton Siding Signal Box) [166] (see ES Volume IV Appendix 8-1: Historic Environment DBA, Annex E, Plate 9) [APP-089].

~~2.3.25~~2.3.26 The pipeline route passes several historic roads of post-medieval date (marked on OS maps of 1887-9), although some are also likely to have medieval origins (for example, Riby Road, Stallingborough [174], Beach Holt Lane, Aylesby [170], Caistor Road, Laceby (road is part of a turnpike trust of 1765) [168], and North's Lane, Irby upon Humber [176].

~~2.3.26~~2.3.27 The HERs record modern refuse disposal sites in Aylesby [184] and Laceby [183], and three landfill sites in Aylesby [185, 186 and 187]. OS maps record several features, including a sheep wash at Stallingborough (marked on OS maps of 1906-8) [181] and a small park (Aylesby Park) [191] is also shown on OS maps of 1907-10 on the southwest side of Aylesby, around Manor House Farm.

~~2.3.27~~2.3.28 Several World War 2 military installations are located at the northern end of the Section (part of the defensive arrangements for Immingham Docks, including the Heavy Anti-Aircraft Battery H37 at Immingham Grange [188] (possibly never built), and a pair of designated World War 2 heavy anti-aircraft batteries at Stallingborough (grade II* listed) [189], which in 1946 became a Nucleus Force Battery headquarters). There is also a 1960s underground Royal Observer Corps monitoring post at Stallingborough (also designated [190]). In the wider area a group of closely spaced circular or sub-circular earthworks at Healing Wells Farm, identified on aerial photographs from the 1940s, possibly represent the site of a World War 2 searchlight battery (MNL4346).

Undated Assets

~~2.3.28~~2.3.29 There are several heritage assets that are undated which have been identified as cropmarks, or as a result of archaeological geophysical survey or archaeological assessment. It is possible that some of these could represent prehistoric to medieval or later occupation. Cropmarks 200 m southwest of Barton Street represent a small enclosure and field boundaries of possible medieval to post-medieval date [197]. Cropmarks 340 m southwest of Manor Farm, Aylesby, suggest the presence of an enclosure [683] possibly associated with Romano-British pottery found nearby. Also near Aylesby are further cropmarks and trackways [686] 140m south of Temple Lane suggesting the presence of an undated settlement site. Undated ditches, pits and a possible palaeochannel have been detected by archaeological geophysical survey at Immingham [195] and Stallingborough [194], and a substantial but undated ditch was recorded during archaeological trial trenching also at Stallingborough [196]. An undated cropmark south of Gatehouse Farm, Stallingborough [198] was not located during construction work for a linear pipeline scheme in 1996 (although a large deposit of organic sediment was recorded during archaeological investigations close to the site).

2.4 Section 3: A46 Road to Pear Tree Lane

Topography and geology

2.4.1 At the start of Section 3 the ground level is around the 50m contour, but it falls gradually to the 44m contour west of Scrub Holt Farm and then falls again onto the 28m contour as the pipeline route passes the earthwork remains of a scheduled Civil War earthwork fort (northeast of Walk Farm). Between the A18 road and Waithe Beck, west and south of Barnoldby Le Beck, the ground level varies between the 28m to 41m contour, but it drops down to the 18m contour where the pipeline route crosses the broad valley of Waithe Beck, south of Waltham Road, Brigsley (B1203 road). South of Ashby cum Fenby the ground level rises to the 40m contour as the pipeline approaches and follows the alignment of the A18 but as the route crosses Whites Road and the A16 Louth Road, south of North Thoresby, the ground levels fall to the 21m contour. Between the A16 and the end of the Section at Pear Tree Lane the ground level is between the 21m and 24m contour.

2.4.2 Superficial deposits of Glacial Till covers most of this section; however, alluvium is also present along localised watercourses, including Laceby Beck, Waithe Beck and more extensively around Old Fleet Drain on the south side of Grainsby. Lacustrine and Glaciofluvial Deposits are also present within this section and form smaller localised features (Glaciofluvial Deposits are recorded around Grainsby, and north of Ludborough there are Lacustrine Deposits). Chalk bedrock of the Burnham Chalk Formation underlies the northern end of the Section, although elsewhere it is Chalk of the Welton Chalk Formation (the Welton Formation follows the orientation of the A18 between Aylesby and Brigsley and generally comprises white, massive or thickly bedded chalk.

Prehistoric (to AD43) and Roman (AD42-450)

2.4.3 Evidence of prehistoric activity comes from findspots and cropmarks along this Section of the pipeline route. Small amounts of prehistoric flintwork comprising tools and waste material have been recovered at Irby Upon Humber [199], Ashby cum Fenby [201, 202, 724, 725, 726] and near Grainsby [208]. Neolithic flints (two flint scrapers and numerous flint flakes) plus a human tooth were discovered in Hatcliffe, located in discrete patches that possibly reflect disturbed features [206]. In the wider area prehistoric worked flints have also been discovered at Holton le Clay (MLI41238).

2.4.4 There is a possible prehistoric burial mound at Waltham that is visible as a subcircular cropmark on aerial photographs (MNL2554); and in the wider area there is a scheduled Bronze Age round barrow cemetery at Tetney (visible as low earthworks and cropmarks, below alluvial deposits) [NHLE1469975].

2.4.5 Topographic features such as hilltops and areas of higher ground may have been attractive to early settlers. A spring located on Welbeck Hill west of Barnoldby le Beck is marked on OS maps of 1887-9 but may have been used in the prehistoric period [203] (see ES Volume IV Appendix 8-1: Historic Environment DBA, Annex E, Plate 1) [APP-089]. Similarly, Laceby Beck may have been a valuable resource from the prehistoric period (connecting Wellbeck Spring in the south with the River Freshney in the north) [204] (see ES Volume IV Appendix 8-1: Historic Environment DBA, Annex E, Plate 11) [APP-089] and also Waithe Beck [205].

2.4.6 A possible late prehistoric or Roman enclosure with an opening to the east and a small enclosure at the northwest corner has been identified from aerial photographs at Ludborough [210]. Another possible late prehistoric farmstead with an associated field system has been identified from cropmarks (located to the west of North Thoresby) (MLI87920). Iron Age pottery from a ditch at Ashby cum Fenby is possibly indicative of late Iron Age activity [209].

2.4.7 There is evidence for more extensive Romano-British occupation and settlement. A possible Roman villa [211] is visible as a cropmark to the west of Barnoldby le Beck. Finds recovered from the site include a wide range of material such as brickwork, stone roof tile, a flint core and flakes, worked stone masonry, painted plaster, ceramic roof tile, possible tesserae, possible hypocaust tiles, animal bone, stonework with paint and a large number of grey-ware sherds. At Irby upon Humber a dark soil on the south side of Welbeck Hill has produced Roman finds (abundant animal bone, burnt material and Roman pottery) [219]. The presence of early medieval pottery at the same site suggests that occupation may have extended into later periods. Surface artefact collection, archaeological geophysical survey and archaeological excavations of a cropmark site has revealed evidence of a Romano-British settlement at Hatcliffe [220].

2.4.8 Southwest of Hatcliffe Mill another Roman settlement is suggested by possible building platforms, that are visible on aerial photographs alongside an old road [221], with abundant Roman pottery from an adjacent field. In Ashby cum Fenby a Romano-British pit or ditch

was uncovered during a watching brief in 1995 [212]. Roman material has also been found near Ashby Hill, west of Ashby cum Fenby [213], and Roman coins (together with early medieval and medieval material) have been reported by the Portable Antiquity Scheme near Ashby cum Fenby. An extensive Romano-British field system covering approximately 12 acres, that is associated with a possible vineyard, is visible on aerial photographs at North Thoresby [215]; and pottery that is associated with dark soilmarks at Grainsby may indicate the presence of kilns and a buried cultivation system [217]. The wider area also contains several findspots of Roman material, for example Roman pottery and tile has been found during investigations at Holton le Clay (MLI98910, MLI41242, MLI41243).

2.4.9 Cropmark features that have been detected in this Section, but which are undated, could represent evidence for occupation in the prehistoric and Roman periods (see below). Geophysical survey for the Proposed Development has identified linear and curvilinear anomalies representing possible settlements of unknown, likely prehistoric to Roman date near Ashby cum Fenby ([REP1-043] Areas/fields 102-103 [747] and Area/Field 109 [748]).

Early medieval (450-1066) and medieval (1066-1500)

2.4.10 The pipeline route passes several historic settlements that have their origins in the early medieval and medieval periods, however, not all settlements prospered, and there are a number of shrunken and deserted settlements (de-population caused by social and economic factors). Irby upon Humber (whose historic core lies just outside of the Site boundary) [115] is mentioned in Domesday, the Lindsey Survey (c.1115) and the Assize Rolls (1202) and likely has early medieval origins. It developed on patches of high ground around a river-less valley and the settlement formed around a sub-rectangular road with others radiating away from it, but it appears that there was no particular focus for dense settlement, instead it contained small clusters of houses and farmsteads, separated from each other by relatively small distances.

2.4.11 Barnoldby le Beck also has early medieval origins and is mentioned in historical sources (Domesday (1086), the Lindsey Survey (c.1115), and the Index to the Charters and Rolls (1202)) [228]. In the post-medieval period, it was de-populated and mparked. A cluster of farmsteads and cottages is shown around the parish church at the end of the 19th century, suggesting that in the medieval period there was a dense nucleated core with a tight grid like pattern of roads. Crofts arranged along a possible road, suggestive of planned settlement, are documented around 250m south of the church. Two large areas of parkland were established around the 18th to 19th centuries ‘Manor House’ and ‘Oakland House’ (also known as ‘Woodlands’ and ‘The Grange’) which may have involved some re-organisation of the settlement. Remains dating to the 13th and 14th centuries have been recorded during archaeological investigations and there are earthworks representing the former medieval extent of settlement to the south of Main Road and Waltham Road (building platforms, paddocks and trackways).

2.4.12 Brigsley is mentioned in Domesday (1086), the Lindsey Survey (c.1115), the Assize Rolls (1202) and the Index to Charters and Rolls in the British Museum (1202). The settlement is formed within a rough grid-based road system of three north-south roads and two east-west roads with the parish church roughly central [233]. Areas of historic settlement earthworks survive, including a hollow way to the east of the church which represents an abandoned road. To the east of the hollow way is a post-medieval manorial site, around which appear to be the earthworks of medieval building platforms and house plots now covered by woodland. Archaeological investigations in Brigsley have uncovered evidence of early medieval to medieval occupation (ditches containing Ipswich ware and Northern Maxey Ware) [234].

2.4.13 Ashby cum Fenby is also mentioned in Domesday (1086), the Lindsey Survey (c.1115) and the Curia Regis Rolls (1205). Archaeological investigations have found evidence of 9th to 15th century occupation [235, 227, 225 and 232]. Aerial photographs and historic documents suggest that the settlement comprised dwellings interspersed with garths, paddocks and crofts. From at least the 19th century the settlement spread to the south of the manor and church. The area around the medieval manor was converted into parkland and formal gardens during the post-medieval period.

2.4.14 Hawerby is an historic settlement known to have existed since the early medieval period [231]. The former settlement pattern is of house platforms and crofts arranged along a single central road, with the church and rectory to the west and a small country house with its associated farmstead to the north.

2.4.15 In the wider area the settlement of Holton le Clay, which is first documented in the Domesday Book, contains evidence of medieval settlement (visible on aerial photographs). Saxon graves have been found during excavations at the church, including finds dating from the mid- to late Saxon period and investigations elsewhere in the village have produced late Saxon and medieval pottery and medieval and post-medieval features (MLI80552).

2.4.16 The pipeline route passes close to an Anglo-Saxon cemetery on Welbeck Hill [223, 224] that spreads along a gravel spur projecting from the hilltop (located c.100m south of the edge of the Site Boundary). The site was discovered as a result of ploughing when the late Gordon Taylor, an amateur archaeologist, discovered a piece of femur bone, a fragment of Anglo-Saxon pottery and animal bone in areas of dark soil while field walking in 1962. The site was investigated by Mr Taylor in the following years (between 1962 and 1979) and a total of 72 inhumation and 5 cremation burials were recorded in three areas: north-south along the hill crest, east-west on the hill's western slope and a deposit of cremations on the eastern slope. Finds recovered from the burials indicate a likely date for the burials from the mid-5th century to the 6th century and it is likely that the cemetery went out of use in the late 6th or early 7th centuries. It is possible that the cemetery has not been fully excavated.

2.4.17 It has also been claimed that occupation on Welbeck Hill began in the Bronze Age with a possible Roman signal station nearby.

2.4.18 Welbeck Hill Anglo-Saxon cemetery lies relatively close to other known Anglo-Saxon cemeteries, including one c. 2.8km to the north at Laceby [687] and another c. 4.7km, northwest, at Riby Park [697].

2.4.19 There is evidence of medieval settlement and cultivation across this Section with a cluster at and around the settlements that had their origins in the early medieval period. Southwest of North Thoresby, traces of the deserted medieval settlement of Autby [239] have been identified in the northwest corner of Autby Park [361], including the cropmarked remains of ridge and furrow cultivation that are within and next to the Site Boundary [APS_22] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)). The scheduled remains of the deserted medieval village of Beesby [240] is located outside of the Site Boundary. North of Cadeby Hall (northwest of Ludborough) and south of Cadeby Hall are the remains of the deserted medieval village of North Cadeby [241]. An early medieval coin [699] is recorded at Irby upon Humber.

2.4.20 Waithe deserted medieval village is located alongside the A16 road (MLI41233), and the shrunken medieval settlement of Grainsby extends either side of Grainsby Lane (MLI41222).

2.4.21 There are several medieval moated sites in this Section, including east of Manor House, Irby upon Humber [254], where a square enclosure is flanked and respected by ridge and furrow. Although potentially a decorative post-medieval moat, a second moated site at Irby

upon Humber may prove to be medieval. There is a moated site and other possibly associated features at Hall Farm [255], Ashby cum Fenby. At Barnoldby le Beck an L-shaped fishpond, which is marked on OS maps of 1887-9, is likely to be the remains of another moated site [249]; and at Ludborough, the Manor Moated site [673] has several earthworks including a rectangular enclosure likely to represent the site of the former manor house.

2.4.22 Aerial photography has identified several areas of medieval/post-medieval ridge and furrow throughout this Section. At Barnoldby le Beck extensive ridge and furrow earthworks almost surround the village core and were preserved in the two landscape parks to the south of the village [251] [APS_30] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)). A detailed assessment of aerial photographs has also identified an area of ridge and furrow that is partially within and next to the Site Boundary north of Barnoldby le Beck Park, visible as cropmarked features [APS_31]. Ridge and furrow is also visible at Welbeck Hill, northwest of Barnoldby le Beck [248] [APS_32]. At Brigsley, numerous disparate areas of ridge and furrow earthworks [252] suggest that these remains are part of more extensive cultivation systems (a geophysical survey identified linear features which might be the remains of ridge and furrow along with other field boundaries). In and around Ashby cum Fenby there are also extensive earthwork remains of ridge and furrow cultivation features visible on aerial photographs from the late 1940s [250] [APS_24, APS_25, APS_27, APS_28, APS_30]. Ridge and furrow cultivation features are also recorded at Laceby [253], Hatcliffe [247], Grainsby Grange [244, 245] [APS_23], Hawerby [246] and northeast of Ludborough [242] and at Cold Harbour Farm (Ludborough Parish) where cropmarked features are visible partially within and next to the Site Boundary [APS_18].

2.4.23 The pipeline route passes several designated parish churches and associated features that are of medieval date (many located within the historic settlement core areas: Church of St Andrew, Irby upon Humber [257] and Church of St Helen, Church Lane, Barnoldby Le Beck [266], Church of St Andrew, Beelsby [268], Church of St Helen, Brigsley [259], Church of St Peter, Ashby cum Fenby [261], Church of St Nicholas, Grainsby [262], Church of St Margaret, Barton Street, Hawerby cum Beesby [258], Church of St Helen, North Thoresby [264] and Church of St Mary, Main Street, Ludborough [265].

Post-medieval (1500-1900) and modern (post-1900)

2.4.24 Southeast of Irby upon Humber and below Welbeck Hill is a scheduled Civil War earthwork fort [303] [APS_33] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)). The 17th century fort comprises a rectangular earthen rampart with projecting bastions at each of its four corners, an enclosing ditch, and a counterscarp bank. It is situated on high ground close to the road from the Humber to Boston and Kings Lynn (Barton Street, A18), and within easy reach of the road from Newark to the Humber via Gainsborough (Grimsby Road, A46).

2.4.25 The HERs record several areas of extant historic woodland south of Ashby cum Fenby, including Fenby Wood (east) [276] and Fenby Wood (west) [319] (recorded as Cottager's Plat in 1824, and Cottager's Plot in 1843) which are located next to the Site Boundary; and in the same area Old Brat's Plantation [320] and The Holt [321], woodland tracts that are marked on OS maps of 1887-9.

2.4.26 A post-medieval field boundary that is partially within the Site Boundary is visible on satellite imagery between Barnoldby le Beck Park and Waithe Beck [APS_29] and another field boundary that is broadly aligned along the axis of the Site Boundary is visible also as a cropmark feature at Ashby cum Fenby [APS_26].

2.4.27 The OS maps of 1887-9 show two areas of parkland on the south side of Barnoldby le Beck with a northern boundary along Main Road and Waltham Road [282, 283] (see ES Volume IV Appendix 8-1: Historic Environment DBA, Annex E, Plate 2 and Plate 3) [APP-089]. There are also two areas of parkland at Hawerby cum Beesby, including Hawerby Park [322], which surrounds St Margaret's Church (shown on OS maps of 1887-9), and to the south a large area of dispersed trees, occasionally in groups, indicative of a landscaped park and shown on the OS maps of 1887-9 [323] (possibly an extension of Cadeby Park which is annotated to the south, or parkland for Beesby House which lies at the centre of the landscape). The parkland is still extant in areas where scheduled medieval earthworks are extant [240]). Early 20th century OS maps (between 1906-10) also depict an area of parkland at Oaklands, Laceby [410] and southwest of North Thoresby, Autby Park is marked on OS maps of 1956 [361].

2.4.28 Other miscellaneous features that are marked on OS maps include a sheepwash at Barnoldby le Beck [284], a post-medieval mill race at Hatcliffe [288], a sluice [272], a blacksmiths workshop [273] and an unidentified site ('Far Yard') [274] at Ashby cum Fenby. On Brigsley Road there is also a milepost [299], one of a set that were erected along the turnpike road from Grimsby to Wold Newton, and a designated post-medieval well [356] which may have earlier medieval origins (located next to Hall Farmhouse in Ashby cum Fenby). The 1st edition OS maps (Lincolnshire Series XXX.SE, 1887) shows a possible pump [659] on the south side of Thoroughfare Lane (south of Ashby cum Fenby) that appears to be within the Site Boundary (feature later depicted as a well).

2.4.29 A gasometer [360] is marked at Oaklands, in Laceby, possibly part of a private gasworks. At Ludborough the 1st edition OS map (Lincolnshire Series XL.SW, 1888) shows the East Lincolnshire Railway line [661] which was opened in 1848 but was closed to passenger traffic in 1961.

2.4.30 The pipeline route passes several gravel and chalk extraction pits that are marked on OS maps from the end of the 19th century (Irby upon Humber [289, 290, 702], Barnoldby le Beck [281], Beelsby [286], Hatcliffe [287, 324] and Ashby cum Fenby [271]). A pond/extraction pit [660], that is not recorded on the HER, is shown on the 1st edition OS maps (Lincolnshire Series, 1887) located c.115m south of the demolished Fenby Farm [315]. It is also depicted on the Tithe map of Ashby cum Fenby (1840).

2.4.31 A demolished hall and a park at Grainsby, which covered an extensive area, are marked on the OS 1st edition maps [362]. Grainsby Hall was used by the army in World War 2 but after 1945 was empty and eventually demolished in 1973. Possible post-medieval wood banks were identified as cropmarks in the park [304].

2.4.32 Several demolished post-medieval buildings and structures are located within this Section (mostly within and surrounding the historic settlements), including dwellings/houses at Barnoldby le Beck [302, 279], Brigsley [269], Ashby cum Fenby [292, 275] and Hawerby [318]; and former farms/farmsteads are recorded on the HERs at Barnoldby le Beck [285], Brigsley [332], Ashby cum Fenby [301, 315, 317], Beesby [316] and at Ludborough [368].

2.4.33 The pipeline route passes numerous extant farms, farmsteads, farm buildings, cottages, homesteads/dwellings and related features that date to the post-medieval and modern periods within this Section (for example, in Laceby, Scrub Holt [329]; at Irby upon Humber, Walk Farm [330]; at Barnoldby le Beck, New Farm [280]; at Brigsley, Manor House Farm [291]; at Ashby cum Fenby, Moorhouse Farm [277]; at East Ravendale, The Thatched Cottages [381]; at Grainsby, Grainsby Grange [387]; at Hawerby, Pear Tree Cottage [382]; at North Thoresby, Walnut Cottage and adjacent cottage [310]; at Beesby, Hawerby Hall [373]; at Cadeby, Cadeby Hall [314]; at Fulstow, Bonscaupe [365]; and at Ludborough, Cold Harbour [367]).

2.4.34 The Section also contains several extant and demolished chapels of post-medieval and modern date, at Irby upon Humber (Hog Pit Hill) [399]; at Brigsley, a Wesleyan Methodist Chapel [325] and also a Primitive Methodist Chapel on Waithe Lane [328].

2.4.35 There are also several historic roads of post-medieval date (marked on OS maps of 1887-9), although some are likely to have medieval origins (for example, Walk Lane, Irby upon Humber [348]; Main Road, Barnoldby le Beck [341]; Main Road, Beelsby [349]; Waltham Road, Brigsley [338]; Low Road, Hatcliffe [350]; Brigsley Road, Ashby cum Fenby [342]; Beesby Road [352]; Wold Newton [353]; and Hawerby Road [354].

2.4.36 The pipeline route crosses a number of historic civil parish boundaries, including boundary between Irby upon Humber CP and Barnoldby le Beck CP, east of Welbeck Spring (boundary formed by Laceby Beck) [204]; boundary between Barnoldby le Beck CP and Ashby cum Fenby CP at Waithe Beck (west of Brigsley) [205]; boundary between Ashby cum Fenby CP and Grainsby CP (marked as a field boundary on the OS maps) [635]; boundary between Grainsby CP and North Thoresby CP south of Grainsby Grange (marked as a field boundary on the OS maps) [636]; boundary between North Thoresby CP and Ludborough CP south of the former Autby House and Autby Park (marked as a field boundary on the OS maps) [637]; and boundary between Ludborough CP and Utterby CP is crossed at Pear Tree Lane [638].

2.4.37 Several hedgerows marked on tithe maps may be regarded as important under the historic criteria set out in the Hedgerow Regulations as forming part of a field system pre-dating the Enclosure Acts [H20 – H30].

2.4.38 There is a World War 2 searchlight battery and possible command post at Ashby cum Fenby visible on aerial photographs [400].

2.4.39 At Irby Upon Humber there is a grade II listed World War 1 war memorial [414] at the Church of St Andrew, Church Lane.

2.4.40 This Section of the pipeline route also passes various other features that are of modern date, including several landfill sites at Irby upon Humber [393, 698] and at Beelsby [394].

Undated Assets

2.4.41 The Section contains several undated cropmark features (enclosures and linear features) which could belong to any period (prehistoric to modern), including at Irby upon Humber (faint cropmarks indicating a possible sub-rectangular enclosure and trackway, [416]).

2.4.42 Undated, possible prehistoric enclosures have been identified in Ludborough Parish within the Site Boundary (west of the A16 road) [APS_21], at Damwells Farm [APS_20], at Cold Harbour Farm [APS_19] and south of Station Road [675] [APS_17] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)).

2.5 Section 4: Pear Tree Lane to Manby Middlegate (B1200)

Topography and geology

2.5.1 Between Pear Tree Lane and Louth Road the ground level is gently undulating at between the 24m to 17m contour, although lower where the route crosses the floodplain of Poulton Drain and its tributaries, west of Covenham St Mary (10m) and Yarburgh Beck/Black Dike (12m), southwest of Yarburgh. From Alvingham Road the ground level drops to the 9m contour where the route crosses the Louth Canal/Navigation and River Ludd, between Alvingham and North Cockerington. Between North Cockerington and South Cockerington the ground rises slightly onto the 13m contour, before dropping again onto the 7m contour to the east of South Cockerington, and between here and the end of the section at Manby

Middlegate (B1200 road) the topography is low lying and relatively flat at between the 7m and 4m contour.

2.5.2 The superficial geology in this Section mostly comprises Glacial Till. Alluvium is also present along localised watercourses, including Poulton Drain catchment area (western side of Covenham St Mary), Yarburgh Beck/Black Dike and its tributaries (south of Yarburgh) and more extensively around Louth Canal and the River Ludd, to the south of Alvingham. East of South Cockerington the pipeline route crosses Pock Hill Lane and runs along the interface of an area that comprises Glacial Till and Tidal Flats Deposits. The bedrock geology in this Section comprises Chalk of the Welton Chalk Formation, although the pipeline route crosses into the Ferriby Chalk Formation to the east of Brackenborough.

Prehistoric (to AD43) and Roman (AD42-450)

2.5.3 The Site Boundary in this Section cross the edge of the low-lying Mablethorpe Outmarsh in an area where there are few known heritage assets of prehistoric or Roman date. Probable Bronze Age barrows have been identified as cropmarks at Alvingham [530] and at Keddington [706]. Possible enclosures have also been identified at Keddington [707, 708]. The walkover survey identified three isolated lithic fragments of likely prehistoric date near Covenham [727, 728, 729]. In the wider area prehistoric flintwork has been found at South Cockerington (MLI81617, MLI43242). A probable ring ditch was detected during an archaeological geophysical survey at South Cockerington (MLI116056), and a possible Bronze Age barrow has been identified on aerial photographs south of Covenham St Mary (MLI87809), but these assets are situated outside the Site Boundary.

2.5.4 A possible Iron Age ‘banjo’ enclosure is visible as a cropmark feature partially within the Site Boundary to the south of Louth Canal (Keddington Parish) [APS_12] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)).

2.5.5 Find spots and features of Roman date are absent from this Section of the pipeline route.

Early medieval (450-1066) and medieval (1066-1500)

2.5.6 The historic settlements of Covenham St Bartholomew, Covenham St Mary, Yarburgh, North End, Alvingham, North Cockerington, South Cockerington, Keddington and Grimoldby were likely founded in the early medieval or medieval periods, and all are documented since the medieval period. The settlements are often associated with ridge and furrow and other settlement related features (crofts, tofts and former field boundaries and lanes), which extend beyond their historic core areas, and which are visible on aerial photographs (Covenham St Bartholomew (MLI87811), Covenham St Mary (MLI87807, MLI87808) and Yarburgh (MLI87851)).

2.5.7 The scheduled earthwork and buried remains of the deserted medieval village of Brackenborough are located c.1 km west of the Site Boundary [437].

2.5.8 The historic settlement at North Cockerington [420] is first documented in Domesday. Medieval settlement remains (trackway, ponds, enclosures, ridge and furrow, field boundary, boundary bank and crofts) are visible as cropmarks and earthworks around the present village. Archaeological watching briefs have recorded evidence of medieval and later occupation which are likely associated with the earthworks and cropmarks. Features associated with the settlement were visible from the detailed assessment of aerial photographs, but the remains lie to the north of Red Leas Lane and outside of the Site Boundary [APS_10].

2.5.9 Between Meadow Lane and Red Leas Lane, on the south side of North Cockerington, there is a scheduled medieval moated site (rectangular enclosure surrounded by a ditch) [421].

2.5.10 South Cockerington (MLI43243) [422] is first documented in Domesday and it probably has its origins in the Anglo-Saxon period. The regular road layout is possibly the result of deliberate planning. Earthworks associated with medieval settlement (crofts and trackways) have been identified and archaeological watching briefs have recorded evidence of medieval occupation.

2.5.11 Keddington is also first recorded in the Domesday book and is listed as being owned by the Bishop of Durham and Rainer of Brimeux. Based on the size of the settlement and the etymology of the name it is likely that the settlement originated in the early Anglo-Saxon period. A medieval earthwork moat, enclosures and ditches are recorded near the village [709], as are earthworks of ridge and furrow visible on aerial photographs [713] [APS_12].

2.5.12 In the wider area, extensive earthworks have been noted in and around the village of Alvingham (MLI41254) (tofts, crofts and strip fields), spreading out from the present village core. Other features include enclosures, linear features, a boundary, a boundary bank and a pond.

2.5.13 Several areas of medieval/post-medieval ridge and furrow have been identified within and surrounding the historic settlements, at Alvingham (MLI5866, MLI116055) [422], North Cockerington [423, 424, 425, 429] [APS_9] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)), South Cockerington [426, 427, 428] [APS_8], Keddington [435] and Grimoldby [436]. The cropmarked remains of ridge and furrow are also visible on satellite imagery within the Site Boundary at Grove Farm (Utterby Parish) [APS_16] and at Grange Farm (Brackenborough with Little Grimsby Parish) [APS_15].

2.5.14 A possible medieval water channel [433] is visible on aerial photographs between the River Lud and the Louth Canal, north of Keddington Corner Farm, East Keddington and there is a former medieval/post-medieval windmill mound alongside Marsh Lane, South Cockerington [440].

2.5.15 There are a sparse number of find spots of medieval date, including a medieval cauldron or skillet found at North Cockerington [434].

2.5.16 The pipeline route passes several designated abbeys, parish churches and associated features which were constructed in the medieval period (many within historic settlement cores, including: Church of St Andrew, Utterby [441], Church of St Bartholomew, Village Street, Covenham St Bartholomew [447], Church of St Mary, Covenham St Mary [445], Chuch of St John the Baptist, Yarburgh [443], Church of St Mary, Fotherby [439], Church of St Adelwold, Abbey Lane, Alvingham [448], Church of St Mary, Abbey Lane, Alvingham [449], Church of St Edith, Main Street, Brackenborough with Little Grimsby [438], Church of St Margaret, Keddington [452], Church of St Leonard, South Cockerington [535], Louth Abbey [430], Church of St Edith, Tinkle Street, Grimoldby [450] and Church of St Peter, Saltfleetby St Peter [454].

Post-medieval (1500-1900) and modern (post-1900)

2.5.17 The 1st edition OS maps (Lincolnshire Series XL.SW, 1888) depict a possible pond/extraction pit [662] northeast of Pear Tree Farm and within the Site Boundary. In the same general area, the Tithe map of Utterby (1839) also depicts a possible tract of former heathland fen (identified as ‘furze’) together with several rectangular features (possibly ponds/buildings and a north-south aligned trackway along the western side) [663]. In the fields between Utterby and Yarburgh the same tithe map also depicts a demolished homestead (house and garden, stackyard and buildings) [665] to the south of Utterby Beck and c.50 m west of the Site Boundary.

2.5.18 A post-medieval field boundary that is partially within the Site Boundary is visible on satellite imagery next to Brackenborough Road (parishes of Alvingham, Keddington and Brackenborough with Little Grimsby) [APS_14] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)).

2.5.19 The pipeline route crosses the historic Louth Navigation [525] between Alvingham and North Cockerington. Construction of the canal began in 1767 and linked inland Louth with coastal Tetney. A small inland port developed at Louth and the canal remained open until the 20th century (canal closed to navigation in 1924). This Section contains several designated (listed grade II) historic canal locks of red brick and ashlar limestone construction, including Ticklepenny Lock TF 351889 [455] and Willows Lock TF 352892 [456] at Keddington; Alvingham lock and inverted syphon [471] and Salter Fen lock at Alvingham [472]. At Abbey Lane, Alvingham, there is a designated 18th century watermill [515] alongside Alvingham Mill Stream, presumably diverted from the River Lud/Louth Navigation.

2.5.20 There are a number of existing post-medieval Methodist chapels, including South End Primitive Methodist Chapel, North Cockerington [483] and the United Methodist Free Chapel, South Cockerington [484].

2.5.21 There are several demolished farms/farmsteads of post-medieval to modern date at Brackenborough [508], North Cockerington [497], South Cockerington [492, 493 494] and at Grimoldby [512, 513, 503].

2.5.22 The pipeline route also passes numerous extant farmsteads, farm buildings, cottages, dwellings and related features of post-medieval to modern date (many identified as a result of the Lincolnshire Farmstead Mapping Project), including at Utterby Pear Tree Farm (Pear Tree Lane Barn) [487]; at Covenham St Bartholomew, Mill House [521]; at Covenham St Mary, (Gowt Farm) [489]; at Yarburgh, Westfield House [480]; at Fotherby, Allenby Almshouses [465]; at Little Grimsby, Little Grimsby Grange [504]; at Alvingham, Grange Farmhouse [481]; at Brackenborough, Little Grimsby Hall [464]; at North Cockerington, The Old Farmhouse [477]; at Keddington, Abbey Farmhouse [519]; at South Cockerington, The Almshouses [462]; at Grimoldby, Eastfield Farmhouse [474]; and at Saltfleetby St Peter, Tumbleydown Cottage [524]).

2.5.23 At the junction of Louth Road, Red Leas Lane, School Lane and Mill Hill Way on the south side of North Cockerington the OS 1st edition maps (Lincolnshire Series XLVIII.SE, 1888) depicts and labels three buildings of possible late 19th century date that are close to the Site Boundary and that are still extant: White Hart Inn and post office [666], a smithy [667] and an un-named homestead/dwelling [668]. The 1907 OS map labels a post office at the same location next to the inn (probably part of the same building as the inn).

2.5.24 A field opposite White Hart Inn is recorded on the Tithe map of North Cockerington (1844) as ‘Brickkiln Close’ [669] suggesting a possible link to local rural industrial activity. The pipeline route passes a large post-medieval mill mound [453] at North Cockerington that is next to an area of ridge and furrow. (The mound was originally identified as a burial mound (tumulus) on early OS maps).

2.5.25 The pipeline route crosses historic civil parish boundaries in this Section, including the boundary between Utterby CP and Brackenborough with Little Grimsby CP at Ings Lane [639]; boundary between Brackenborough with Little Grimsby CP and Alvingham CP [640]; boundary between Alvingham CP and North Cockerington CP at the River Lud [641]; boundary between North Cockerington CP and South Cockerington at Louth Road [642]; boundary between South Cockerington and Grimoldby CP at Grayfleet Drain [643]; and boundary between Grimoldby CP and Manby CP at Manby Middlegate (the B1200 road) [644].

2.5.26 Several hedgerows marked on tithe maps may be regarded as important under the historic criteria set out in the Hedgerow Regulations as forming part of a field system pre-dating the Enclosure Acts [H31 – H34].

2.5.27 The pipeline crosses a demolished railway line of post-medieval to modern date (Great North Railway, Mablethorpe Branch line, marked on OS maps from 1888: Lincolnshire Sheet XLVIII.SE) northeast of Eastfield Farm, Grimoldby, which is visible as a field boundary/trackway/soilmark (Google Earth images) (part of the same line is also visible at Theddlethorpe All Saints) [608]. This Section contains two World War 2 anti-aircraft obstructions at Grimoldby which are part of a larger network of similar features constructed to deter an invading landing force [526, 527]. At Covenham St Bartholomew and Grimoldby there are war memorials dedicated to the fallen of World War 1 and World War 2 which are designated heritage assets (listed grade II): Covenham St Bartholomew War Memorial [529] and Grimoldby War Memorial [528].

Undated Assets

2.5.28 There are several undated enclosures visible as cropmarks on aerial photographs which have been found at North Cockerington (possible moated site) [531] and near South Cockerington [532, 534]. Undated linear cropmarks are also visible at Grimoldby [533]. An undated (possible prehistoric) rectilinear enclosure is visible on aerial photographs and lies partially within the Site Boundary, north of Louth Canal (Alvingham Parish) [APS_13] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)).

2.6 Section 5: Manby Middlegate (B1200) to Theddlethorpe and Mean Low Water Springs

Topography and geology

2.6.1 Ground levels throughout Section 5 are generally flat and around the 3m to 4m contour as the pipeline route crosses the coastal fenland area.

2.6.2 The superficial geology covering most of this Section comprise Tidal Flat Deposits but includes, at the northern end, small areas of Glacial Till immediately south of Manby Middlegate road (B1200). The northern end of this Section is underlain by Chalk of the Welton Chalk Formation and then Chalk of the Burnham Formation from east of Walk Farm, Great Carlton to the end of the Section.

Prehistoric (to AD43) and Roman (AD42-450)

2.6.3 This Section of the pipeline route is located on the low-lying Mablethorpe Outmarsh area where there are few known heritage assets of prehistoric or Roman date. A prehistoric flint scraper [536] was found between Two Mile Bank and Pyewipe Farm during archaeological monitoring for the Maltby le Marsh to Manby Replacement Water Main.

2.6.4 Archaeological watching brief near Walk Farm, Great Carlton recorded evidence of a Romano-British field system and occupation remains [537] [APS_02] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)) suggesting the possible presence of a nearby settlement (ditches, gully, hearth, pit, pottery and possible industrial activity). A sherd of Roman pottery was found during archaeological monitoring at Gayton le Marsh [538].

Early medieval (450-1066) and medieval (1066-1500)

2.6.5 There is extensive evidence for medieval settlement and cultivation within this Section of the pipeline route. Northeast of Great Carlton the route passes the remains of a medieval field system and settlement at Walk Farm [548] [APS_02]. Here the remains sit on slightly higher ground above the neighbouring enclosed fen that forms the marshland parish (features visible on aerial photographs include crofts, tofts, building platforms, a moat, ridge and furrow and a linear boundary feature). An archaeological geophysical survey (2003) identified a series of archaeological anomalies, including linear and rectilinear features (possibly representing field systems and/ enclosures) and several pit-like features (represented by burning or possible domestic dumping). During a subsequent archaeological watching brief (Maltby le Marsh to Manby Replacement Water Main) ridge and furrow was recorded and a sherd of medieval pottery. Next to the medieval settlement a boundary earthwork is also visible on aerial photographs [556]. Within the wider area there is also an undated earthwork north of Walk Farm that could be part of the settlement (MLI88283).

2.6.6 An area of historic settlement is documented at Theddlethorpe All Saints [539] which is mentioned in Domesday (although there is no distinction between Theddlethorpe All Saints and Theddlethorpe St Helens) and remains of the settlement have been identified on aerial photographs (enclosures and a moat). Pottery from Theddlethorpe All Saints suggests possible early medieval/medieval occupation west of Mablethorpe Road [540] and near to Railway Farm [541]. A possible late Saxon/medieval farmstead has also been recorded next to Station Road [542]. A medieval moated site known as 'Keleshall' was found in 1956 along Grove Road [547]. Between Slates Farm and Will Row on the western side of Theddlethorpe All Saints more remains of likely medieval settlement have been found (cropmark and earthwork remains of tofts and a trackway visible on aerial photographs next to the Great Eau) [543]. Also, north of Will Row and alongside the Great Eau there are more cropmarks and earthwork features (including the remains of tofts) [544] [APS_06] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)).

2.6.7 At Theddlethorpe St Helen there is evidence of medieval settlement and cultivation (tofts and ridge and furrow) either side of Mablethorpe Road (A1031 road), extending as far south as Carlton House [545] [APS_05]; and also next to Dicote House (cropmark and earthwork remains of enclosures and tofts) [546].

2.6.8 Areas of medieval/post-medieval ridge and furrow have been identified associated with the evidence of settlement activity, including at Pyewipe Farm, Gayton [550] and either side of Station Road [617] [APS_06]. In the wider area, cultivation earthworks are also recorded at Theddlethorpe All Saints, alongside Highgate and east of Highgate Farm, (MLI88216). Extensive areas of ridge and furrow are also present at Theddlethorpe St Helen [562] / [732] and either side of Mablethorpe Road~~,~~ [549 [APS_06], 551, 552, 554, 555]. West of Mablethorpe Road there are other linear and pit-like features (recorded during archaeological monitoring) that are undated, but which could belong to this period [614, 615, 616].

2.6.9 Medieval pottery has been found at Gayton le Marsh during surface artefact collection for a linear scheme [557], and a medieval candlestick was found during drainage work on the edge of Long Eau at Dowsey Fen [558] and these could be related to the medieval settlement near Walk Farm. Several pieces of medieval pottery were also recovered during an archaeological watching brief close to the former Theddlethorpe Gas Terminal [559].

2.6.10 A probable medieval salters' route [561] follows the parish boundaries between Gayton le Marsh and Great Carlton that corresponds to an earthwork that is recorded (as Two Mile Bank) on the 1st edition OS map of 1888.

2.6.11 The pipeline route passes several designated parish churches (listed grade I and grade II*) and associated features which date to the medieval and post-medieval periods (for example, Church of All Saints, Louth Road, Theddlethorpe All Saints [565] and the 14th century Church of St Helen, Main Road, Theddlethorpe St Helen [564].

Post-medieval (1500-1900) and modern (post-1900)

2.6.12 A post-medieval field boundary that is partially within the Site Boundary is visible on satellite imagery north of Walk Farm (Great Carlton Parish) [APS_04].

2.6.13 This Section of the pipeline route contains several demolished farms/farmsteads of post-medieval to modern date, including at Saltfleetby [584, 585, 586], Manby [598], Gayton le Marsh [602] and at Mablethorpe and Sutton [599].

2.6.14 The pipeline route passes a post-medieval pumping station [568] and numerous extant farms, farmsteads, farm buildings, homesteads/dwellings and related features that are of post-medieval to modern date (many identified as a result of the Lincolnshire Farmstead Mapping Project) (for example, at Saltfleetby St Peter, Poplar Farm [583]; at Manby, Pear Trees Cottage [570]; at Great Carlton, Lordship Farm [596]; at Gayton le Marsh, Gayton le Marsh Grange [576]; at Theddlethorpe All Saints, Hall Farmhouse [571]; at Theddlethorpe St Helen, Ashleigh Farm [580]; and at Mablethorpe and Sutton, Sand Hills Farm [600]).

2.6.15 The pipeline route crosses several historic civil parish boundaries, including the boundary between Manby CP and Saltfleetby CP at Green Lane, southwest of Saltfleetby (marked by a field boundary) [645]; the boundary between Saltfleetby CP and Great Carlton CP (Long Eau watercourse, north of Walk Farm) [646]; the boundary between Great Carlton CP and Gayton le Marsh CP at Two Mile Bank (east of Walk Farm) [561]; the boundary between Gayton le Marsh CP and Theddlethorpe All Saints CP (Great Eau/Old Engine Drain) [647]; the boundary between Theddlethorpe All Saints CP and Theddlethorpe St Helen CP (Mill Road) [648]; and the boundary between Theddlethorpe St Helen CP and Mablethorpe and Sutton CP (Crook Bank, east of former Theddlethorpe Gas Terminal) [649].

2.6.16 Several hedgerows marked on tithe maps may be regarded as important under the historic criteria, set out in the Hedgerow Regulations as forming part of a field system pre-dating the Enclosure Acts and shown on Great Carlton parish tithe map [H35] (‘Willow Row Bank’) and in Gayton le Marsh parish (1839 tithe map) [H36 – H38].

2.6.17 The pipeline crosses a demolished railway line of post-medieval to modern date at Theddlethorpe All Saints, the Great North Railway, Mablethorpe Branch line [608] (marked on OS maps from 1888: Lincolnshire Sheet XLIX.SE & XLIXA.SW), which is visible as a soilmark.

2.6.18 Military defence sites have been constructed along the coastline since at least pre-Viking times (Old Skegness which has been lost to the sea may have been a Roman walled site and part of the Saxon Shore Fort system and placenames suggest that look-out places were sited along the coast in the Anglo-Saxon period). Medieval defensive earthworks and post-medieval coastal beacons were added in subsequent periods. From at least the mid-19th century defences were upgraded as a result of the threat of French invasion and during World War 2 these were significantly improved.

2.6.19 Although much of this military infrastructure was removed/decommissioned in the subsequent post-war years, elements are recorded on the local authority HERs and are still visible within the landscape. There are several World War 2 aircraft obstruction sites which are visible on aerial photographs, including at Theddlethorpe All Saints [612] and at Theddlethorpe St Helen [613]. Assessment of aerial photographs has also identified other sites in the same area, including between Two Mile Bank and the Great Eau (Gayton le

Marsh Parish) [APS_01] (ES Volume IV – Appendix 8-2: Aerial Review and LiDAR. (Document Reference: EN070008/APP/6.4.8.2)) where the features lie partially within the Site Boundary; and at Mablethorpe [APS_03] where the features are beneath a holiday camp. Undated buildings, which are possibly part of World War 2 defensive structures, were also identified on the beach northeast of Theddlethorpe Gas Terminal [APS_07]. These are part of a larger group of former coastal defence installations in the wider area (pillbox and gun emplacements (MLI43272); anti-aircraft pillbox (MLI125949, MLI125950); aircraft obstructions (MLI88212); and the possible site of a World War 2 store (MLI43393)).

Undated Assets

2.6.20 The pipeline route passes other features which are also visible on aerial photographs, but which remain undated. These include linear features at Theddlethorpe All Saints, on the eastern side of the Great Eau [619] and close to the centre of the village [621]; and two enclosures at Theddlethorpe St Helen [622, 626].

2.7 Archaeological Research Agenda (ARA)

2.7.1 This section outlines the proposed Archaeological Research Agenda (ARA) which underpins the mitigation programme and the methodologies to be deployed for the Proposed Development. The Proposed Development presents a valuable opportunity to examine a transect through the landscape of northern and eastern Lincolnshire on a regional scale and to enhance our understanding of the development of this landscape, its use and re-use through time, from early prehistory to the present day.

2.7.2 The ~~Archaeological Research Agenda~~ARA is drawn from the themes contained within the regional research framework (Knight et al., 2012) (**Table 2-1**). However, new research themes and period based questions may emerge (developed as a result of consultation with the Archaeological Contractors' specialists) as a result of on-going evaluation surveys which are being carried out along the route of the pipeline and during preparation of the post-excavation assessment report. Therefore, the provisional research themes and questions proposed at **Table 2-1** will be reviewed, refined and updated during preparation of each SSWSI.

Table 2-1: Provisional Archaeological Research Agenda Topics

Research question	Reference (Knight et. al., 2012)	Research objective
Palaeolithic period (c.950/85-kya to c.9500 cal BC)		
How may studies of fauna, pollen and other organic material from palaeochannels […] and other deposits refine our understanding of the evolving environment, and how may this have varied spatially?	Pleistocene environmental change: 1.5.2	1H
How can we elucidate further the archaeological potential of the submerged landscapes of Doggerland?	General themes: 1.6.3	1H

Mesolithic (c.9500 to c.4000 BC)		
How were sites distributed across low-lying and upland areas, and in particular how many sites might be concealed beneath alluvium, colluvium and other masking deposits or beneath the sea?	Spatial distribution of activity: 2.2.2	2B, 2C, 2D, 2G, 2I
What range of structural remains may survive on open-air sites across the region (particularly below alluvium and other masking deposits)?	Identification of site types: 2.3.3	2B, 2C, 2G, 2I
What can analyses of palaeochannel fills and other deposits with potential for preserved pollen, charcoal and other organic remains contribute to studies of the earliest stages of woodland clearance and plant domestication?	Environmental change & food procurement strategies: 2.6.1	2A, 2H, 2I
How can we maximise the potential of palaeochannels or coastal peats and other organically rich deposits as sources of data on Early Holocene landscapes and changes in subsistence strategies and diet?	Environmental change & food procurement strategies: 2.6.2	2A, 2H, 2I
Neolithic, Early to Middle Bronze Age (c.4000 to 1150 BC)		
To what extent may hunter-gatherer subsistence traditions have continued into the Neolithic?	Continuity of hunter-gatherer traditions: 3.2.1	3E, 3I
How may environmental sampling strategies assist in elucidating the transition from later Mesolithic to earlier Neolithic economies?	Continuity of hunter-gatherer traditions: 3.2.3	3E
When was the transition from nomadic to semi-sedentary and sedentary communities and to what extent did this vary in different landscapes?	Introduction, character & development of agriculture: 3.3.1	3A, 3E, 3I
How may the region's remarkable variety of upland, lowland and coastal landscapes be surveyed in ways that would permit recognition of significant intra-regional variations in land use?	Exploitation of landscape zones: 3.4.1	3D, 3E

Can we identify locations with a high potential for elucidating variations in arable, pasture and woodland cover between ecological zones (e.g., palaeochannels)?	Exploitation of landscape zones: 3.4.2	3D, 3E, 3I
Can we further refine our knowledge of the selective use of particular landscapes for ritual, agriculture and other activities?	Exploitation of landscape zones: 3.4.3	3E, 3F, 3G
Can we obtain a clearer understanding of temporal and spatial variability in the duration of settlement activity?	Settlement patterns: 3.5.2	3A
Late Bronze Age, Iron Age (c.1150 BC to AD 43)		
How can we expand our knowledge of first millennium BC activity in areas with a poor record of settlement?	Site visibility, prospection & landscape exploration: 4.2.3	4C, 4I
Why are sites of this period comparatively rare in the archaeological record?	Late Bronze Age & Early Iron Age settlement: 4.3.1	4A, 4B, 4C, 4I
How may nucleated and other settlements have developed in the Roman period?	Late Iron Age settlements: 4.5.3	4E
Can we shed further light upon the development of field and boundary systems?	Field systems & major linear boundaries: 4.6.1	4C, 4F
What roles may wet, and other natural locations have performed and how might these have changed over time?	Ritual & structured deposition & religion: 4.7.2	4H, 4J
Can we chart more closely the processes of woodland clearance and agricultural intensification, their impact upon alluviation and colluviation, and variations between different areas?	Agricultural landscape & landscape: 4.8.1	4C, 4F, 4J
How may diet and land-use have varied over time and between different ecological zones? Can we identify specialist pastoral zones and elucidate coastal resource exploitation strategies?	Agricultural landscape & landscape: 4.8.2	4C, 4F, 4J

How can we add to our existing knowledge of industries and crafts in this region, particularly the extraction and smelting of iron and lead, salt production and quern manufacture?	Finds, craft, industry & exchange: 4.9.1	4C, 4G
Romano-British (AD 43 to c.410)		
How did the Conquest impact upon rural settlements and landscapes?	Rural settlement patterns & landscapes: 5.4.1	5C, 5H, 5I
How did rural settlements relate to each other and to towns and military sites, and how may this have varied regionally and over time?	Rural settlement patterns & landscapes: 5.4.3	5B, 5C, 5H, 5I
How did field and boundary systems relate to earlier systems of land allotment, and how did these boundary networks develop over time?	Rural settlement patterns & landscapes: 5.4.4	5C, 5H, 5I
What patterns can be discerned in the location of settlements in the landscape?	Rural settlement patterns & landscapes: 5.4.5	5H, 5I
How is the upland-lowland divide manifested in the regional agricultural economy and other aspects of the archaeological record?	Agricultural economy: 5.5.1	5E, 5H
How did integration into the Roman Empire impact upon the agrarian economy, including the introduction of new crops, herbs and fruits?	Agricultural economy: 5.5.2	5E
Can we chart more closely the processes of agricultural intensification and expansion and the development of field systems?	Agricultural economy: 5.5.4	5C, 5E, 5H, 5I
What production techniques and exchange networks were involved in the manufacture and marketing of salt and building materials?	Artefacts: production, distribution & social identify: 5.6.4	5B, 5J
To what extent may communication routes have been influenced by Late Iron Age settlement patterns and routes of movement?	Roads & waterways: 5.7.3	5G, 5I, 5J

Early Medieval (c. AD 410 to 1066)		
Can we identify social/political boundaries (e.g., surviving linear earthworks and natural barriers) and /or estate centres?	Demography & the identification of social groups: 6.1.7	6F, 6G, 6I
Can 'sub-Roman' or 'British' cemeteries and cemeteries dating from the late seventh to ninth centuries be identified?	Ritual and belief: 6.2.2	6B
What roles may rivers have played as corridors for the movement of goods and people, and how might these have varied over time?	Roads & rivers, transport routes and cultural boundaries: 6.3.3	6H, 6I, 6J
What impact may Germanic and Scandinavian immigration have had upon rural settlement patterns?	Rural settlement patterns: 6.4.1	6C, 6G
Can we elucidate the production and distribution of Early Medieval salt?	Industry, trade & the emergence of a monetary system: 6.6.3	6H
Medieval (1066 to 1485)		
How can we shed further light upon the origin and development of dispersed hamlets and farms in champion and pastoral areas?	Rural settlement: 7.2.2	7E, 7I
Can we clarify further the processes of settlement desertion and shrinkage, especially within zones of dispersed settlement?	Rural settlement: 7.2.4	7E, 7F
Can we improve our knowledge and classification of moated sites in the region, and how can environmental data add to our knowledge?	Manors & manorial estates: 7.3.3	7F
What can we deduce about changes in woodland management and animal or crop husbandry (including new crops, crop rotation, field systems, etc.)?	Agrarian landscape & food-producing economy: 7.7.3	7F, 7I
What can environmental remains teach us about diet and living conditions in rural and coastal communities?	Agrarian landscape & food-producing economy: 7.7.4	7F

How best may we enhance study of the origins and development of early land reclamation and drainage?	Agrarian landscape & food-producing economy: 7.7.6	7E
Post-medieval and Modern (1485 to present)		
How can we improve our understanding of the early landscapes of enclosure and improvement and the interrelationship between arable, pasture, woodland, commons and waste?	Agricultural landscapes & the food-producing economy: 8.3.1	8E
How did water management and land drainage change the landscape during this period?	Agricultural landscapes & the food-producing economy: 8.3.2	8E
Can we enhance our understanding of the houses of the rural poor?	Rural settlement patterns & building traditions: 8.4.1	8A, 8C
How can we refine our knowledge of Civil War defences and siege works?	Battlefields & fortifications: 8.7.2	8J
What linear transport features, river/canal craft and associated structural remains have survived, and how does this vary regionally?	Transport infrastructure: 9.4.1	9D
What roles have different transport systems played in the development of industry, commerce, agriculture and settlement?	Transport infrastructure: 9.4.2	9D
How has the relationship between linear transport systems developed over time (e.g., shift from canal to rail transport)?	Transport infrastructure: 9.4.3	9D
What survives of country estates, parks and gardens, how are they distributed, and how should they be classified?	Estates, parks, gardens & woodlands: 9.5.2	9H
What was the impetus for the development of estate farming and rural agricultural industries, and what has been the landscape impact?	Agriculture: 9.6.1	9G
How did Parliamentary enclosure and other agricultural improvements (e.g., water management) impact upon the rural landscape?	Agriculture: 9.6.2	9G
How are military sites distributed across the regions?	Military sites: 9.8.2	9H

2.7.3 Recently, several new research themes related to landscape evolution on the Outmarsh have been proposed by Green (Green, 2023: Section 4, Directions for future research):

- Additional investigations into, and monitoring of, the submerged and buried fragments of the pre-inundation landscape (outcrops that occur on the coastline itself appear to have suffered considerably from erosion and loss in recent times);
- Further borehole/auger and geoarchaeological surveys to add to the knowledge of landscape evolution over time; and
- Studies that use intertidal and offshore data.

2.7.4 The mitigation programme can also contribute to technical research development. Geophysical survey information has been collected across the Site and a programme of extensive trial trenching is also on-going: the mitigation phase offers the opportunity to further collate and assess this survey information, especially where subsequent excavation evidence becomes available.

3 Strategy for Archaeological Mitigation

3.1 Introduction

3.1.1 In accordance with National Policy Statements and National Planning Practice Guidance, the design of the pipeline route has been developed to mitigate impact upon archaeological remains. Wherever possible, the impact of the Proposed Development upon archaeological resources has been minimised or avoided through design. During the detailed design stage and the construction stage priority will be given to the preservation/conservation of archaeological remains within the Order Limits. Where avoidance of remains is not possible, measures ~~will~~ may include protection of remains within working areas and preservation of archaeological remains that are required to be covered over temporarily, e.g. in temporary construction compounds or beneath temporary roads (see sections 3.4 and 3.5 of this document), subject to approval by the relevant Viking CCS Heritage Consultees.

3.1.2 In respect of archaeological remains within the footprint of the Proposed Development, a comprehensive programme of archaeological mitigation fieldwork and recording will be implemented by the appointed Archaeological Contractor during the Pre-construction Activities and Construction Works stages. This will include archaeological excavation, recording, reporting, publication, and dissemination of the results to a wide audience, including engagement with local communities. The archaeological mitigation programme will address the Archaeological Research Agenda (ARA; see section 2.3 of this document) and will be undertaken to a high practicable standard of mitigation, applying a question-based research strategy. The question-led approach will strategy take account of the results of the completed trial trenching programme and will aim to contribute to the corpus of archaeological research and understanding to mitigate the loss of archaeological remains.

3.2 Scope of Archaeological Mitigation

3.2.1 The archaeological mitigation requirements will apply (to the extent necessary~~,~~ (as set out in the relevant SSWSI for approval by the relevant Viking CCS Heritage Consultees), including industry standard practice and control measures for environmental impacts arising during the relevant works) to the areas and works required for construction of the authorised development.

3.2.2 Following construction of the pipeline the ground will be reinstated and the land will be returned to its previous use. There would be no impacts on buried archaeological remains during the Operation phase. Decommissioning activities will take place in relation to the above ground installations only, as the below-ground pipeline infrastructure would be left in situ once operation ceases. As such there would be no further impacts on archaeology and heritage receptors in relation to Decommissioning of the pipeline element of the authorised development. Consequently, as noted above (paragraph 1.1.11), no archaeological mitigation is proposed in respect of the Operation or Decommissioning stages of the authorised development. Provision will be made in the Decommissioning Environmental Mitigation Plan (DEMP) to accommodate appropriate archaeological mitigation in circumstances where removal of a section of the pipeline is required.

3.3 Phasing of Archaeological Mitigation

3.3.1 Most of the archaeological mitigation fieldwork (such as archaeological excavation and recording, geoarchaeological investigations, etc.) will be undertaken by the Archaeological Contractor during the Pre-Construction Activities stage of the construction programme:

archaeological mitigation fieldwork during the Construction Works stage will generally be limited to archaeological monitoring and recording, as outlined below and in Part Two of this document. The Contractor(s) appointed to undertake the construction ('the Contractor') will produce a Construction Environmental Management Plan (CEMP) (based on and incorporating the requirements of the Draft CEMP) that set out how the requirements for archaeological mitigation at each stage will be implemented.

Pre-Construction Activities

3.3.2 Construction works are provisionally planned to start in late 2026 (subject to access to land), following the appointment of a construction contractor. Pre-construction activities, including pre-commencement surveys, are planned to start in Q4 of 2025. The pre-commencement surveys will include intrusive archaeological investigations and investigations for the purposes of assessing ground conditions and remedial work in respect of any contamination or other adverse ground conditions.

3.3.3 All identified pre-construction archaeological mitigation investigations will take place pre-construction. Sufficient time will be programmed prior to any construction commencing to complete the necessary on-site archaeological works. In the exceptional circumstance that ~~If~~ s~~S~~ite conditions prevent archaeological investigations at the pre-construction stage, limited archaeological fieldwork may be required during the construction works stage. It is anticipated that such circumstances will generally be limited to small scale works. These works would be completed at the construction works stage.

3.3.4 Archaeological mitigation works anticipated to be completed during the pre-construction stage are discussed further in Chapter 6.

Construction Works

3.3.5 Site preparation and construction works are currently planned to commence in ~~Q4 of 2025~~late 2026, and it is anticipated that the Proposed Development would be operational in late 2027 / early 2028. While broadly sequential, some phases of the pre-construction and construction stages may overlap both in space and in time.

3.3.6 Archaeological mitigation works anticipated to be completed during the construction stage are discussed further in Chapter 6.

3.4 Temporary Construction Compounds

3.4.1 Three construction compounds are proposed, each of which will include pipe storage areas, welfare facilities, and plant storage and maintenance areas, as follows:

- a North Compound, located south of Habrough Roundabout and the A160 covering an area of approximately 2.15 ha of arable land with access from Habrough Road;
- a Central Compound, located south of Laceby and east of Barton Street (A18) covering an area of approximately 1.71 ha of arable land with access from the A18; and
- a South Compound, located at the car park on the former TGT site accessed from Mablethorpe Road, covering an area of approximately 1.3 ha of brownfield land).

3.4.2 In addition, temporary laydown, parking, and welfare areas will be required at certain access points along the pipeline route.

3.4.3 North Lincolnshire Council have indicated that no archaeological mitigation is required in respect of the North Compound (land here was previously utilised as a compound during

highway works and archaeological investigations were completed at that time) (see North Lincolnshire Council Local Impact Report [REP1-062]).

3.4.4 The South Compound is located in an area of existing hardstanding (car parking) construction of which is likely to have removed any archaeological deposits; no archaeological mitigation is proposed here.

3.4.5 The Central Compound and temporary laydown, parking and welfare areas are situated within agricultural land. Where required, the topsoil will be stripped and stored on-site for later respreading, and the construction compounds will be established utilising a geotextile membrane and stone surface hardstanding. Requirements for archaeological mitigation will be confirmed following completion of the trial trenching programme.

3.4.6 If archaeological remains requiring protection are identified at these locations, then surface disturbance will be minimised to ensure no impact to below-ground remains, with topsoil retained in situ and protected with a geotextile membrane and imported stone or track matting (bog mats) to allow preservation of archaeological remains in situ. However, in the event that ground disturbance is proposed where archaeological remains have been identified, then a SSWSI shall be prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer, which will set out the approach to assessment and mitigation which may include parts of these areas being subject to preservation (see section 4.8 of this document).

3.5 Temporary Access Routes

3.5.1 A haul road or running track will be constructed along the entire working width of the pipeline where practicable. The haul road will be directly onto the sub-soil but depending on ground conditions and weather conditions a geotextile membrane and stone surface and/or bog-mats may be used in selected areas to enable traffic movements. Temporary access routes will be constructed and maintained as necessary for transporting materials from the public highway to the working width (see ES Volume II – Chapter 3: Description of the Proposed Development. Document Reference: EN070008/APP/6.2.3)[APP-045]. The temporary access routes would typically be 4.5 m wide and up to 9 m wide at passing places, which with areas for soil storage and drainage between the track and the fence line would give a maximum swathe of 12 m.

3.5.2 Where archaeological remains that require protection are identified in the access routes or haul road, topsoil will be retained in place and track matting (bog mats) or ground protection using a suitable barrier membrane with overlying fill will be installed; the preferred method of protection will depend on the ground conditions and the nature and sensitivity of the archaeological remains: requirements for archaeological mitigation will be confirmed following completion of the trial trenching programme.. The ground protection will be installed in accordance with a Method Statement to be prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer. In the event that ground protection is not feasible or practicable in these areas then a SSWSI shall be prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer, which will set out the approach to assessment and mitigation which may include parts of these areas being subject to preservation.

3.6 Trenchless Crossings

3.6.1 At several locations the pipeline will cross railways, roads, other utilities and watercourses. In some instances, the crossing will be made using an open cut technique; however, where this method is impracticable, trenchless crossing techniques will be used which would typically require a wider than standard 30 m working width. Currently two techniques are proposed: Guided Auger Boring (working width of 45 m x 25 m) and Horizontal Directional Drilling (HDD) (working width of 40 m x 85 m on launch drill side and 20 m x 20 m on the reception side, together with a pipe stringing zone that is 10 m wide and as long as the crossing length).

3.6.2 There are currently approximately seven locations where guided auger bore crossings are required (at detailed design these may be replaced by HDD crossings):

- Hornsea Cables and gas pipeline crossing, south-west of Immingham (c. 240 m length);
- Crossing of A46 Road and Old Main Road (c. 240 m length);
- Waithe Beck, east of Keelby, (c. 384 m length);
- Greyfleet Drain, north of Grimoldby, (c. 384 m length);
- B1200 Manby Middlegate Road and drains, east of Grimoldby, (c. 240 m length);
- Long Eau, Head Dike Drain and Willow Row Bank, east of Grimoldby, (c. 384 m length); and
- A1031 Mablethorpe Road and drain, west of the former TGT site, (c. 240 m length).

3.6.3 There are four crossings where HDD is proposed:

- Golf Course/Childrens Avenue South of P66 (c. 636 m or c. 240 m length depending on which option is required);
- North Beck Drain near Newstead Farm (c. 544 m length);
- River Ludd/Louth Canal, north-east of Louth (c. 540 m length); and
- Old Engine Drain and Great Eau, west of Theddlethorpe (c. 384 m length).

3.6.4 Trenchless crossings will require localised excavation for the commencement of the technique (access and exit chambers). In areas where archaeological remains are identified the locations of the access and exit chambers will be subject to archaeological investigation, including consideration of geoarchaeological potential. The mitigation requirements will depend on the scale of the impact and will be described in a SSWSI to be prepared by the Archaeological Contractor, in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer.

3.7 Topsoil Stockpiles

3.7.1 Topsoil stockpiles will be managed in accordance with the Outline Soil Management Plan (ES Volume IV - Appendix 10-1: Outline Soil Management Plan. Document Reference: EN070008/APP/6.4.10.1) [REP2-018] which will be developed by the Contractor at the detailed design phase. It is anticipated that in most locations the excavated soil will be stored along the margin of the working area and that the use of dumper trucks will not be required.

3.7.2 Stockpiles will also be used to screen some working areas of the Site, such as parts of compounds, from the public and to lessen the impact on views from sensitive receptors.

Stockpiles will normally be no more than 3 m high. The existing topsoil under and around the stockpiles will be retained in situ.

3.7.3 Where archaeological excavation and recording is required to mitigate the impact of the works, based on the results of the trial trenching, the archaeological mitigation work will take place before the topsoil stockpile is placed in the relevant area. Where archaeological remains are to be buried temporarily beneath topsoil stockpiles a Method Statement will be prepared by the Contractor in consultation with the Archaeological Contractor, describing the stockpile requirements. The Method Statement will be prepared in consultation with the Viking CCS Heritage Consultees ~~and approved by the relevant local authority Archaeological Officer. The Method Statement will be prepared~~ with reference to the guidance on preserving archaeological remains published by Historic England (Historic England, 2016a).

3.7.4 Where topsoil is to be stockpiled as part of the archaeological mitigation works, the methods will be included in a SSWSI prepared by the Archaeological Contractor, in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer.

3.8 Ground Investigation and Other Intrusive Surveys

3.8.1 The DCO will provide powers to undertake any necessary additional geotechnical or other intrusive surveys. The requirements for any necessary archaeological investigation during geotechnical or other intrusive surveys would be set out within a SSWSI, to be prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer. Archaeological mitigation may take the form of targeted archaeological monitoring and recording and/or archaeological excavation and recording, where relevant. Archaeological mitigation in respect of any works carried out for the assessment or remediation of contaminated land, if required, will be undertaken in accordance with Historic England guidance including 'Land Contamination and Archaeology' (Historic England, 2017).

3.9 Archaeological Mitigation Measures

3.9.1 In accordance with the commitments identified in the Draft Construction Environment Management Plan (Table 3: Draft Mitigation Register (Construction Phase) (ES Volume IV – Appendix 3-1: Draft CEMP. (Document Reference: EN070008/APP/6.4.3.1), a range of archaeological mitigation measures are proposed, taking into account the form and significance of the archaeological resource that would be impacted by the Proposed Development.

3.9.2 The principal techniques are listed below, and **Table 3-1** describes the scope of these measures and the works stage to which they are relevant.

- Preservation of archaeological remains.
- Archaeological recording:
  - Archaeological Excavation and Recording (strip, map, sample and record).
  - Archaeological Monitoring and Recording.
- Geoarchaeological/palaeoenvironmental investigation.
- Trial trenching/test pits (where additional evaluation is required to inform the appropriate level of mitigation, and/or where access was unavailable prior to Public Examination).

- Archaeological topographic survey.
- Metal detector survey.
- Publication and dissemination.

Table 3-1: Archaeological Mitigation Measures

Recording method / Works stage	Description
Preservation of Archaeological Remains (Pre-construction Activities and Construction Works stages)	An area within the Site that has been excluded from construction activities to preserve archaeological remains, thereby preserving it for later generations. Measures for preservation may include protective fencing, track matting (bog mats) or burying/sealing remains beneath fill material to ensure that they are not disturbed (including use of a protective barrier membrane between the existing ground surface and the fill, and control measures for plant movements at construction).
Archaeological Excavation and Recording (strip, map, sample and record) (Pre-construction Activities stage)	Strip, map, sample and record is a programme of controlled, intrusive fieldwork with defined objectives, which maps, examines, records and interprets archaeological remains within a defined action area. The records made, and the objects and samples gathered during the fieldwork are combined and studied (assessed and if appropriate analysed) and the results published in detail appropriate to the project design. Strip, map, sample and record will be undertaken where significant archaeological remains are either known from assessment or evaluation works ('significant archaeological remains' are those which have potential to address the ARA). The scope and extent of the strip, map, sample and record will be agreed with the Viking CSS Heritage Consultees following the completion of all evaluation stage. It may incorporate simple hand excavated trenches and hand excavated test pits (combined with geoarchaeological sampling and recording where potential has been recognised); where appropriate, areas of targeted excavation ('set piece excavation'), or may require larger areas to be stripped under archaeological supervision prior to hand excavation of features. ~~and will be undertaken where significant archaeological remains are either known from assessment or evaluation works ('significant archaeological remains' are those which have potential to address the ARA).~~ For each action area (or group of action areas which require the same approach, following completion of all evaluation stages and subject to approval by the Viking CCS Heritage Consultees) a SSWSI will be prepared outlining specific excavation measures and scientific sampling strategies applicable to the proposed fieldwork that forms part of the programme of archaeological mitigation. The SSWSI will be prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees and will be agreed with the relevant Viking CSS heritage consultee and approved in writing by the respective local planning authority ~~approved by the relevant local authority Archaeological Officer~~ prior to works commencing in the area to which the SSWSI applies. During the investigation metal detection may also be deployed, for example, across exposed surfaces

Recording method / Works stage	Description
	following soil stripping, during hand excavation, and/or over hand-excavated spoil.
Archaeological Monitoring and Recording (Pre-construction Activities and Construction Works stages)	A programme of observation, investigation and recording of archaeological remains undertaken in specific areas. ~~where the presence of, or moderate potential for, archaeological remains has been demonstrated or can be predicted, but where detailed investigation prior to the main construction programme is unfeasible due to safety or logistical considerations, or undesirable due to environmental or engineering constraints~~. Archaeological Monitoring and Recording will be required following completed evaluation, where the Viking CSS Heritage Consultees consider that there is presence of, or moderate potential for, archaeological remains that do not merit in situ preservation and/or pre-construction strip map and record. The Contractor'(s)' preferred method of working will be controlled as necessary to allow archaeological recording to take place. It also provides the monitoring archaeologist, if needed, the opportunity to identify that an archaeological find has been made which will require additional resources in order to record to a proper standard. During the investigation metal detection may also be deployed.
Geoarchaeology/palaeoenvironmental investigation (Pre-construction Activities and Construction Works stages)	A programme of sample recovery and assessment and/ analysis undertaken to investigate palaeoenvironmental conditions and soil sediment development that may be relevant to the research of action areas or to remains within the vicinity of action areas. Investigations may involve hand excavated trenches and hand excavated test pits or other soil sample retrieval methods (such as augering or boreholes).
Metal Detection within the ploughzone (Pre-construction Activities stage)	A non-intrusive survey technique to recover and record the location of metalwork within a specified area of the Order Limits. It would involve a scaleable strategy to assess and investigate the archaeological potential following desk-based assessment and/or the results of trial trenching or topsoil stripping.
Trial Trenching/Test Pits (Pre-construction Activities stage)	A targeted or sample-based mechanical or hand excavated trench or test pit based investigation to record the presence/absence, extent and character of archaeological remains identified through non-intrusive survey or assessment, and to inform decision making on further mitigation recording that may be appropriate. Likely to be deployed in limited areas along the Proposed Development where additional evaluation is required to inform the appropriate level of mitigation and/or where access was unavailable prior to Public Examination: the finalised DAMS will identify any relevant areas where trial trenching/test pits are required.
Archaeological Topographic Survey (earthwork survey) (Preconstruction Activities stage)	A measured survey undertaken to record the shape and topography of the ground surface and any relevant components. It would include both a drawn and written record, and depending upon the level of detail that is required it could also include a photographic record. Typically, it would be applied to both upstanding archaeological remains and features that contribute to the historic landscape character. Depending upon ground conditions it may be necessary to remove vegetation before the survey, this would be done under archaeological supervision in

Recording method / Works stage	Description
	accordance with a Method Statement to ensure the clearance is done in a controlled manner and does not impact on the remains.
Publication and Dissemination (Pre-construction Activities, Construction Works and Operation stages)	Interim reports and fieldwork updates that would be produced during the investigations as a result of assessment and analysis of the results, and a final academic report(s) and popular booklets would be prepared at the end of the fieldwork. The project archive will be held for long-term storage at the recipient archive storage facility.

3.10 Provisional Action Areas for Archaeological Mitigation

3.10.1 A total of ~~22~~ 36 [HOLD – provisional number – to be confirmed] provisional action areas have been identified, based on the results of the geophysical survey and the preliminary trial trenching results (where available), that require either preservation of archaeological remains in situ or archaeological recording (preservation by record: Archaeological Excavation and Recording (AER)/ Archaeological Monitoring and Recording (AMR)); these provisional action areas are identified in **Table 3-2** and shown on **Figures 1 and 2**.

3.10.2 These provisional action areas have been identified based on desk-based assessment, aerial survey review, geophysical survey and, where available, preliminary trial trenching results. A summary of the archaeological potential of each provisional action area is provided in Table 3-2.

Status of Provisional Action Areas and Mitigation Proposals

3.10.3 **Please note that the absence in this draft DAMS of Provisional Archaeological Action Areas in any given section of the DCO Site Boundary does not denote that there will be no archaeological mitigation in these areas. The Provisional Archaeological Action Areas listed in Table 3-2 and shown on Figures 1 and 2 denote only the areas where the requirement for AER or AMR has already been identified. Table 3-2 and Figures 1 and 2 will be updated to show the extents of additional areas of AER and AMR, as relevant, as the DAMS is finalised following completion of the trial trenching.**

3.10.4 **Trial trenching is ongoing in a number of the provisional action areas: for ease of reference, trial trenches excavated to ~~1st August~~13th September 2024 are shown on Figure 3. The number, location and extent of action areas for archaeological mitigation in all cases is subject to confirmation following completion of trial trenching fieldwork and reporting. New action areas for investigation may be identified as a result of emerging results from the evaluation surveys and as a result of unexpected discoveries.**

3.10.5 **In all cases, the mitigation measures will apply to the part of each action area identified in Table 3-2 that will be impacted by the construction footprint of the Proposed Development (this will be defined as detailed design of the pipeline alignment is finalised taking into account the results of the completed trial trenching and opportunities for avoidance of archaeological sites). The extent of each mitigation areas will be confirmed in the individual SSWSIs.**

Table 3-2: Provisional Action Areas for Archaeological Mitigation

Action Area ref.	*Section*	*Field Ref.*	*Location*	*Archaeological Potential*	*Action***
1	1	1, 2 ~~[3]~~	South of Rosper Road	Prehistoric activity and Iron Age / Romano-British occupation along the edge of a former buried shoreline. This action area was trial trenched as part of the Humber Zero project[2].	~~TBC~~AER (SMS)
2	1	6, 7	North of Manby Road	Land close to former shoreline. This land was not surveyable as part of the geophysics programme due to the presence of above ground infrastructure.	AMR
3~~2~~	1	11	South of Manby Road	Enclosures of likely Iron Age or Roman date, possibly associated with salt working activity. Linear and curvilinear geophysical anomalies within an area c.100m×70m towards the north of Field 11 appear to form at least four conjoining enclosures, with a possible double-ditched track running south to north across the centre. Inside the eastern half of the complex is a concentration of strong dipolar magnetic anomalies consistent with magnetically strongly enhanced deposits; some of these anomalies could be related to salt working. ***Trial trenching scheduled.***	~~TBC~~AER (targeted excavation area / SMS)

[2] As Action Area 1 (Fields 1 and 2) is coincident with the VPI Carbon Capture Site, the same mitigation strategy will be applied and the proposed mitigation area reflects the extent of the mitigation area proposed in the WSI submitted to the local planning authority

Action Area ref.	Section	Field Ref.	Location	Archaeological Potential	Action**
4	1	22	Northwest of Immingham Golf Club	Rectilinear enclosures. Linear and curvilinear anomalies, consistent with infilled cut features such as ditches, appear to demark two enclosures in the centre of the survey area. ***Trial trenching scheduled.***	AER (SMS)
5	1	22	Northwest of Immingham Golf Club	West of area of rectilinear enclosures (action area 4): no coherent anomalies of likely archaeological origin. ***Trial trenching scheduled.***	AMR
~~3~~6	1	~~22,~~ 23, 24~~, 25~~	North-east of Glebe Farm	Romano-British rectilinear enclosures with internal divisions ~~in the north of Field 22, in Field 23 and~~ in Field 24, with a possible double-ditched track running south to north on the eastern side of the enclosures in Field 24. Overlapping geophysical anomalies suggest more than one phase of activity associated with the complex and linear anomalies mark smaller enclosures both in and outside the larger enclosures. Extends into Field 23 to the east alongside an existing pipeline. Trial trenching ~~to date~~ has investigated a number of the enclosure ditches together with pits and a possible cremation grave (Trenches 41-49).. ~~***Trial trenching scheduled.***~~	~~TBC~~AER (targeted excavation area)

Action Area ref.	Section	Field Ref.	Location	Archaeological Potential	Action**
7	1	25	North-east of Glebe Farm	Geophysics indicates a possible double-ditched track running south to north on the eastern side of the enclosures in Field 24 extending southwards through Field 25. Trial trenching in Field 25 recorded a ditch and a number of pits (Trenches 50, 55, 58, 60), but did not identify the trackway.	AER (SMS)
~~4~~8	1	29	South of Habrough Road to the A180	Linear anomalies, consistent with infilled cut features such as ditches, demark a possible rectilinear enclosure, c.70m×25m, near the northern boundary of Field 29a. Trial trenching recorded ditches and furrows (Trenches 77-86). ~~***Trial trenching scheduled.***~~	~~TBC~~AER (SMS)
~~5~~9	2	32, 33	W & E of Roxton Road	A group of linear and curvilinear geophysical anomalies towards the centre of Field 32 and in the northern part of Field 33 form fragmented complexes each of two or three enclosures of presumed later prehistoric date. Trial trenching east of Rpxton Road has recorded a ditch and furrows in this area (Trench 110). ***Trial trenching scheduled.***	~~TBC~~AER (SMS)
~~6~~10	2	38	East of Roxton Farm	Multiple linear, curvilinear and discrete geophysical anomalies form two distinctive clusters concentrated in the north and south of Field 38. The northern cluster form a possible enclosure system with internal divisions visible. The southern anomalies also form possible enclosures but in character are more	~~TBC~~AER (SMS)

Action Area ref.	Section	Field Ref.	Location	Archaeological Potential	Action**
				fragmented and discrete compared to the northern focus. ***Trial trenching scheduled.***	
11	2	41	South-east of Roxton Farm	Linear, curvilinear, rectilinear and circular anomalies could form part of a former field system or parts of enclosures. Trial trenching has located a small number of ditch and gully sections and a pit (Trenches 135, 138, 139)	AER (SMS)
12	2	43, 44	North-east of Greenland Farm	Trial trenching has recorded an undated ditch in an area of ridge and furrow (Trench 148).	AMR
13~~7~~	2	45, 46	South of Greenlands Farm/Keelby Rd	Across Field 45 multiple linear, rectilinear, curvilinear and circular geophysical anomalies form a possible Romano-British settlement with field system and double-ditched trackway running to the west on the north to south alignment. Anomalies form visible enclosures with multiple internal divisions. The entire focus covers the area of approximately 1.8ha and continues to the south and possibly to the east and north-east beyond the survey area extent. The complex is known from previous geophysical survey and is recorded as a complex of Roman enclosures alongside a trackway (MNL2689). Trial trenching has confirmed the survival of multiple ditches, pits and an area of burning (Trenches 152-158)~~but recovered no dating evidence~~. ~~***Trial trenching scheduled.***~~	~~TBC~~AER (targeted excavation area)

Action Area ref.	Section	Field Ref.	Location	Archaeological Potential	Action**
14	2	49	West of White Lodge	Trial trenching in an area where geophysical survey encountered green waste on the field surface and anomalies consistent with former of ridge and furrow has identified a number of ditches, furrows and a posthole (Trenches 165-169).	AER (SMS)
15	2	50	North of Riby Road	A few amorphous anomalies within a spread of green waste could indicate parts of former enclosures.	AMR
16	2	50	North of Riby Road	Trial trenching identified a number of ditches, furrows and pits in area where geophysical survey recorded linear and rectilinear anomalies possibly indicating parts of former enclosures (Trenches 173, 174, 175).	AER (SMS)
17	2	50	North of Riby Road	A few linear and rectilinear anomalies within a spread of green waste could indicate parts of former enclosures. One pit was recorded in Trench 179.	AMR
18	2	52a	South of Riby Road	Geophysical survey identified anomalies that likely relate to natural, agricultural or modern features or objects. Trial trenching located an undated ditch (a large ferrous spread was identified surrounding the ditch from geophysical survey) (Trench 183).	AMR
19~~8~~	2	57a, 57b	North of Barton Street	In Field 57a, trial trenching recorded ditches, pits, postholes and a gully in an area of scattered discrete positive anomalies possibly reflecting an enclosure (Trenches 211, 213). A cluster of linear, curvilinear, and circular	~~TBC~~AER (SMS)

Action Area ref.	Section	Field Ref.	Location	Archaeological Potential	Action**
				geophysical anomalies in the central part of Field 57b could indicate a former enclosure. Trial trenching recorded ditches, gullies, a posthole and a pit (Trench 213). ~~***Trial trenching scheduled.***~~	
20	3	70, 70a	South of Walk Lane	West of possible settlement enclosures (AA23) (MNL4954). possible double-ditched trackway extending into the north of AA22. ***Trial trenching scheduled.***	AER (SMS)
~~9~~21	3	70/70a	~~North~~ South of Walk Lane	In the central part of Field 70/70a a series of linear, curvilinear, rectilinear and discrete geophysical anomalies seem to create a cluster of possible enclosures or field divisions. Many anomalies overlap on each other, which could suggest multi-phased usage of this area. Extensive agricultural activity visibly limits the interpretation as cluster is cut with multiple ploughing lines. Previously known (MNL4954). This action area lies north and north west of the scheduled Civil War fort. Metal detecting recovered 16 artefacts, most of which are likely to be related to agricultural activities ~~***Metal detecting and t***~***T***~***rial trenching scheduled.***	~~TBC~~AER (targeted excavation area)

Action Area ref.	Section	Field Ref.	Location	Archaeological Potential	Action**
22	3	70	South of Walk Lane	Anomalies indicative of natural intertidal deposits in the eastern part of Field 70. ***Trial trenching scheduled.***	AER (SMS)
23	3	71, 72, 73, 74, 75, 77	North and east of Welbeck Hill	Multiple geophysical anomalies of no certain archaeological origin north of the scheduled Civil War fort and east of the Anglo-Saxon burial ground on Welbeck Hill. ***Trial trenching scheduled.***	TBC
~~17~~24	3	93, 95	North of Ashby cum Fenby	Trial trenching (Trenches 422, 423,425) revealed a north–south aligned ditch containing Late Prehistoric pottery which cut the eastern side of a linear feature (possibly a channel or natural formed gully), both features aligned with the eastern side of a larger geophysical anomaly interpreted as geological in nature; a curvilinear geophysical anomaly was detected in the northern part of Field 93. In the western corner of Field 95 a semi-annular geophysical anomaly with a circular positive anomaly in the centre could indicate parts of a possible ring-ditch with some internal structures. Trial trenching recorded two ditches, including an east-west aligned ditch (42504) that produced a large amount of Late Bronze Age pottery.	AER (SMS)
~~10~~25	3	102, 103	South of Thoroughfare	In the southern part of Field 102 strong, positive geophysical anomalies, indicative of ditch-like features, as well as pit like anomalies form a regular pattern that continues as a more defined	AER (SMS)

Action Area ref.	Section	Field Ref.	Location	Archaeological Potential	Action**
				cluster of regular anomalies within Field 103, possibly forming parts of a former settlement that continues to the north-east beyond DCO Site Boundary. ***Trial trenching scheduled.***	
2611	3	109	North of Grainsby Grange	A series of linear, rectilinear, and circular geophysical anomalies in the northern part of Field 109 cover an area of approximately 2.5ha and suggest the existence of an undated settlement extending beyond the survey extent to the west and to the east. ***Trial trenching scheduled.***	TBCAER (SMS)
2712	3	115	North-west of Westfield Farm	In the southeastern corner of the survey area, a set of geophysical anomalies form rectilinear structures and possibly reflect an enclosure system or a former field system. Some circular anomalies could represent post holes. ***Trial trenching scheduled.*** Trial trenching identified a number of ditches and pits (Trenches 520-522)..	TBCAER (SMS)
28	3	122, 123	North of Autby House	Trial trenching recorded ditches and occupation layers associated with a possible rectilinear enclosure (Trench 549-551).	AER (SMS)
29	3	124	East of Autby House	Ditches and a discrete feature (Trenches 558, 559) in area of anomalies including a possible pit.	AMR
1330	3	127/128, 129, 130	East of A16, Damwells Farm	A series of linear, curvilinear, rectilinear and pit like geophysical anomalies create a regular	TBCAER (SMS)

Action Area ref.	Section	Field Ref.	Location	Archaeological Potential	Action**
				cluster and could indicate a settlement that continues across Area 128 into Areas 129 and 130. Trial trenching examined ditches and pits that produced animal bone and pottery, ceramic building material, slag, burnt flint, and a gully and a flint scatter (including possible pieces of debitage and two possible cores). A possible palaeochannel was also identified in the trial trenches. ~~***Trial trenching scheduled.***~~	
~~14~~31	3	135	South of Station Road	In the northern part of Field 135 a broad cluster of linear and rectilinear geophysical anomalies suggest a former enclosure system. Trial trenching has recorded numerous ditches and gullies (Trenches 602-609). ~~***Trial trenching scheduled.***~~	~~TBC~~AER (SMS)
~~16~~32	4	149, 150	West of Grange Farm	A strong, curvilinear geophysical anomaly in the northeastern part of Field 149 and several discrete linear and circular anomalies in the southeastern part of Field 150a could represent former enclosures. Trial trenching revealed ditches, gullies and postholes that produced animal bone, pottery, flintwork and ceramic building material (Trenches 673, 674, 682). Spot dating indicates a Late Prehistoric / Iron Age date.	AER (SMS)

Action Area ref.	Section	Field Ref.	Location	Archaeological Potential	Action**
~~20~~33	4	160	East of Brackenborough Road	Field 160 was not available for geophysical survey. Trial trenching identified a gently curving undated gully with no finds~~.~~ (Trench 721).	AER (SMS)
34		177	North of South Cockerington	Linear and Circular Anomalies of uncertain origin. Trial trenching identified numerous ditches, pits and a gully (Trenches 785-791)	AER (SMS)
35	4	191, 192	North of Manby Middlegate	**Trial trenching** in Field 191 revealed a series of parallel furrows that correspond to geophysical anomalies interpreted as ridge and furrow. In Field 192, trial trenching recorded an undated ditch terminal and a furrow. A retouched flake and sub-parallel flaked scraper with retouched edges both of possible Neolithic date were recovered from the topsoil (Trenches 874-878).	AER (SMS)
36	5	196, 197, 198	East of Causeway Bridge Farm	Field 196 was not available for geophysical survey. Trial trenching here located an undated ditch (Trench 196). In Field 197, trenching recorded undated furrows corresponding to geophysical anomalies, and an undated ditch. Romano-British C2nd - 4th AD greywares were amongst the finds. In the western part of Field 198 a very regular arrangement of rectilinear, linear and circular geophysical anomalies could represent part of a potential settlement, likely extending to the west. Trial trenching revealed ditches containing pottery and charcoal, enclosure ditches containing abundant finds including animal bones, charcoal, oyster shell,	AER (SMS)

Action Area ref.	Section	Field Ref.	Location	Archaeological Potential	Action**
				Romano-British C2nd-4th greyware pottery, and flint, and an inhumation grave. All of the ditches corresponded to geophysical anomalies.	

Action areas requiring preservation of archaeological remains

~~3.10.3~~3.10.6 There are xx action areas identified for preservation of archaeological remains and for these sites the measures to be used comprise protective fencing, track matting or cover and fill, or a combination of measures. [HOLD – to be confirmed in final DAMS]

Action areas requiring archaeological recording

~~3.10.4~~3.10.7 Archaeological recording is required at ~~22~~ 36 action areas [HOLD – provisional number – to be confirmed in final DAMS]. Excluding evaluation surveys that may need to be completed at the Pre-construction Activities stage, mitigation measures will include but are not limited to Archaeological Excavation and Recording, t~~T~~argeted Archaeological Monitoring and Recording, and geoarchaeological investigation.

Action areas requiring archaeological evaluation

~~3.10.5~~3.10.8 There are also xx action areas where archaeological evaluation surveys could not be completed prior to Examination, and which require detailed and /or confirmatory assessment to inform the Site mitigation requirements. [HOLD – to be confirmed in final DAMS]

Identification of additional action areas

3.10.9 The draft Strategy is a live document and will remain so, being updated as appropriate, until all evaluation stages are complete. The Strategy will then be comprehensively updated in consultation with the Viking CCS Heritage Consultees, and will form part of the final CEMP for approval by the relevant local planning authorities.

~~3.10.6~~3.10.10 ~~In the event that new action areas are identified as a result of emerging results from evaluation surveys, these will be identified in a SSWSI(s) to be prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer~~.

3.11 Public Archaeology and Community Engagement

3.11.1 As provided for by the Draft CEMP [REP4-027] Table 3, draft Mitigation Register (Construction Phase) ref. D6 (as certified by the DCO) the Archaeological Contractor's specialist will develop a programme of community engagement and outreach based on the Outline Public Archaeology and Community Engagement (PACE) strategy provided at Appendix B of this document.

3.11.2 The aim of the PACE programme will be to raise awareness of the significance of the landscape that the Proposed Development crosses and to encourage the enjoyment, interaction and engagement with the archaeological process and discoveries arising from the mitigation works along the pipeline route corridor.

3.11.3 The objectives of the PACE programme will be:

- Engagement and appreciation: Encouraging engagement with and appreciation of the landscape;
- Advancing knowledge about archaeology along the pipeline route corridor: Advancing public understanding and stimulating public interest in the archaeology of the route corridor;
- Public understanding of developer-led archaeology: Making the archaeological process more understandable to the public, particularly in relation to a major infrastructure project;
- Accessible learning: Creating accessible learning opportunities for people to be involved in actively discovering more about archaeology;

- Disseminating fieldwork information: Disseminating information about results from archaeology fieldwork along the pipeline route to schools, the local community, local societies and groups with a keen interest in history and archaeology, and the academic community; and
- Sharing research: Showcasing the research impact of development-led archaeological fieldwork and how it can inform our understanding of the past with local, national and international audiences.

3.11.4 The PACE programme may include talks and outreach events organised and staffed by the Archaeological Contractor and will be developed in close consultation with the Viking CCS Heritage Consultees and other potential consultees that may include representatives of museums, community networks, civic forums and local archaeology and history groups.

3.11.5 The developed PACE strategy, programme and resourcing will be presented as a Method Statement to be approved by the Contractor and Client and is required to be in place at the beginning of the Pre-construction Activities stage (see section 5 Programme, below). Accordingly, the scoping and consultation stage for the PACE strategy will be completed in advance of commencement of the Pre-construction Activities stage.

3.12 Reinstatement of Earthwork Features

3.12.1 In accordance with Table 3 of the Draft Mitigation Register (Reference Number D7) upstanding earthworks, including ridge and furrow earthworks, that are impacted by construction activities will be reinstated on completion of construction works, once all plant, materials and temporary works/structures are removed. The earthwork features will be reinstated by the Contractor under the supervision of the Archaeological Contractor when the land that has been disturbed as a consequence of the Proposed Development is restored back to its original (pre-development) condition. The Contractor and Archaeological Contractor shall refer to the results from archaeological topographic survey (earthwork survey) for guidance regarding the location, form and scale of the earthworks to be reinstated.

3.12.2 The Archaeological Contractor shall prepare a Method Statement in consultation with the Contractor and the Viking CCS Heritage Consultees that describes the procedure and methods for the reinstatement of earthworks, prior to the start of construction activities. The Archaeological Contractor shall also ensure that these are in line with Historic England guidance (Historic England, 2016b; Historic England, 2008a) and are based on a thorough understanding of the heritage values of the assets, and the impact that the procedure and methods may have on these values (https://historicengland.org.uk/advice/planning/the-reconstruction-of-heritage-assets/historic-englands-approach/#Section1Text).

PART TWO – OVERARCHING WRITTEN SCHEME OF INVESTIGATION

4 Approaches to Archaeological Mitigation

4.1 Contents of the Overarching Written Scheme of Investigation (OWSI)

4.1.1 This OWSI sets out (section 4 of this document) the controlling documents (SSWSI and Method Statements) that will define the scope of archaeological mitigation works to be undertaken in each action area, and the archaeological research agenda that will frame the purpose of the archaeological mitigation works. It also sets out requirements for establishment by the appointed Archaeological Contractor of an archaeological project team and the retention by the Client of an Archaeological Clerk of Works, and procedures in the event of unexpected discoveries and interruptions and delays.

4.1.2 The scope and purpose of the proposed archaeological mitigation techniques and their intended applications to preserve significant remains in situ or by record are outlined, to provide an overarching methodology with which the SSWSI, to be developed by the Archaeological Contractor, must conform as a minimum.

4.1.3 The programming of the archaeological mitigation works before and during construction of the pipeline is considered in section 5 of this document and a strategy for communications and arrangements for monitoring of archaeological works is proposed in section 6.

4.1.4 Finally, requirements for reporting, publication and dissemination of the results of the archaeological mitigation works are set out in section 7 of this document, and requirements for archive preparation and deposition in section 8.

4.2 Site Specific Written Schemes of Investigation (SSWSI) and Method Statements

Site Specific Written Schemes of Investigation (SSWSI)

4.2.1 Each SSWSI will set out in detail specific mitigation measures for the Proposed Development, informed by the Strategy. Existing and emerging results from fieldwork and previous assessment work will inform the design of the mitigation works to be set out in the final DAMS and detailed in each SSWSI. The SSWSIs will be prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees and will be approved by the relevant local authority archaeologist, prior to works commencing in the area to which it applies.

4.2.2 The specification for the archaeological works set out in each SSWSI~~, together with the required method statements~~ to be prepared by the Archaeological Contractor, will be written in accordance with the Strategy and the current Standard and Guidance issued by CIfA, including the CIfA Code of Conduct (CIfA, 2022), and will adhere to all current and relevant best practice, standards and guidance, as updated from time to time (see Appendix A).

4.2.3 An overarching preliminary programme will be included in the Final Archaeological Mitigation Strategy, with the confirmed detailed programme included in each SSWSI. Each SSWSI will set out the timing and order of the investigative works and will include details of how the archaeological programme will interact with other construction activities, and the parties undertaking them, during Pre-construction Activities or Construction Works. Each SSWSI will include a programme for the archaeological work that will be referenced against key milestones/events in the overall design and construction programme.

Method Statements

4.2.4 During both Pre-construction Activities and Construction Works, procedures will be adopted in the CEMP to ensure that sites of archaeological interest are protected. The Archaeological Clerk of Works and / or the Archaeological Contractor will give Tool Box Talks to inform all site personnel of the archaeological and historic environment constraints pertaining to the Site, the protection measures that are required and their obligations under the DAMS and CEMP and generally, to ensure that these measures are put in place and complied with.

4.2.5 In areas where archaeological remains are to be retained (e.g. protected by temporary perimeter fencing, track matting or beneath fill materials) or where archaeological earthworks are to be reinstated, the Archaeological Contractor will prepare a Method Statement(s) at the start of the relevant construction stage in order to describe specific measures to be applied to the action area and following the requirements of the CEMP. The Method Statements will be prepared in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer.

Amendments and Updates to SSWSI ~~and Method Statements~~

4.2.6 Any amendments or updates required post-approval to an SSWSI ~~or Method Statement~~ (for example, in accordance with section 4.5 Unexpected Finds or as a result of iterative development of the site strategy as outlined in section 4.7, below) will be made in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer.

4.3 Archaeological Research Agenda

4.3.1 Relevant CIfA Standards and Guidance (for example, CIfA, 2023d) set out the requirement that a project design shall address clearly defined research questions within the archaeological works programme. The research themes and period-based questions set out in the Archaeological Research Agenda (see section 2.3 of the DAMS, above) provide a framework and context for the incorporation of the results of the mitigation programme and will be developed through each SSWSI to include detailed research questions relevant to each action area.

4.3.2 The Archaeological Research Agenda provides a framework for focusing archaeological recording work which will ensure that information collected during the course of the proposed fieldwork interventions is valid for meaningful archaeological research through development of detailed research questions. Throughout the design, implementation and review of the Archaeological Research Agenda, a question-led approach will be adopted with decision-making based on the significance of the archaeological remains.

4.4 Archaeological Project Team

4.4.1 The archaeological mitigation works will be delivered by the Archaeological Contractor under the leadership of an experienced project manager. ~~The Archaeological Contractor~~The Archaeological Contractor shall be a CIfA Registered Organisation and will have prime responsibility for delivery of the full programme of archaeological mitigation as set out in the Strategy, including all on and off-site works, technical and non-technical publication and dissemination, and preparation and deposition of the archaeological project archive with the recipient archive storage facility.

4.4.2 The Archaeological Contractor will include as part of their project team named key specialists who will either be site-based or have a regular site presence, or who will be on-call at short notice. These will include (without limitation) the following roles:

- Project manager

- Environmental archaeology supervisor
- Finds co-ordinator/processing specialist
- Lithics specialist with relevant period expertise
- Ceramics specialist with relevant period expertise
- Geoarchaeologist
- Archaeological surveyor
- Digital data co-ordinator/manager
- Human remains specialist
- Animal bone specialist
- Scientific dating specialist
- Conservation specialist
- Metal detectorist co-ordinator
- Public Archaeology and Community Engagement specialist

4.4.3 The names and qualifications of the individuals fulfilling these roles will be provided to the Viking CCS Heritage Consultees for information and comment following appointment of the Archaeological Contractor and shall be identified in each SSWSI. The postholders shall be in place at the start of the mitigation programme and any changes to the named postholders will be notified to the Viking CCS Heritage Consultees, for information and ~~comment~~agreement.

4.4.4 The specialists will be fully integrated into the Archaeological Contractor's project team and will actively input to the design of strategies for each SSWSI, the Public Archaeology and Community Engagement elements, and to advise throughout the fieldwork and post-excavation assessment and analysis work. Regular communication between the specialists and the fieldwork project manager and field staff shall be ensured through off-site planning meetings, site visits and progress meetings.

4.4.5 Archaeological staff (part of the Archaeological Contractor's site team) supervising the investigative works as described in the Strategy shall be highly experienced in directing machine stripping/hand stripping of archaeological sites, with relevant experience in and knowledge of the archaeological character of the area in general. The staff member(s) shall be familiar with the results of the assessment work and evaluation surveys that have been completed.

4.5 Archaeological Clerk of Works

4.5.1 As noted above (section 1.3 of the DAMS) an Archaeological Clerk of Works (ACoW) will form part of the Client's Site team to, inter alia, monitor archaeological works and facilitate access and monitoring arrangements with key stakeholders.

4.6 Unexpected Finds

4.6.1 If unexpected finds (sites, artefacts, environmental remains or ecofacts, monuments or features) are made during the Pre-construction Activities or Construction Works stages, a site consultation meeting(s) will be convened between the Archaeological Contractor and the Viking CCS Heritage Consultees to consider the significance of the find. Depending on the outcome of the consultation meeting, an addendum to the SSWSI or a new SSWSI will be prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage

Consultees and approved by the relevant local planning authority, advised by their Archaeological Officer.

4.6.2 Prior to the start of the Pre-Construction Activities or Construction Works, procedures will be adopted in the CEMP to ensure that action areas are protected (as provided for by the Draft CEMP [REP4-027] Table 3, draft Mitigation Register (Construction Phase) ref. D2 and D5, as certified by the DCO): this will include areas for archaeological mitigation where work is outstanding. This will involve temporary fencing and clear notices on site fences. Tool Box Talks will be provided by the ACoW and / or the Archaeological Contractor to inform all site personnel of the archaeological and historic environment constraints on Site, the protection measures that are required and their obligations under the DAMS and CEMP and generally to ensure that these are put in place and complied with. The Tool Box Talks will identify sensitive action areas that must not be disturbed until investigation is completed and the site signed-off to construction, or where long-term protection is required. It will be the responsibility of the ACoW to ensure that protection measures are maintained and complied with throughout the construction programme.

4.6.3 The procedure for dealing properly with any unexpected finds during the construction process will be set out in each approved SSWSI and recorded in the CEMP.

4.7 Interruptions and Delays

4.7.1 Archaeological remains and the information that they contain or convey will be treated in an ethical manner, in accordance with current CIfA standards (CIfA, 2022).

4.7.2 The mitigation works will likely extend over different seasons of the year and from time to time it may be necessary to temporarily suspend archaeological work or activities within an action area, in order to preserve archaeological remains or to prevent potential damage until conditions improve (for example, as a consequence of episodes of heavy and persistent rain or prolonged wet weather); or to comply with environmental guidelines for the handling of material such as topsoil as contained within the Contractor's Soil Management Plan; or to comply with animal disease control; or for health & safety reasons. The programming of archaeological mitigation work will take account of the prospect of seasonally poor weather and will minimise activities on site that could be affected by inclement conditions.

4.7.3 Day-to-day decisions regarding working conditions within an action area will fall to the Archaeological Contractor, in consultation with the ACoW. Where extreme conditions arise requiring an immediate decision as to whether work should be suspended for a prolonged (more than 24 hours) period, the Archaeological Contractor will liaise directly with the ACoW and the Contractor (as relevant). The ACoW will be informed which action areas are affected and the reason(s) and likely duration of the interruption and delay, and whether any remedial actions are necessary or are planned (e.g. use of protective shelters or covers to protect exposed archaeological remains during episodes of wet weather, frost etc.). The ACoW will notify the Viking CCS Heritage Consultees regarding the circumstances of prolonged interruptions and delays, and to confirm when the suspended site work has resumed.

4.8 Iterative Site Strategy

4.8.1 Where required, an iterative site strategy for excavation, artefact recovery and for environmental sampling will be agreed with the Archaeological Contractor and the Viking CCS Heritage Consultees (see section 6.1 Communications Strategy, below). As detailed in sections 4.10 and 5.4 of this document (below), it is anticipated that processing of finds and environmental samples, and initial assessment of sampled material, will be carried out concurrent with the archaeological excavations. The site sampling strategy will be determined by the significance of the remains and the requirements of the research objectives set out in the SSWSI.

4.8.2 The Strategy will (where required) be responsive to the works taking place on site. For example, if an action area or site is not answering the expected research questions due to a lack of information, then the extent and scope of works should be reviewed. Similarly, where action areas or sites are producing more environmental evidence than expected a more intensive sampling strategy could be applied than that previously agreed. Unexpected finds (see section ~~Unexpected Finds~~4.6 Unexpected Finds, above) will also be considered. Iterative development of the site strategy will only be undertaken in consultation with the Viking CCS Heritage Consultees at meetings or onsite discussions and changes to the approach detailed in the relevant SSWSI will be approved by the relevant local authority Archaeological Officer. Such changes and approvals will be recorded in weekly progress reports (see section 6.2 of this document): where such changes in approach are considered to be substantive in consultation with the Viking CCS Heritage Consultees the Archaeological Contractor will prepare an addendum to update the relevant existing SSWSI or Method Statement as described in section 4.1 of this document (above).

4.9 Preservation of Archaeological Remains – Protection Measures

Protective Fencing

4.9.1 In order to demarcate action areas that require preservation of archaeological remains and to avoid unintentional damage during construction, temporary fencing will be installed as part of Pre-Construction Activities. The temporary fencing will be installed by the construction contractor under the supervision of the Archaeological Contractor. The location and type of temporary fencing and the procedure and methods for its installation, maintenance and removal will be set out for each action area for preservation of archaeological remains in the relevant SSWSI and, where necessary, in a Method Statement to guide the installation of fencing where this will be undertaken by the construction contractor (it may be helpful for the Archaeological Contractor to combine various sites into a single Method Statement). Notices prohibiting works will be attached to the fencing.

4.9.2 Action areas where intrusive archaeological investigations are planned will also be fenced during Pre-Construction Activities, as required by the programme for those elements of work, in accordance with the procedure and requirements outlined above.

4.9.3 Existing fencing or boundary forms, where present, may be used to protect an action area and the condition and effectiveness of such fencing or boundary forms will need to be checked by the construction contractor to confirm that it is fit for purpose.

4.9.4 The ACoW will be responsible for regularly monitoring the condition of the temporary fencing at sites for preservation of archaeological remains and will ensure that protection measures are maintained and complied with after the Archaeological Contractor has left site, and throughout the construction programme. The ACoW will report any inadvertent incursions or damage to these fenced areas to the Viking CCS Heritage Consultees, including an assessment of the archaeological remains affected and proposals for remedial action. Remedial actions will be agreed with the Viking CCS Heritage Consultees, including archaeological recording of any exposed or damaged remains and, where more extensive remedial action is justified, full excavation of the remains.

4.9.5 The construction contractor will be responsible for the maintenance of the temporary fencing until either construction work in that area is complete or until the end of the Construction Works stage, at which time the removal of the temporary fencing around sites for preservation of archaeological remains will be supervised by the Archaeological Contractor

(or the ACoW if the fencing is to be removed after the Archaeological Contractor has left site).

Track Matting and Protection Beneath Fill Material

4.9.6 Track matting (bog mats) will normally be the preferred approach to ground protection for access routes in areas where archaeological remains are to be retained in place to ensure that buried archaeological remains vulnerable to damage are protected from the effects of plant and vehicle movements and compression (light 4WD vehicles or light duty trucks or normal farm equipment may not require ground protection, depending on ground conditions). Alternatively, ground protection using a suitable barrier membrane with overlying fill on top of the existing topsoil may be appropriate; this is the preferred approach to ground protection where archaeological remains are to be retained in place in temporary construction compounds and laydown, parking and welfare areas.

4.9.7 The selection of the optimum approach for each relevant location will take into account the sensitivity of archaeological remains likely to be present, based on the results of the archaeological evaluation and trial trenching and on data held in the relevant Historic Environment Record (HER). Access routes and temporary construction compounds that have been set up in areas cleared of archaeology in advance and signed-off as part of the programme of archaeological mitigation work, or where the results of archaeological evaluation indicate no archaeological remains are likely to be present, will not require protection.

4.9.8 The construction contractor will describe in a Method Statement the site-specific protective measures, including the extent of the area to be protected (for track matting or fill); and additionally the depth and type of fill and the methodologies for filling areas without disturbing or impacting sensitive archaeological remains (protection beneath fill material). The Method Statement will be developed in line with the principles of Historic England's 'Preserving Archaeological Remains' guidance (Historic England, 2016a) in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer.

4.9.9 Protection measures will be installed by the construction contractor under the supervision of the Archaeological Contractor. The ACoW will be responsible for regularly monitoring their condition. The construction contractor will be responsible for the maintenance of protection measures until either construction work in that area is complete, or at the end of Cconstruction Works, at which time the removal of the measures will be monitored by the Archaeological Contractor (or the ACoW if the protection measures to be removed after the Archaeological Contractor has left site).

4.9.10 Until or unless adequate protection is provided to avoid rutting or the compaction of soft ground vehicles will be ~~restricted or prohibited~~prevented from traversing areas where archaeological remains are to be retained in place and protected using track matting or fill material, through the use of temporary fencing as described above.

4.9.11 The ACoW and /or Archaeological Contractor will give Tool Box Talks to inform all Site personnel of the archaeological and historic environment constraints on Site, the protection measures that are required, and their obligations under the DAMS and CEMP and generally, to ensure that these are put in place and complied with. It is the responsibility of the ACoW to ensure that protection measures are maintained and complied with throughout the construction programme. ~~Following completion of construction at that location, or at the end of Construction Works, the protection will be removed by the construction contractor, leaving the archaeological remains in their original condition.~~

4.10 Archaeological Excavation and Recording – Strip, Map, Sample and Record

General Approach

4.10.1 Archaeological Excavation and Recording (AER) will be the main method to be deployed where the archaeological evaluation results support targeting of defined action areas, such as activity foci, or where the assessed significance of the archaeological remains requires a more detailed excavation strategy to be determined in advance. The general approach for AER will generally follow a strip, map, sample and record process which will also incorporate areas of targeted excavation (aka, 'set piece excavation'), to be completed as part of Pre-Construction Activities, as set out below.

4.10.2 Action areas that require investigation will be those that are identified in Table 3-2 of the DAMS (above), but may also include new areas that arise as a result of ongoing trial trenching, detailed design of the Proposed Development and Unexpected Finds.

4.10.3 Action areas designated for AER will be stripped with mechanical plant as set out in the relevant SSWSI. The sequencing of stripping, location of soil storage areas and arrangements for backfilling, together with other relevant logistical considerations, will be set out in the relevant SSWSI~~in a Method Statement (see section 4.1 of this document, above)~~.

4.10.4 In action areas where machine stripping is required (following completion of any metal detecting, where required under the Strategy), topsoil, subsoil and other overburden will be removed by the Archaeological Contractor to the correct archaeological horizon under archaeological supervision. The relevant horizon will be informed by the evaluation results, the ARA (Archaeological Research Agenda; ~~(~~ see section 2.~~3~~7, above), and the aims and objectives described in the relevant SSWSI.

4.10.5 In accordance with the research aims and objectives outlined in the ~~Archaeological Research Agenda~~ARA and further developed through the identification of site specific aims and objectives within the SSWSI, in consultation with relevant specialists the action area will ~~then~~ initially be subject to hand excavation of key features designed to recover artefactual and scientific dating evidence. All specialist samples will be accurately located in three dimensions and subject to further hand excavation designed to recover artefactual and scientific dating evidence. At the same time selected feature complexes will be subject to further hand excavation designed to resolve stratigraphic relationships. The excavation sampling strategy will follow the approaches set out in paragraphs 4.10.27 to 4.10.48 (below).

4.10.6 The AER works will also include sampling of archaeological remains for palaeoenvironmental and palaeoeconomic indicators (for example, charred plant remains, molluscs, pollen, etc.), in accordance with the relevant SSWSI and the ARA. Artefact and palaeoenvironmental assessments will be carried out during the course of the fieldwork; selected key features/structures will be subject to more detailed excavation and sample recovery to address the evolving research objectives of the archaeological programme. The environmental sampling strategy will follow the approaches set out in paragraphs 4.10.49 to 4.10.59 (below).

4.10.7 The proportion of features excavated will be determined by the significance of the remains and the requirements of the research objectives set out in the SSWSI. This iterative process is intended to allow the approach to excavation sampling to be both flexible and closely targeted to address specific questions, rather than being tied to a pre-determined excavation strategy.

4.10.8 The research objectives and excavation strategy will be kept under review during the investigation of each action area. In order to facilitate this approach, relevant data, artefact and environmental sample processing will be undertaken whilst the fieldwork proceeds (including artefact spot-dating and preliminary assessment of environmental samples). The preliminary assessment of materials, including faunal remains, ecofacts and palaeoenvironmental proxies recovered from samples, undertaken whilst the investigation is underway, will support the outlined iterative approach to sampling.

4.10.9 Decisions on further investigation at a given site will be made once sufficient information becomes available.

4.10.10 Palaeoenvironmental sampling and environmental sequences have the potential to recover information about past human environmental interactions, human activities and evidence of environmental change. Waterlogged deposits or sequences where waterlogged deposits are present within a sequence will receive particular attention. Such deposits may also preserve organic artefacts and textiles which are not ordinarily preserved in dry conditions. Individual SSWSIs will include a detailed strategy for dealing with waterlogged deposits (or other specific artefacts/ecofacts) for those sites where assessment and evaluation has indicated such deposits will, or are likely to be encountered. In the event that waterlogged deposits are identified, the Conservation specialist and the Environmental Archaeology Supervisor will be contacted for advice in the first instance (see section 6.3.61 below), and the Historic England Scientific Advisor will also be contacted.

4.10.11 Geoarchaeological investigations (see section 4.11, below) will focus on areas of particular interest such as the Lincolnshire Outmarsh and pipeline trenchless crossings (see section 3.6, above) and as identified through previous and current archaeological evaluations, the ARA, and will be specifically designed to address particular research questions. The Viking CCS Heritage Consultees and the Historic England Scientific Advisor will be contacted by the Archaeological Contractor and consulted with regard to an appropriate sampling strategy and to comment on site retrieval methods. The sampling methodologies and specific research questions for geoarchaeological investigations will be clearly outlined in the SSWSI.

Machine Excavation

4.10.12 AER will be carried out at the action area(s) identified in the relevant SSWSI. Each action area will be positioned using electronic survey-grade equipment. The initial excavation will be undertaken using a 360° mechanical excavator or other similar back-acting excavator fitted with a toothless bucket, used in such a manner as to expose cleanly the archaeological surface. The Archaeological Contractor shall ensure that plant and plant operators have the capability to achieve a consistently high standard of work. The SSWSI ~~and accompanying Method Statement~~ will include proposals for the stockpiling, handling and replacement of topsoil with reference to the construction contractor's Soil Management Plan, Materials Management Plan, Drainage Strategy and Emergency Response Plan (Draft CEMP, Table 2: ES Volume IV – Appendix 3-1: Draft CEMP. (Document Reference: EN070008/APP/6.4.3.1)[REP4-027]).

4.10.13 Machine excavation will proceed under the direct supervision of the Archaeological Contractor in level spits, until either the top of the first archaeological horizon or undisturbed natural deposits are encountered (the decision to employ spits will be set out in the SSWSI for each excavation site informed by the evaluation results on that site). Particular attention will be paid to achieving a clean and well-defined horizon with the machine. Under no circumstances will the machine be used to cut arbitrary trenches down to natural deposits. The mechanical excavator will not be permitted to traverse any stripped areas.

4.10.14 The surface achieved through machine excavation will be inspected for archaeological remains and will be ~~selectively~~ cleaned as necessary by hand in order to identify or define

the extent of archaeological remains present (particularly important where settlement traces are present, since most evidence of domestic structures will take the form of stake-holes and small post-holes, the successful identification of which is critical). The types of remains that may require hand cleaning will be identified in the SSWSI.

4.10.15 The extent of the area for AER will be clearly demarcated with protective fencing to ensure that persons or vehicles cannot inadvertently traverse the area of investigation whilst archaeological works are in progress (type of fencing to be used will be detailed in the SSWSI ~~MS and in the SSWSI~~). Dump trucks and other plant will not be permitted to track over stripped areas until archaeological investigations at that location are complete and the archaeological action area is signed-off for construction. All fencing/bunds associated with the archaeological works area will be regularly inspected by the ACoW and maintained by the construction contractor until the archaeological works in that area have been completed, inspected and approved (see section 4.8, above).

4.10.16 Topsoil will be subject to a rapid metal detector scan prior to stripping, to identify and recover metal objects within the topsoil. All archaeological metal artefacts (except those that cannot be X-rayed, such as lead artefacts) will be subject to X-ray, which will be used to rapidly scan material for retention or disposal (with reference to the recipient archive storage facility's policies for retention of artefacts and the CIfA selection toolkit). The Finds co-ordinator/processing specialist and the Conservation specialist will be consulted. The archaeological horizon and archaeological features will also be subject to a rapid metal detector scan to identify loose artefacts from uncleaned surfaces, and on cleaned surfaces to help identify areas for careful excavation. Hand-excavated spoil will also be scanned. This will be undertaken by an appropriately qualified or experienced metal detectorist. The SSWSI will set out how metal detecting will be used as part of the artefact recovery strategy within the AER area. Provision will also be made for 3D location recording of artefacts within features, but also within unstratified deposits where significant quantities are identified. The Archaeological Contractor shall consider the use of metal detecting at the end of each day in order to assist in site security.

Hand Excavation

4.10.17 Hand excavation may be employed using hand tools instead of mechanical plant in circumstances where sensitive/fragile archaeological remains are predicted to survive based on the results of trial trenching. These circumstances may include, for example, in situ lithic or other finds assemblages where use of mechanical equipment could result in damage to the fabric or distortion of spatial distributions, or where the scale of the investigations required is significantly smaller or greater control is required (for example, buried ground surfaces).

4.10.18 Hand excavation will be used to establish the presence/absence of remains/artefact distributions, the extent and condition of the remains or concentrations of artefacts, and to inform additional mitigation requirements. It may be necessary to limit the depth of the investigation so as not to compromise the integrity of a high value potential resource, such as a buried ground surface. Hand excavation will be conducted with due regard to the potential survival of cultural material at the interface with the topsoil and the potential survival of microtopographic features, as identified in the SSWSI. It may also be necessary to excavate deposits using spits of pre-determined thickness to allow cross-site comparisons with work undertaken in other action areas or during trial trench evaluation. The proposed use of spits will also be set out in the SSWSI.

Artefact Recovery Strategy

4.10.19 The routine collection of artefacts will be carried out during normal site works, however, other techniques may be deployed as identified in the SSWSI, to recover datasets relevant to the investigation and site specific or wider research objectives.

4.10.20 The Archaeological Contractor will consult with their specialists during the preparation of each SSWSI regarding the artefact recovery strategy. Any changes required during the course of an investigation will be developed as part of the iterative process at site consultation meeting(s) between the Archaeological Contractor, the Viking CCS Heritage Consultees and the Historic England Scientific Advisor.

4.10.21 The artefact recovery strategy may include, for example:

- In situ artefact scatters (for example lithic material or material associated with salt-making or iron smelting: these may come from surface hollows, buried land surfaces, buried shorelines, soils buried beneath earthworks, or within or beneath buried sediments such as colluvial or alluvial deposits which might be present along the Humber wetlands, the Lincolnshire Outmarsh or in river valleys such as the River Ludd/Louth Canal or alongside drains such as Greyfleet Drain, Long Eau, Old engine Drain and Great Eau).
- Bulk sampling for finds (mesh sizes will depend on the material to be recovered, for example, small faunal remains and ecofacts. Consideration will be given in the SSWSI as to how the recovery of multiple materials can be maximised through a single sieving programme).
- Metal detection using a discriminating metal detector in accordance with a scalable strategy (see section 4.13, below). Each SSWSI will set out how metal detection will be used as part of the artefact recovery strategy and will describe the artefact collection and retention policy with reference to the recipient archive storage facility.

4.10.22 All retained artefacts shall be collected, stored and processed in accordance with standard methodologies and national guidelines (see Appendix A) and in line with the requirements of the recipient archive storage facility.

4.10.23 Retained artefacts will be monitored by the project Conservation specialist to minimise further deterioration.

4.10.24 Finds may be recorded three dimensionally depending upon their significance and the value of understanding spatial distributions. Bulk finds (including material collected by bulk wet-sieving) will be collected and recorded by context. Finds may also be recorded according to a pre-determined grid or by spit. The volume of features or specific deposits excavated will be recorded to allow assessment of the density of artefactual material recovered.

4.10.25 The initial care of finds including first-aid and preventive conservation will be in line with current conservation guidelines and standards (including Historic England, 2008b; Historic England, 2010; Historic England, 2018a; and Watkinson & Neal, 2001). A conservation assessment will be undertaken in accordance with Historic England guidance (English Heritage, 2008b), it shall make recommendations for investigative and remedial conservation and shall identify work required to meet the requirements of the recipient archive storage facility. The project Conservation specialist will inform the site team about the potential range of materials, likely condition, ‘first aid’ and preventive conservation treatment measures required.

4.10.26 Metal finds will be X-rayed as part of the post-excavation process in accordance with Historic England published guidelines (Historic England, 2006) to assist in the identification and interpretation of the finds which will contribute to the understanding of an action area (it may also be required to meet the requirements of the recipient archive storage facility). Material will be selected for X-ray by the project Conservation specialist and Finds co-ordinator/processing specialist. Material will not be selected for X-ray where it will not produce informative X-rays e.g. lead alloys, heavily leaded copper alloy, very dense/thick material and obviously modern material (Historic England, 2006).

Excavation Sampling Strategy

4.10.27 Archaeological features, layers or deposits identified for excavation will be hand excavated in an archaeologically controlled and stratigraphic manner, in order to meet the aims and objectives of the investigation as set out in the relevant SSWSI. Machine assisted excavation of large deposits will only be permitted at the discretion of the ACoW and in consultation with the Viking CCS Heritage Consultees.

4.10.28 Sufficient deposits/features will be investigated through hand excavation in each action area in order to record the horizontal and vertical complexity of the stratigraphic sequence to the level of underlying sterile geological strata. Excavation will also target the inter-relationships between features and major feature intersections to understand and record their relationships.

4.10.29 The excavation sampling strategy will be dictated by the significance of the remains, their stratigraphic complexity and their artefactual and palaeoenvironmental content (including absence of artefactual content). The Archaeological Contractor, in consultation with the Viking CCS Heritage Consultees, will describe in their SSWSI an appropriate sampling strategy as determined by the results of the archaeological evaluation and key research questions, for approval by the relevant local authority Archaeological Officer, prior to works commencing in the action area.

4.10.30 The strategy will be kept under review during the investigation. Site data, artefact and environmental sample processing will be undertaken whilst the investigation proceeds on site (including artefact spot-dating and preliminary assessment of environmental samples). Initially, the minimum sample sizes (see below) will be implemented on site by the Archaeological Contractor in accordance with the approved SSWSI. Changes to the strategy will be developed as an iterative process at site consultation meeting(s) (see section 4.7, above).

4.10.31 The following minimum sampling requirements will be used as a standard, these may be varied within the iterative excavation sampling strategy to suit the research value of the remains. The SSWSI will identify the initial minimum sample for excavation.

Linear features

4.10.32 Sufficient sections through linear features will be targeted in key locations to address research questions. It may be necessary to increase percentage excavation to address research questions where a higher volume sample would achieve this. Segments will be hand excavated along the length of the feature to understand its depositional sequence and character. Each segment will be not less than 1m long and will be regularly spaced along its length. Segments will be located away from intersections with other features, although key intersections will also be targeted to provide an understanding of the deposit sequence and the relationship between different feature types/classes. All ditch ends will be investigated.

4.10.33 A minimum of 20% of each linear feature will be excavated (increasing to 40% for enclosure ditches and 100% for smaller curvilinear features).

Discrete features

4.10.34 Pits, post-holes and other isolated features (including natural features that have been shown to contain archaeological remains) will be completely (100%) excavated (unless otherwise agreed in consultation with the Viking CCS Heritage Consultees).

Buried ground surfaces, floor surfaces, hearths

4.10.35 Buried ground surfaces, floor surfaces and hearths have the potential to contain important remains, including finds distributions, ecofacts and palaeoenvironmental remains. It may be

possible to recognise individual turves or deposits representing dumped material: if laminated sequences are identified e.g. turves, the project Geoarchaeologist will attend site with the Environmental archaeology supervisor to devise a sampling strategy, which may include recovery of monoliths. Grid sampling and bulk sampling may be adopted depending upon the significance of the remains and the research questions identified in each SSWSI. Hearths and areas of in situ burning will be completely excavated (in plan or by quadrant) and sampled for palaeoenvironmental remains and to recover material suitable for scientific dating, such as archaeomagnetic dating, to address key research aims.

Animal bone groups or other structured deposits

4.10.36 If structured deposits or animal bone groups are identified during excavation, the Archaeological Contractor will follow Historic England guidance 'Animal bones and Archaeology: Recovery to archive' (Historic England, 2019a) and will consult with the Viking CCS Heritage Consultees and the Historic England Scientific Advisor in determining the sample size to be excavated.

Structures

4.10.37 Each structure, including stone structures, will be investigated/sampled to define the extent, form, stratigraphic complexity and depth of the component features and its associated deposits. Intersections between components will be investigated to determine their relationship(s). Particular care will be taken to ensure that areas of in situ burning are not investigated prior to the consideration of scientific dating. Careful hand cleaning may be required at the level of definition to establish the full extent of the structure and any associated or related contemporary features, in order to understand its complexity, state of preservation, significance and to contribute to answering research questions set out in the SSWSI.

4.10.38 The excavation of wells or similar deep structures will only proceed following a safe working practice, as required by national health & safety guidance and as recorded in the Risk Assessment Method Statement to be prepared by the Archaeological Contractor. Preliminary hand augering of potential deep deposits may be able to identify their depth and inform an excavation strategy, which may include machine excavation or stepped excavation.

Burials

4.10.39 In the event of the discovery of human remains the Archaeological Contractor will notify the ACoW and the Principal Contractor immediately, and the ACoW will notify the Police and the Viking CCS Heritage Consultees, in accordance with Part 4 clause 21 of the Order and removal will proceed in accordance with a licence from the Ministry of Justice and under the appropriate Environmental Health regulations and the Burial Act 1857.

4.10.40 All human remains will be treated with dignity and respect. Remains will be covered and protected and left in situ in the first instance, in accordance with current good practice and the human remains specialist will visit the action area to provide specialist advice and to ensure that the work is being conducted in accordance with the procedures set out in the SSWSI.

4.10.41 The SSWSI will describe a strategy for the investigation, treatment, recovery and assessment/analysis of human remains (neonate/young infants, inhumations, cremations, disarticulated/charnel remains).

4.10.42 The excavation of human remains will be undertaken in accordance with national guidelines (Historic England, 2018b; APABE, 2017; Historic England, 2013; and McKinley and Roberts, 1993), under the guidance of the Human Remains specialist. If scattered cremated remains are present, for example in subsoil or colluvium, it may be necessary to use a combination

of methodologies and techniques (including sample sieving) to identify the source of the deposit. The excavation of mortuary-related remains may be suspended pending consultation with the Viking CCS Heritage Consultees.

4.10.43 In general, excavation of human remains will not extend beyond the limits of the action area; however, it may be followed under the baulk (excavation limits) so that it may be lifted in its entirety, provided this will not result in disturbance of further burials or extend beyond the Order Limits. In situations where preservation of archaeological remains is desirable then a preservation strategy will be agreed on a case by case basis in consultation with the Viking CCS Heritage Consultees.

Recording

4.10.44 Once open, the extent of the action area(s) will be accurately recorded using metric survey-grade equipment (or its equivalent) and fixed in relation to any existing survey markers. The data will be overlaid onto the Ordnance Survey national grid (using digital map data).

4.10.45 Following cleaning, the archaeological remains will be mapped (electronic survey-grade equipment) and planned to enable the selection of areas and features for investigation in accordance with the excavation sampling strategy set out 4.10.27-43 and to compare the position of the identified archaeological remains with any available previous geophysical, aerial photographic, trial trench data, as applicable.

4.10.46 A full written, drawn and photographic record will be made of the archaeological remains, in accordance with the Archaeological Contractor's recording system and standard archaeological methodologies (Appendix A).

4.10.47 Hand-drawn plans and sections of features will be produced. The minimum acceptable scale will be 1:50 or 1:20 for plans and 1:10 for sections. Human burials and other special deposits, such as animal bone groups will normally be drawn at a scale of 1:10 or 1:5. All plans and sections will be accurately located against the site grid using electronic survey equipment and will include spot heights relative to Ordnance Datum in metres and will be expressed to a minimum of two decimal places. The Archaeological Contractor will include in their SSWSI a statement that describes their recording system and the accuracy of their site mapping.

4.10.48 Site photography will be used to record all archaeological remains that are under investigation. In addition, photographs will be taken to assist in interpretation and publication, and to give an overview of the site, the progress of the investigations and site activities. Overhead (drone) photography will also be used to record progress, relationships between structures and to put the investigations within a wider landscape context. Particular attention will be paid to obtaining photographs suitable for displays, exhibitions and other publicity material. It is anticipated that industry minimum and good practice standard for digital photography will apply (see Appendix A).

Environmental Sampling Strategy

4.10.49 The Archaeological Contractor will include in the SSWSI a strategy for environmental sampling, based upon the results of previous assessment work and the potential of an action area(s) to address key research questions. The strategy will be informed through consultation with all relevant key specialists, including the Environmental archaeology supervisor and the named Environmental archaeological specialist who will oversee the work during fieldwork to ensure the smooth running of this aspect of the investigations.

4.10.50 The Environmental archaeology supervisor and the named Environmental archaeological specialist will be present at site visits and meetings with the Viking CCS Heritage Consultees and Historic England as necessary, and shall also take charge of the routine processing of samples and the supervision of routine sampling in connection with the investigations.

4.10.51 Environmental sampling will be carried out in accordance with current national guidelines including Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-Excavation (Historic England, 2011), Geoarchaeology, Using earth sciences to understand the archaeological record (Historic England, 2015b), Deposit modelling and archaeology: guidance for mapping buried deposits (Historic England, 2020); and the current CIfA Standard and guidance for the collection, documentation, conservation and research of archaeological materials (CIfA, 2020a). Other relevant guidance is contained within Appendix A.

4.10.52 It is anticipated that processing of environmental samples and initial assessment of sampled material will be carried out concurrent with the archaeological excavations. The arrangements for processing and initial assessment of all samples shall enable emerging results to be feed back to the field team and into the sampling strategy. Processing will be supervised by the Archaeological Contractor's Finds co-ordinator/processing specialist.

4.10.53 Finds, ecofacts and biological artefacts from sample residues should be recorded to sample fraction.

4.10.54 The aims of the environmental strategy will be to address the ARA. Site based studies that could aid the investigations may include the following (this list is not exhaustive and other studies may be relevant):

- Pedological (including micromorphology) study of soils (or other suitable deposits) deeply buried beneath or within colluvium would provide information relating to the status of the soil at the time of burial and should be able to detect and characterise aspects of previous land use and provide information on erosion and on the contribution of colluvium and wind-borne material to the soil.
- Pollen and diatom/phytolith analysis.
- Detailed wet sieving/flotation of buried ground surfaces and other selected contexts and features for the recovery of charcoal/wood, plant macrofossils, small animal bones, molluscs, coleoptera, small artefacts etc. The retrieval of a reliable sample can be achieved by the routine sampling of a set proportion of each selected context/deposit excavated. Sampling should be systematic and extensive.

4.10.55 The results from the investigations should be assessed in relation to discoveries from the wider landscape where this is relevant to an understanding of an action area(s).

4.10.56 If significant archaeological remains/geoarchaeological deposits are encountered during the investigations (for example organic rich remains or deeply stratified sediments), the Environmental archaeology supervisor and Geoarchaeologist will be contacted for advice and to devise an appropriate strategy for excavation and sampling. The Viking CCS Heritage Consultees and the Historic England Scientific Advisor will be contacted by the Archaeological Contractor and consulted with regard to an appropriate sampling strategy and to comment on site retrieval methods.

4.10.57 All samples taken will come from suitably cleaned surfaces and will be collected with clean tools and placed in clean containers, in consultation with the relevant project specialists. They will be recorded and labelled in accordance with national guidelines and the requirements of the recipient archive storage facility, and a register of all samples will be kept. Once the samples have been obtained, the Environmental archaeology supervisor and the Finds co-ordinator will ensure that they are placed in safe storage under suitable conditions to prevent deterioration prior to them being sent to the appropriate project specialist for examination.

4.10.58 Environmental assessment to be carried out at the post-excavation reporting stages may include consideration of scientific methodologies alongside traditional recording. The

Archaeological Contractor will consult with the Viking CCS Heritage Consultees and Historic England for further advice prior to analysis being undertaken; the ACoW will approve the proposals for scientific study to be carried out at the post-excavation reporting stages.

4.10.59 Samples for radiocarbon dating will be identified from material sampled for environmental analyses (see Strategy for Scientific Dating below).

Strategy for Scientific Dating

4.10.60 The Archaeological Contractor will include in the SSWSI a strategy for scientific dating to ensure that a comprehensive scientific dating programme is combined with the archaeological evidence to address the Archaeological Research Agenda at the post-excavation reporting stages. The strategy will be informed through consultation with all relevant key specialists, including the project Scientific dating specialist and the ~~Historic England Scientific Advisor~~Viking CCS Heritage Consultees.

4.10.61 The Scientific dating specialist will also provide advice and guidance throughout the project, including preparation of the strategy, field investigations and at the post-excavation reporting stages, to ensure the smooth running of this aspect of the work, in consultation with the Historic England Scientific Advisor.

4.10.62 The Scientific dating specialist shall take charge of the routine processing of samples.

4.10.63 Although scientific dating will be undertaken at the post-excavation stage, it may also be prioritised during fieldwork to inform decision making and develop the strategies used on site.

4.10.64 Samples for radiocarbon dating will be identified from materials sampled for environmental analyses (see Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-Excavation (Historic England, 2011), Geoarchaeology, Using earth sciences to understand the archaeological record (Historic England, 2015b), and Animal Bones and Archaeology – Recovery to archive (Historic England, 2019a) or from recovered artefacts (refer to Artefact Recovery Strategy, above). The requirements for the recovery, processing, and retention of these materials may be affected by the proposed dating programme (e.g. packaging typologically diagnostic refitting groups of ceramic sherds so that their potential for absorbed lipid analysis and dating is not compromised).

4.10.65 Scientific dating may also be utilised to provide spot dates to inform the excavation strategy, contribute to understanding of stratigraphic sequences, or to provide precision/resolution for statistical modelling.

4.10.66 Scientific dating techniques may include the following:

- Radiocarbon (14C) dating which can be used to date any carbon-based organic materials, such as wood, bone, plant remains;
- Luminescence dating (optically stimulated luminescence or OSL) which may be suitable for lynchets and linear ditches;
- Archaeomagnetic dating for highly fired structures such as kilns or ovens and burnt soil;
- A range of other absolute techniques, such as amino acid racemization, tephrachronology (dating volcanic ash from deposits);
- If preserved wood is present, for example, in waterlogged deposits then dendrochronology may be able to provide precise and accurate dates.

4.10.67 Scientific dating will be undertaken on the recovered samples in accordance with an explicit sampling strategy that incorporates chronological modelling to address the research questions set out in the Archaeological Research Agenda and the SSWSI (Bayliss and

Marshall, 2022). Multiple laboratories/techniques will be employed to ensure that robust chronologies are produced. Different strands of evidence will be combined using formal statistical modelling to produce quantitative estimates for chronologies that address the project objectives. Reporting will follow Historic England guidelines (ibid).

Treasure

4.10.68 Artefacts that fall within the scope of the Treasure Act (1996) and the Treasure Designation (Amendment) Order 2023 will be immediately reported to the ACoW and the Principal Contractor. The ACoW will contact H.M. Coroner and will ensure that the Treasure regulations are enforced and that all parties are kept informed. The Lincolnshire Finds Liaison Officer for the Portable Antiquities Scheme and the Viking CCS Heritage Consultees will also be notified immediately. A list of finds that have been collected that fall under the Treasure Act and related legislation will be included in the fieldwork report.

4.11 Targeted Archaeological Monitoring and Recording (AMR)

General approach

4.11.1 Areas for targeted Archaeological Monitoring and Recording (AMR) will be defined following completion of trial trenching and Figures 1 and 2 will be updated accordingly. The following general approach will apply for Targeted Archaeological Monitoring and Recording (TAMR) during Pre-Construction Activities and Construction Works.

4.11.2 Targeted archaeological monitoring will be undertaken in areas where prior archaeological evaluation indicates this approach is appropriate, and/or in areas where archaeological investigation and recording in advance of construction are not feasible due to safety or logistical considerations, or undesirable due to environmental or engineering constraints. The construction contractor's preferred method of working would be controlled as necessary by the supervising archaeologist to allow archaeological recording to take place to the required standard (as provided for by the Draft CEMP [REP4-027] Table 3, draft Mitigation Register (Construction Phase) ref. D3, as certified by the DCO).

4.11.3 In the event of human remains being found during the course of archaeological monitoring of construction works, works should stop, the local coroner, Project Manager and County Archaeologist (or equivalent) should be notified immediately. The local area around the remains should be immediately isolated and protected by the construction contractor. Work in this area should not recommence without the prior acceptance of the Project Manager and a Ministry of Justice (exhumation) licence being in place prior to their removal (as provided for by the Draft CEMP [REP4-027] Table 3, draft Mitigation Register (Construction Phase) ref. D4, as certified by the DCO).

4.11.4 If archaeological finds are discovered during archaeological monitoring of construction works, works in the relevant area should stop, the Applicant's Project Manager will be informed, and appropriate steps undertaken, in consultation with the County Archaeologist (or equivalent), to excavate and record the finds prior to construction works continuing (as provided for by the Draft CEMP [REP4-027] Table 3, draft Mitigation Register (Construction Phase) ref. D5, as certified by the DCO).

Generic Methodology

4.11.5 Action areas that require targeted ~~T~~AMR during construction activities and investigation will be those that are identified in Table 3-2 of the DAMS (above), but may also include new areas that arise as a result of emerging results, detailed design and Unexpected Finds (see section 4.5 of this document). Targeted AMR will be required during stripping, and may also

be required during excavation of the pipeline trench (dependent on assessment and evaluation results and the working methods adopted for excavation of the pipe trench).

4.11.6 Action areas designated fortargeted ~~T~~AMR will be stripped by the construction contractor with mechanical plant (bulldozers must not be used to strip areas designated for TAMR) as set out in the SSWSI. The construction contractor's preferred method of working will be subject to archaeological supervision and control. Topsoil, subsoil or other overburden that does not contain datasets relevant to the research objectives (as set out for each action area) will be stripped by a mechanical excavator fitted with a toothless bucket to the correct archaeological horizon, under the supervision of the Archaeological Contractor. The relevant horizon will be informed by the evaluation results, the Archaeological Research Agenda and the research aims and objectives identified in the SSWSI. The sequencing of stripping together with other relevant logistical considerations will be set out in a Method Statement to be prepared by the Archaeological Contractor.

4.11.7 Following stripping, if archaeological remains are identified they will be surveyed using electronic survey-grade equipment to create a detailed digital pre-excavation plan. In accordance with the Archaeological Research Agenda and the aims and objectives that will be identified in each SSWSI, a strategy based on this plan will be implemented for hand excavation of key features to recover artefactual and scientific dating evidence. At the same time selected feature complexes will be subject to further hand excavation designed to resolve stratigraphic relationships.

4.11.8 The proportion of features excavated will be determined by the significance of the remains, the Archaeological Research Agenda and the research aims and objectives set out in the SSWSI. The ACoW in consultation with the construction contractor and the Viking CCS Heritage Consultees, will determine the scope of work and timetable for the completion of the investigation at each action area and access parameters for plant (once the parameters have been established, access for plant will be controlled pro-actively by the Archaeological Contractor). Plant and vehicles would not be permitted to track over areas that contain remains until archaeological investigations are complete, or until the ACoW has given permission.

4.11.9 The Archaeological Contractor may need to deploy additional resources in order to record the remains to a proper standard. The construction contractor will allow sufficient time for the investigation of the archaeological remains

4.11.10 Modification of the works specification may be required during the investigations to enable detailed recording to take place, and to allow adequate time within the construction programme in the event of important discoveries. In this situation a revised SSWSI will be prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees, prior to works commencing in the area to which the SSWSI applies.

Unexpected Finds

4.11.11 In the event of Unexpected Finds requiring further investigation (that is, a significant find that was not predicted as a result of the evaluation), the provisions set out at section 4.5 of this document will apply. The area will be fenced off, cleaned archaeologically, and recording works completed, in line with a revised SSWSI prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer.

4.12 Geoarchaeological and Palaeoenvironmental Investigations

General Approach

4.12.1 Geoarchaeological investigation is a programme of sample recovery and analysis undertaken to investigate the formation of the palaeoenvironmental conditions and soil sediment development that may be relevant to the research of archaeological remains recovered within an action area or within its vicinity. While geoarchaeological investigations were included as a methodology in the WSI for evaluation surveys (ES Volume IV – Appendix 8-3: WSI for Archaeological Evaluation (Document Reference: EN070008/APP/6.4.8.3) [REP2-016/017] and subsequently applied in tandem with geotechnical investigations, the following general approach and generic methodology are included here for completeness.

4.12.2 Geoarchaeological methods used will be employed as part of the overall site mitigation strategy where high potential for remains requires such an approach. The approach may involve hand excavated holes (trial trenches/test pits) or mechanically excavated holes and /or other geotechnical soil sample retrieval methods (such as auger or borehole) and will be undertaken at specific locations identified within the SSWSI.

4.12.3 The project Geoarchaeologist will be on site during all geoarchaeological investigations and will also be available during AER and TAMR and at the reporting phase to provide advice and guidance to the rest of the fieldwork team, and to ensure that the scientific sampling/recovery is being carried out in accordance with the requirements and procedures set out in the SSWSI.

Generic Methodology

4.12.4 Geoarchaeological investigations during Pre-Construction Activities and Construction Works will be carried out in accordance with the Archaeological Contractor's geoarchaeology strategy, which will be devised with clear overarching research questions by the project Geoarchaeologist (and all other relevant project specialists) in consultation with the Viking CCS Heritage Consultees and the Historic England Scientific Advisor, prior to the start of the mitigation programme. The Geoarchaeologist will oversee the work during fieldwork and liaise with other specialists who may be involved to develop fully the strategy for environmental research and ensure the smooth running of this aspect of the investigations.

4.12.5 Action areas that require geoarchaeological investigation will be those that are identified through previous and current archaeological evaluations and geoarchaeological investigations as of particular interest, or as a result of unexpected discoveries.

4.12.6 Geoarchaeological investigations (trenches, test pits, auger or boreholes) of specified types/size but large enough to provide a safe working environment for investigative works will be excavated at the location(s) identified in the SSWSI, which shall also cross-reference to the environmental sampling strategy.

4.12.7 Geoarchaeological investigations may be excavated in level spits to undisturbed natural deposits. Larger interventions may be stepped to ensure stability and safety. Natural deposits will be exposed to a sufficient depth in order to prove their geological origin. Particular attention will be paid to ensure that areas of alluvium, colluvium, river gravels and sand deposits, where they are encountered, are sufficiently tested to ensure that buried peat horizons and palaeoenvironmentally rich palaeochannels are located where/if present. Augering may be used to investigate buried deposits. If significant archaeological remains are encountered during the investigations, the Geoarchaeologist will devise an appropriate

strategy for excavation and sampling. The Archaeological Contractor will inform the ACoW immediately, who will then notify the construction contractor.

4.12.8 Sections will be cleaned by hand in order to fully reveal the full stratigraphic sequence and to prepare sections for environmental sampling, such as soil columns. The full geo-archaeological sequence will be investigated to identify and understand the formation processes to address the Archaeological Research Agenda and the site-specific research objectives developed in the SSWSI.

4.12.9 Palaeoenvironmental sequences will be sampled for the broad range of evidence that they may contain including micro-morphology, charred plant remains, plant macrofossils, pollen, wood, invertebrates and molluscs. Particular samples will also be directed at identifying key components for scientific dating.

4.12.10 If column samples are taken, their location will be accurately surveyed using electronic surveying equipment and their location drawn on the accompanying section drawing.

Auger/Boreholes

4.12.11 Throughout the mitigation programme augering may be required to establish how far deposits extend below the surface, the character of buried deposits and to confirm that a deposit does not seal other archaeological deposits. Hand/power augers (e.g. window sample or other shallow borehole equipment) may be used to log/describe deposit sequences and to collect samples, where this is the most suitable methodology to address clear research questions. Augering may be undertaken as part of archaeological or geoarchaeology investigations, where it will be employed under the guidance of the Environmental archaeology specialist and /or the Geoarchaeologist. The requirement for hand or power augering will be set out in the SSWSI and Method Statement prepared by the Archaeological Contractor, in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer.

Recording

4.12.12 The location and extent of each geoarchaeological investigation will be accurately recorded using metric survey-grade equipment and fixed in relation to existing survey markers. The data will be overlaid onto the Ordnance Survey national grid (using digital map data).

4.12.13 Prior to the drafting of each SSWSI, the Geoarchaeologist will review the geology and soil descriptions and the results of previous ground investigations and archaeological evaluation. The Geoarchaeologist will also prepare a site-specific deposit model if in their opinion it would result in a better understanding of the sequence and to inform the decision-making process (Carey et al., 2018).

4.12.14 A full written, drawn and photographic record will be made of each geoarchaeological investigation action area even where no archaeological deposits are identified. Cores may be recorded on pro-forma logs. Hand drawn sections (and plans where relevant) of the deposit sequence will be produced at an appropriate scale (normally 1:20 for plans and 1:10 for sections). All plans and sections will include spot heights relative to Ordnance Datum in metres, correct to two decimal places.

4.12.15 Photographs will be taken during the course of the geoarchaeology investigations to record site activities, the deposit sequence and sample locations.

4.12.16 The same methodologies for archaeological excavation and recording will apply (artefact recovery, human remains, treasure etc) to geoarchaeology investigations.

4.13 Trial Trenching/Test Pitting

General Approach

4.13.1 During Pre-Construction Activities, trial trenching will be carried out in areas along the Proposed Development where evaluation surveys were not completed due to access issues, or where only a limited amount of survey work was undertaken. The purpose of the additional trial trenching will be to determine the presence/absence, extent, character, condition and significance of the remains in order to inform the detailed mitigation requirements at these locations should it be required.

4.13.2 The approach to be employed will follow the approved WSI for Archaeological Evaluation (ES Volume IV – Appendix 8-3: WSI for Archaeological Evaluation (Document Reference: EN070008/APP/6.4.8.3) [REP2-016/017]), but shall take into account specific provisions of the Strategy in respect of archaeological excavation and recording, where relevant (see section 4.9 of this document).

~~4.13.2~~ Following completion of any trial trenching / test pitting during Pre-Construction Activities, the results will be reported in sufficient time to allow for consultation with the Viking CCS Heritage Consultees. The results will be assessed and the Strategy will be updated as appropriate. The results of the completed trial trenching will inform the preparation of the SSWSIs for mitigation.

4.14 Metal Detecting

General Approach

4.14.1 While metal detecting was included as a methodology in the WSI for evaluation surveys (ES Volume IV – Appendix 8-3: WSI for Archaeological Evaluation (Document Reference: EN070008/APP/6.4.8.3) [REP2-016/017], the following general approach and generic methodology are included here for completeness.

4.14.2 Metal detecting, the identification and recording of surface and buried metal artefacts, will be undertaken to recover metalwork that is within the ploughzone, either from the topsoil prior to excavation, or from archaeological horizons during machine stripping. It will be carried out in accordance with a scalable strategy to ensure a targeted approach to the survey. Metal detecting may be completed prior to the commencement of other forms of intrusive archaeological mitigation or as part of excavation within an action area. (Metal detecting may also be deployed as part of the normal excavation procedure to enhance artefact recovery during hand excavation of archaeological remains, and over spoil heaps to assess the level of recovery).

Generic Methodology

4.14.3 Metal detecting will be deployed where there is a requirement to assess the archaeological potential of an action area and/or where the assessed significance of an identified spread of artefacts requires a more detailed investigation. A single action area for metal detecting as part of the archaeological evaluation was identified north of Barnoldby le Beck surveys to assess the presence/absence of archaeological remains that could be associated with a scheduled Civil War fort northeast of Walk Farm [303] and evidence of Anglo-Saxon burial activity at Welbeck Hill [223, 224] (ES Volume IV – Appendix 8-3: WSI for Archaeological Evaluation (Document Reference: EN070008/APP/6.4.8.3) [REP2-016/017]).

4.14.4 The scaleable (2-stage) strategy for metal detecting within the ploughzone will comprise an initial non-intensive survey to determine the character and extent of the metalwork comprising two baselines orthogonal to each other survey and transects at 10m spacing (recommendations from the Battlefields Trust; see Marsh, 2023: p.12).

4.14.5 Depending upon the results of the initial non-intensive survey, finds distributions that are considered to be significant (as determined by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees) will be further investigated by intensive survey, achieved by reducing the spacing between the survey transects to 2m spacing over the identified hot spots.

4.14.6 The scope and location of the metal detecting survey will be described in a SSWSI to be prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees and approved by the relevant local authority Archaeological Officer.

4.14.7 Metal detecting will only be undertaken by experienced metal detectorists who shall be aware of the Code of Practice for Responsible Metal Detecting in England and Wales (https://finds.org.uk/getinvolved/guides/codeofpractice). Modern metal detection equipment shall be used, and the survey will be undertaken in 'all metal mode' (sensitivity settings to be used shall be guided by experienced detectorists familiar with the detection equipment).

4.14.8 The Archaeological Contractor shall appoint a Metal Detectorist co-ordinator, who will have the necessary archaeological experience and expertise to ensure the best results from metal detector operators in the field and the efficient reporting of the results. The co-ordinator shall be responsible for maintaining a register of metal detector users involved in the survey(s), providing appropriate site access and for ensuring good practice in survey and recording methodology. The co-ordinator will also ensure that appropriate arrangements are made for the identification, conservation and security of the finds and ultimately their incorporation into the overall project finds database.

4.14.9 External metal detectorists engaged by the Archaeological Contractor must agree to abide by the relevant Policies, Methods/Guidelines and Agreements of the Archaeological Contractor prior to deployment to site. In these circumstances the metal detectorist co-ordinator shall ensure that the work is regulated by formal written agreements between the Archaeological Contractor and the nominated detectorists to ensure that all work is carried out in accordance with a set of principles agreed at the outset of the project and detailed in the SSWSI. The Metal Detectorist co-ordinator shall also ensure that all detectorists are fully briefed to ensure that they adhere to the principles set out in their written agreement and have completed all health and safety inductions and training necessary to work on the site.

4.14.10 The Archaeological Contractor shall confirm in the SSWSI how finds distributions will be recorded (located, recovered and bagged) and the finds disposal policy for modern objects such as food and drink waste, modern agricultural debris.

4.14.11 Additionally, the Archaeological Contractor shall also describe how night-hawking activities will be deterred and whether mitigation measures are appropriate to counter the threat of illicit metal detecting activities.

4.14.12 Prior to the start of initial non-intensive metal detection survey the Archaeological Contractor shall assess the soil chemistry of the ploughzone to confirm the potential for the survival of metal artefacts (especially ferrous artefacts).

4.14.13 All recovered metal objects will be quickly assessed and identified by an appropriate specialist to inform the strategy and will be conserved in accordance with the Archaeological Contractor's finds policy (objects may also require x-ray to confirm their identification (Historic England, 2006)). The artefacts shall be included on the project finds database.

4.14.14 Results from metal detecting shall be presented in a specialist technical report(s) prepared by the Archaeological Contractor (see section 7, below). The aim of assessment/ analysis will be to maximise the potential of the record to understand the archaeological resource overall as part of the Strategy and to understand spatial distribution of the artefacts within the ploughzone generally and in relation to other influencing factors (including land use and

agricultural practice, taphonomic processes, topography, geology and relationship to other archaeological and natural features, etc.).

4.14.15 Interim statements will also be produced by the Archaeological Contractor immediately upon completion of a stage of fieldwork to inform the metal detecting strategy (briefly summarising the findings and containing recommendations for extending a survey or to advance to intensive metal-detecting).

4.15 Archaeological Topographic Survey (Earthwork Survey)

General Approach

4.15.1 Archaeological topographic survey (earthwork survey) was included as a methodology in the WSI for evaluation surveys (ES Volume IV – Appendix 8-3: WSI for Archaeological Evaluation (Document Reference: EN070008/APP/6.4.8.3) [REP2-016/017]. As part of Pre-Construction Activities, archaeological topographic survey will be carried out in areas along the Proposed Development where evaluation surveys were not completed due to access issues, or where only a limited amount of survey work was undertaken. The purpose of the archaeological topographic survey will be to record earthwork features that cannot be avoided, and which will be impacted by the Proposed Development.

4.15.2 The scope and location of any additional archaeological topographic survey, where required, will be described in each SSWSI that will be prepared by the Archaeological Contractor in consultation with the Viking CCS Heritage Consultees, and approved by the relevant local authority Archaeological Officer. The approach to be employed for archaeological topographic survey will be identical to that set out for earthwork survey in the approved WSI for Archaeological Evaluation (ES Volume IV – Appendix 8-3: WSI for Archaeological Evaluation (Document Reference: EN070008/APP/6.4.8.3) [REP2-016/017]).

4.16 Strategy for Digital Data

4.16.1 The Archaeological Contractor will preserve and make accessible to future generations digital material produced during the course of the project, regardless of the media on which the information is stored. Examples of digital material that will be generated include complex datasets from the fieldwork, post-excavation reporting stages, which will be curated into a digital archive (e.g. topographic survey, trench evaluation, mitigation investigations, GIS, CAD and relational databases, photography, illustrations, specialist studies).

4.16.2 The project Digital data co-ordinator will be responsible for the creation of the digital archive and will ensure that data collection conforms to the requirements of the digital archive. The Digital data co-ordinator will be available throughout the life cycle of the project to provide advice to other members of the team on the format, structure and content of the digital archive, and at the end of the project they will ensure that the digital archive is transferred to the digital repository.

4.16.3 Existing and new digital data will be safeguarded and deposited in a digital archive, such as the Archaeology Data Service, that conforms to current national standards and guidelines on how data will be structured, preserved and accessed (including CIfA, 2020b; Brown, 2011; Historic England, 2012; and ADS, 2011) and Historic England guidance on Digital Archiving, ‘Work Digital / Think Archive: A guide to managing digital data generated from archaeological investigations’ (Historic England, 2019b).

4.16.4 The Archaeological Contractor will arrange for the digital archive to be stored in a suitable facility or collections repository where it can be properly accessed, curated and maintained. The Archaeological Contractor will consult with the Viking CCS Heritage Consultees and the ACoW if the digital archive will be held in a location separate to the written/drawn records that comprise the traditional project archive.

4.16.5 The Archaeological Contractor will ensure thorough documentation of the digital datasets, including details on how it was collected, what standards were used to describe them and how they are being managed. Some data may be confidential and a means of separating this data from non-confidential data will be developed for reports, analytical datasets, and for displaying site locations on maps. It is important that this process is documented and deposited as part of the digital archive.

4.16.6 Interim/temporary versions of final digital files will not generally be preserved except where data or text is subsequently discarded or lost before it is finalised. Data held safely on paper records will be digitised where there is specific value in doing so, and/or to provide a digital security copy or online access to the data. Paper originals will be retained within the traditional project archive.

4.16.7 Irrespective of whether the paper and digital archive is stored in separate places, the overall integrity of the complete archive will be ensured by the cross-referencing between the physical collections and digital records.

4.16.8 As a minimum the digital archive will contain an index to the archaeological interventions, finds and the written/drawn archive, and will provide access to digital records of data, material documentation, interpretation and analyses.

4.16.9 The Archaeological Contractor shall plan for the digital archive at the start of the investigations and throughout the project lifecycle, in accordance with the Archaeology Data Service/Digital Antiquity Guides to Good Practice (ADS, 2011).

Digital Data Management Plan

The Archaeological Contractor shall prepare a Digital Data Management Plan (DDMP) based on the above considerations, with reference to the Digital Curation Centre's Checklist for a Data Management Plan (DCC, 2013) setting out proposals for the creation, collection, processing and preservation of digital data sets.

5 Programme

5.1 Introduction

5.1.1 Archaeological mitigation will commence as part of the Pre-construction Activities stage and will be scheduled to be completed before the start of the Construction Works stage, except specific works (for example, targeted Archaeological Monitoring and Recording) that will necessarily only take place at the Construction Works stage.

5.1.2 The Public Archaeology and Community Engagement Programme will be implemented throughout the Pre-construction and Construction Works stages.

~~5.1.2~~5.1.3 An outline programme for the archaeological works will be included in the final DAMS.

5.2 Archaeological Investigation During Pre-construction Activities

5.2.1 The mitigation programme is dependent upon land access requirements, prevailing ground conditions and related utility diversions. Archaeological works will be generally programmed as follows at Phase 1:

- Archaeological Topographic Survey (earthwork survey) where it was not possible to complete this before the start of Examination (see section 4.14 of this document);
- Metal Detection within the ploughzone (see section 4.13 of this document);
- Archaeological evaluation trial trenching, where it was not possible to complete this before submission of the Strategy (see section 4.12 of this document);
- Small-scale investigation of historic landscape features and other small-scale action areas;
- Geoarchaeology investigations (see section 4.11 of this document). Existing models from evaluation and new data collected during fieldwork will be used to model deposit sequences as part of the on-site iterative process, during the Pre-construction Activities stage;
- Archaeological excavation and recording (strip, map, sample and record) will be undertaken during the Pre-construction Activities stage (prior to construction) at archaeological action areas requiring preservation by record (see section 4.9 of this document);
- Temporary, protective fencing will be installed around identified action areas to prevent damage (see section 4.8 of this document); and
- Additional action areas that require preservation of archaeological remains will be identified and measures implemented (see section 4.8 of this document).

5.2.2 Archaeological works compounds, including on-site archaeological processing and other post-excavation facilities will be established during the course of the Pre-construction Activities stage. Details of provision for on-site archaeological processing will be included in individual SSWSIs.

5.3 Archaeological Investigation During Construction Works

5.3.1 Regular monitoring visits will be undertaken by the ACoW during the Construction Works stage to ensure fencing and other protection measures are maintained and exclusion zones respected, and generally ensure that archaeological action areas protected during the Pre-construction Activities stage will not be impacted during construction. This will include action areas to be protected by temporary track matting or beneath fill, such as temporary access routes and construction compound areas (see section 4.8 of this document).

5.3.2 Where necessary, Aarchaeological mitigation will be designed and implemented during the Construction Works stage~~, in compound areas where it is unfeasible to achieve a no-dig solution (for example, where the sensitivity of archaeological remains likely to be present, based on the results of the archaeological evaluation, indicates that the use of fill would not be appropriate),~~ following archaeological evaluation as part of Pre-construction Activities. This mitigation may take the form of preservation of archaeological remains, archaeological excavation and recording or targeted archaeological monitoring and recording and would be set out by the Archaeological Contractor in a SSWSI, in consultation with the Viking CCS Heritage Consultees, and approved by the relevant local authority Archaeological Officer.

5.4 Artefact Assessment and Geoarchaeology Assessment

5.4.1 Assessment of material gathered from metal detection, geoarchaeological and palaeoenvironmental assessment will be undertaken concurrently with the on-site archaeological works (Pre-construction Activities and Construction Works stages) as part of an integrated, iterative strategy to ensure adherence to archaeological good practice in decision making during the fieldwork.

5.4.2 This will include rapid spot-dating of archaeological remains and assessment of their artefactual and palaeoenvironmental potential, so that archaeological features and deposits can be suitably targeted during the archaeological works. This will also ensure that these studies do not cause a delay for the post-excavation assessment, analysis and publication phases. Immediately after completion of fieldwork the processing of the remaining finds and environmental assemblages will be completed.

5.4.3 Regular reviews of the datasets will be undertaken during the archaeological works so that resources can be targeted appropriately for the post-excavation assessment, analysis and publication of the finds and environmental assemblages.

5.4.4 The results of ongoing spot-dating of archaeological remains and assessment of their artefactual and palaeoenvironmental potential will be communicated to the Viking CCS Heritage Consultees through the weekly reports described in section 6.2 below.

6 Communications and Monitoring of Archaeological Works

6.1 Communications Strategy

Reporting lines

6.1.1 The Archaeological Contractor will report to the construction contractor for the purposes of programming and co-ordination to ensure effective delivery of the archaeological works in accordance with the DAMS and the Draft CEMP.

6.1.2 The archaeological work will be overseen on behalf of the Client by the ACoW who will be based on Site as the Client's representative.

6.1.3 The Archaeological Contractor will only accept instruction from the construction contractor and ACoW.

Monitoring

6.1.4 The ACoW will liaise with the Archaeological Contractor and the construction contractor to monitor progress and compliance with the requirements of the DAMS~~, each MS~~ and each SSWSI. This will include (but is not limited to):

- Monitoring of all aspects of archaeological fieldwork, ~~at~~ during both ~~AW~~ Pre-Construction Activities and ~~C~~Construction Works stages.
- Monitoring of the effectiveness of protective measures for the historic environment (temporary fencing, track matting and fill areas).
- Provide Tool Box talks to inform Site personnel of heritage environmental constraints on Site.

6.1.5 The ACoW will act as coordinator in respect of access and monitoring arrangements with the Viking CCS Heritage Consultees and/or individual local authority Archaeological Officers and the Historic England Scientific Advisor. This will include oversight of engagement between the Archaeological Contractor and their specialists, and between the Archaeological Contractor and the Historic England Scientific Advisor, to ensure the timely provision of on-site advice to the fieldwork team.

6.1.6 The archaeological mitigation works will be subject to ongoing monitoring by the ACoW, who shall have unrestricted access to the action areas, site records or any other information as may be required. The work will be inspected to ensure that it is being carried out to the required standard and that it will achieve the desired aims and objectives.

6.1.7 Site meetings will be held as necessary throughout the archaeological programme to allow implementation of the archaeological mitigation works to be monitored to ensure adherence to each approved SSWSI ~~and Method Statement~~, to enable effective decision making where required, and to support timely sign-off of completed archaeological works. The Viking CCS Heritage Consultees and the relevant local authority Archaeological Officer will be invited to attend Site meetings in accordance with their roles.

6.1.8 The Viking CCS Heritage Consultees, local authority Archaeological Officers and the Historic England Scientific Advisor will be afforded access to the sites through regular Site meetings (see below); specific visits to access site records and any other information will be arranged as necessary and required by these Consultees through the ACoW.

Progress and consultation meetings

6.1.9 During the fieldwork regular meetings will be held to review progress and emerging results, review site strategies and to sign-off action areas to construction. Attendees will normally include, but are not limited to the following:

- Archaeological Clerk of Works.
- Representative(s) from the construction contractor's project management team and sub-contractors.
- Archaeological Contractor's Project Manager, environmental archaeology supervisor and other key members of the Archaeological Contractor's team such as the PACE specialist.
- The Viking CCS Heritage Consultees and local authority Archaeological Officer(s).
- Historic England Scientific Advisor.

6.1.10 It is anticipated that progress and consultation meetings will be held regularly (weekly, or at such longer interval as may be agreed) during fieldwork; the schedule for future and /or additional meetings will be confirmed at each meeting. This will ensure that programming details and updates are communicated rapidly and efficiently and will ensure that appropriate resources are available and can be deployed where they are required prior to the start of advance works such as temporary utility diversions and structures, or during construction itself. Regular communication (via email and telephone) will also be maintained between the project team (Archaeological Contractor, construction contractor and ACoW) throughout the archaeological mitigation programme to ensure the smooth running of the archaeological works.

6.1.11 The progress and consultation meetings will review implementation of the DAMS and the suitability and effectiveness of the sampling strategies adopted on the basis of specialist advice.

6.1.12 The ACoW and /or the Archaeological Contractor will give Tool Box Talks, to inform all Site personnel of historic environment constraints on Site, the protection measures that are required and their obligations under the DAMS and CEMP and generally to ensure that these are put in place and complied with (as provided for by the Draft CEMP [REP4-027] Table 3, draft Mitigation Register (Construction Phase) ref. D8, as certified by the DCO). The Tool Box Talks will identify sensitive action areas that must not be disturbed until investigation is completed and signed-off to construction, or where protection is required.

6.1.13 Monitoring of the public archaeology and community engagement programme will be included in the weekly progress meetings.

6.2 Progress Reporting During Fieldwork

Weekly Progress Reports

6.2.1 The Archaeological Contractor will prepare weekly illustrated progress reports which will be sent to the ACoW ~~during Phases 1 to 3~~. The ACoW will circulate progress reports to the Viking CCS Heritage Consultees and Historic England for information. The progress reports will include, as a minimum:

- General progress and current programme;
- Summary of work undertaken and the findings including significant artefacts etc.;
- Plans and photographs (as appropriate) showing features and areas referred to in the summary;

- Programme lookahead;
- Contractor issues/performance;
- Access/action area constraints;
- Health, Safety & Environment;
- AOB.

6.3 Monitoring of Post-Excavation Work

6.3.1 Following the completion of the fieldwork in each action area, the Archaeological Contractor will provide a programme of work and schedule for the completion of the Post-Excavation Assessment Report (PEAR; see Chapter 7, below) and will send it to the ACoW for approval. The ACoW will send the programme of work and schedule for completion of the PEAR to the heritage consultees to confirm implementation of and compliance with the approved SSWSI.

6.3.2 Regular meetings will be held throughout the post-excavation works to monitor progress and guide the assessment process on the basis of specialist advice. The schedule for these meetings will be determined by the ACoW prior to the commencement of the post-excavation programme, in consultation with the Viking CCS Heritage Consultees and the Historic England Scientific Advisor.

6.3.3 These meetings will normally be attended by the following, as required:

- Archaeological Clerk of Works.
- Archaeological Contractor's Project Manager.
- Archaeological Contractor's relevant specialists (as required).
- The Viking CCS Heritage Consultees.
- Historic England Scientific Advisor.

Post-Excavation Progress Reports

6.3.4 The Archaeological Contractor will submit regular post-excavation progress reports to the AcoW (minimum of one every six weeks). The AcoW will circulate progress reports to the Viking CCS Heritage Consultees and the Historic England Scientific Advisor, for information. The progress reports will include, as a minimum:

- General progress and current programme.
- Work completed, including a summary of significant results from specialist reports (as received).
- Issues/delays and proposed measures to rectify or mitigate these.
- Updated schedule of work.
- AOB.

6.4 Sign-off of Archaeological Work

6.4.1 The ACoW will inform the Contractor upon completion of fieldwork at each action area where investigations have been undertaken or where protection measures can be removed (see paragraph 4.9.5 above).

6.4.2 Action areas that have been completed (approved by the ACoW in consultation with the relevant local authority Archaeological Officer) will be subject to a formal signing-off

procedure. The Archaeological Contractor will submit a completion statement for each relevant action area to the ACoW ~~and the construction contractor~~for acceptance. The ACoW will submit the accepted completion statement to the relevant ~~local authority Archaeological Officer(s)~~Viking CCS Heritage Consultee for written confirmation (on behalf of the relevant planning authority) that the relevant works have been completed in compliance with the relevant SSWSI: the ACoW will not confirm hand-over of the relevant action area(s) to the construction contractor without such written confirmation from the Viking CCS Heritage Consultee.

6.4.3 A template Completion Statement is provided at Appendix C of this document.

7 Reporting, Publication and Dissemination

7.1 Outline Methodology for Reporting of Archaeological Investigations

7.1.1 Following the completion of the fieldwork on each action area, the processing of all finds and samples will be completed without delay. Each category of find or environmental/industrial material will be examined by a suitably qualified specialist so that the results can be included in the Post-Excavation Assessment Report (PEAR) to be produced at the end of the investigations.

Interim Statements

7.1.2 Interim Statements will be prepared and submitted to the ACoW within a set time frame (not less than two weeks and not more than four weeks for each action area) following completion of fieldwork at an action area or group of action areas that are related. ~~The purpose of each Interim Statement is to provide a basic account of the results of the fieldwork.~~ The time frame for the production of Interim Statements will be decided by the ACoW prior to the commencement of the post-excavation assessment for the relevant action area or group of action areas.

~~7.1.2~~7.1.3 The purpose of each Interim Statement is to provide a basic account of the results of the fieldwork. The ACoW will circulate the Interim statements to the relevant Viking CCS Heritage Consultees. The Interim Statements will include:

- A ~~brief summary~~short narrative of the main results for each action area(s);
- An accurate site plan of the mapped and excavated features for ~~A draft or sketch plan of~~ each action area(s);
- A quantification of the primary archive including finds and samples;
- Identify any issues that have arisen during the course of the fieldwork to ensure that there is integration across the Proposed Development between action areas and work stages; and
- A programme of work and schedule for the completion of the PEAR, for agreement with the ACoW and the relevant Viking CCS Heritage Consultees.

Post-Excavation Assessment Report (PEAR) and Archaeological Research Design (ARD)

~~7.1.3~~7.1.4 The Archaeological Contractor will meet the ~~set~~ agreed time frames (as set out in the Interim Statement for each action area or group of action areas) in order that the post-excavation assessment, analysis and publication phases can be programmed and resourced properly, and so that the completion date for all construction and post-excavation works can be met.

~~7.1.4~~7.1.5 Where appropriate and with the agreement of the relevant Viking CCS Heritage Consultees, ~~R~~results from several action areas may be combined and treated as one site for the purposes of the post-excavation (assessment and analysis) stages. The results from earlier evaluation surveys will also be assessed/reviewed by the Archaeological Contractor where it contributes to an understanding of a site and addresses the Archaeological Research Agenda and aims and objectives of each SSWSI. Following the completion of the post-excavation assessment, the original project objectives will be reviewed to determine the scope of any analysis and publication.

~~7.1.5~~7.1.6 The preparation of the project archive, post-excavation assessment and subsequent analysis and publication phases will be undertaken in accordance with the relevant SSWSI and Historic England guidelines (Historic England, 2015a), and other relevant archaeological standards and national guidelines (see Appendix A of this document). The different phases of reporting will be completed within a set time frame following completion of fieldwork, as agreed between the Archaeological Contractor and the ACoW in consultation with the Viking CCS Heritage Consultees.

~~7.1.6~~7.1.7 The format of the report is dependent upon the results of the investigations, but the PEAR will contain the following:

- A non-technical summary;
- Site location;
- Brief archaeological, historical and project background;
- Methodology;
- Aims and objectives;
- Results – factual data statements (stratigraphic, artefactual, environmental, initial scientific dating results);
- Statements of potential (stratigraphic, artefactual, environmental);
- Statements regarding immediate and long-term storage and curation;
- Review of original aims and objectives;
- Statement of the significance of the results in their local, regional and national context according to the regional research framework (Knight et al., 2012);
- Archaeological Research Design (ARD) that sets out how the Archaeological Research Agenda and the research aims and objectives of the SSWSI can be addressed at the analysis stage, and detailed proposals for publication and dissemination;
- Post-excavation analysis method statements;
- Recommendations for analysis, reporting and publication (including a synopsis of the proposed contents);
- Proposed resources and programming (task list linked to key personnel, time required, cost and key research questions that the task will answer or facilitate and programme cascade chart);
- General and detailed plans showing the location of the action areas/site accurately positioned on an OS base with grid co-ordinates and a plan of the identified archaeological remains (to a known/recognisable scale);
- Detailed plans and sections/profiles, deposit models etc., to support the narrative;
- Detailed stratigraphic matrix for each area excavated and how the areas interlink;
- Photographs and illustrations;
- Bibliography;
- A cross-referenced index to the project archive and summary of contexts; and
- Appendices containing specialist reports. (Specialist technical reports relating to the scope of work for the evaluation surveys will be reported in accordance with the requirements set out in the WSI for evaluation surveys, Section 7.3 (Earthwork

Survey), Section 7.4 (Metal Detector Survey), Section 7.5 (Trial Trenching), Section 7.6 (Geoarchaeology) REP2-016 / 017].)

~~7.1.7~~7.1.8 The PEAR and ARD will be submitted to the ACoW for review and comment. The Archaeological Contractor will address any comments that the ACoW may have. The ACoW will issue the revised draft report to the Viking CCS Heritage Consultees and Historic England for comment. In finalising the report, the Archaeological Contractor will take account of their comments.

7.2 Publication and Dissemination

7.2.1 The scope of the analysis and publication report will be dependent upon the assessment and future discussions to be held with the Client, the Viking CCS Heritage Consultees and Historic England, and will be subject to approval by the Viking CCS Heritage Consultees and Historic England.

7.2.2 The analysis stage will be undertaken in accordance with the ARD and will lead to the compilation of a research archive and the production of integrated report texts and illustrations for publication.

7.2.3 It is envisaged that interim reporting related to the evaluation surveys and mitigation will be published on the Archaeology Data Service.

7.2.4 Fieldwork updates will be published annually in fieldwork roundups in appropriate local and period journals. Fieldwork data would be fed into each relevant local authority Historic Environment Record.

7.2.5 It is anticipated that academic publications could take the form of either a multi-period monograph, a series of thematic or chronological monographs, and /or topic-, theme-, period-, or object-specific articles in appropriate journals. Popular booklets for children and adults may be produced by the Archaeological Contractor in tandem with formal assessment and analytical reporting.

7.2.6 The final scope and publication outlet/format for popular and academic publications associated with the Proposed Development have not yet been decided, but it is anticipated that these would be print publications also accessible online as open-access publications. Digital publication, dissemination and stable online archiving via the Archaeology Data Service archive would be prepared/arranged by the Archaeological Contractor.

8 Archive Preparation and Deposition

8.1 Archive Security and Storage

8.1.1 The finds and records generated by the fieldwork will be removed from the Site at the end of each working day and will be kept secure throughout he project (digital records will be saved and stored in accordance with the Digital Data Management Plan) (CIfA, 2020b; and Appendix A). The Archaeological Contractor will be responsible for the care of the project archive and should ensure that adequate resources are in place prior to the start of the fieldwork, including for the long-term storage. Arrangements should be made for the proper cataloguing and storage of the archive during the project life-cycle (it may be appropriate to liaise with an archive specialist).

8.1.2 The Archaeological Contractor will liaise with the Viking CCS Heritage Consultees at the initial project set-up to identify any specific requirements or policies of the recipient archive storage facilities (for example, the discard policy for retained finds), and for adhering to those requirements: the relevant repositories are identified in section 8.4 of this document (below). The Archaeological Contractor shall adhere to current national standards for the creation, compilation, transfer and curation of the archive (Brown, 2011; CIfA, 2020b; Historic England 2019b) and will inform the ACoW of the policies adopted.

8.1.3 On request, the Archaeological Contractor will provide the ACoW and the Viking CCS Heritage Consultees with copies of communications with the recipient archive storage facility and, ultimately, written confirmation of the deposition of the archive. The Client and ACoW will deal with the transfer of ownership and copyright issues. Any charges levied by the recipient archive storage facility for the long-term storage of the archive will be met by the project.

8.1.4 Viable pollen assemblages that are recovered will be deposited in the European Pollen Database (raw pollen counts) (http://www.europeanpollendatabase.net/index.php). Archaeobotanical data should be considered for inclusion into the ArboDat recording and database system (the UK ArboDat user group is administered by Historic England: see https://historicengland.org.uk/research/methods/archaeology/archaeobotany/).

8.1.5 Each SSWSI will require that all specialist data be supplied in data format (tables, csv etc): all specialist data should be incorporated into the Digital Archive in raw and processed data format (tables, csv etc).

8.1.6 Specialist data and reports will clearly state the research potential of the collections, highlighting these for the accessioning repository, as this will ensure that the potential of the collections can be promoted to researchers following deposition.

8.2 Consolidation of the Archive

8.2.1 The site records (list of fieldwork interventions, notebooks/diaries, context records, feature records, structure records, site geometry (drawings), photographs and films, finds records and associated datafiles) and recovered assemblages and the results of surveys will constitute the primary site archive. This is the key archive of the fieldwork project and the raw data upon which all subsequent assessment and analysis and future interpretation will be based. The archive will therefore not be altered or compromised. It will remain the original record of the fieldwork. The archive will be quantified, ordered, indexed and made internally consistent in line with current good practice. All finds and coarse-sieved and flotation samples will have been processed and stored under appropriate conditions.

8.2.2 The archive from the mitigation work may be combined with the archive from the archaeological evaluation surveys to form a single consolidated project archive. The deposition of the complete archive will form the final stage of the project.

8.3 Digital Archive

8.3.1 The requirements for the management and preservation of the digital records created during the project are outlined in the Strategy for Digital Data at Chapter 4.14 above.

8.3.2 Digital data and digital finds information will be archived to national standards (Appendix A) and will be transferred at the end of the project onto to a suitable facility or collections repository where it can be properly accessed, curated and maintained (such as Archaeology Data Service (University of York), or other cloud-based service).

8.4 Deposition of the Archive

8.4.1 The Archaeological Contractor, in liaison with the ACoW, shall ensure all written records of the archaeological investigations undertaken are completed and submitted in a timely manner (as provided for by the Draft CEMP [REP4-027] Table 3, draft Mitigation Register (Construction Phase) ref. D6, as certified by the DCO).

8.4.2 A copy of any analysis, reporting or publication required as part of the Mitigation Strategy shall be deposited with the relevant local authority repositories as part of the Proposed Development archives within 1 year of completion of the Proposed Development, or such other period as may be agreed in writing by the relevant planning authority. Archive should be deposited with an appropriate museum as follows:

- Lincolnshire County Council Heritage Service (for archive relating to sites within the jurisdictions of West Lindsey and East Lindsey District Councils);
- North Lincolnshire Museums (for archive relating to sites within the jurisdiction of North Lincolnshire Council); and
- North East Lincolnshire Council (for archive relating to sites within the jurisdiction of North East Lincolnshire Council).

PART THREE – REFERENCES AND APPENDICES

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Appendix B Outline Public Archaeology and Community Engagement Strategy

Introduction

This Outline Public Archaeology and Community Engagement (PACE) Strategy sets out an overarching strategy for outreach and engagement associated with the authorised development, as provided for by the Draft CEMP [REP4-027] Table 3, draft Mitigation Register (Construction Phase) ref. D6 (as certified by the DCO).

The Outline Viking CCS PACE Strategy includes potential site-based activities, initiatives to be undertaken while site work is ongoing, and activities to be undertaken throughout the post-excavation phase.

The initiatives aim to maximise the potential influence and learning opportunities resulting from the archaeological works, providing information to the widest variety of audiences, ranging from members of the public living in the vicinity of the authorised development to visitors to the area.

It is acknowledged that the type of events and activities outlined often attract the same group of people, generally including those who would frequent local museums and heritage attractions. Efforts should be made to reach those who would not usually engage with archaeology or community heritage in the wider area, to create a lasting legacy to the archaeological and other heritage works undertaken as part of the authorised development.

The off-site phase of the Viking CCS PACE Strategy will focus on making information available in more permanent formats, such as exhibitions, printed and pdf format booklets and web-based media. Lectures could be provided to groups with a specific interest in the archaeology of the area during this phase, though it is noted that this form of outreach is self-selecting and not especially effective in reaching significant audiences: resources are better focused on more general information provision.

The Archaeological Contractor will prepare a scheme-specific Viking CCS PACE Strategy, detailing the targeted audiences and the activities to be undertaken. This will include a programme of activities throughout the project lifecycle.

Aims and Objectives

Key research objectives have been identified for the mitigation phase of the Viking CCS Scheme, to ensure that research is focused on the principal questions that the Scheme has the potential to contribute to or answer. The evidence from these sites also has wider implications for the archaeology of the East of England region.

The aim of the Viking CCS PACE Strategy will be to raise awareness of the significance of the archaeological landscape, to provide a lasting legacy of the archaeological works, and to encourage the enjoyment, interaction and engagement with the archaeological process and discoveries arising from the mitigation works undertaken along the Scheme.

The objectives of the Viking CCS PACE programme will be:

- Engagement and appreciation: Encouraging engagement with and appreciation of the archaeological landscape.

- Knowledge about archaeology within and in the vicinity of the Scheme: Advancing public understanding and stimulating interest and public curiosity about archaeology within the Scheme.
- Public understanding of developer-led archaeology: Making the archaeological process more understandable for the public, particularly in relation to a major Solar Farm Scheme, explaining why the sites selected for investigation have been chosen while others have not.
- Accessible learning: Creating accessible learning opportunities for people to be involved in actively discovering more about their past.
- Disseminating fieldwork information: Disseminating information about the archaeology within the Scheme to schools, the local community, local societies and groups with a keen interest in history and archaeology, and the academic community via a variety of platforms.
- Sharing research: Showcasing the research impact of development-led archaeological fieldwork and how it can inform our understanding of the past with local and regional audiences, including academic interest.
- Inclusive participation: Encouraging engagement with those that may not normally engage with archaeology or local history.

Target Audience

A successful PACE Strategy must consider both who the audience is and the activities they want to partake in. The Viking CCS PACE Strategy should be tailored to meet the needs of the identified audience and provide engaging activities to add enjoyment. Outreach has traditionally been focused on a similar range of activities, such as public talks and site tours, but consideration should be given to other activities to widen the audience.

The P Viking CCS ACE Strategy is likely to focus predominantly on those communities directly impacted by the authorised development, or in its immediate vicinity, specifically those people living and working within or adjacent to the authorised development, and those passing through it via local historic lanes. The academic community at relevant universities may also be targeted through activities such as presentations at conferences, along with the promotion of events or exhibits that may engage with or encourage those who do not normally engage with those targeted by these sorts of events. This will increase the impact of the outreach and the overall project legacy.

Audiences could comprise:

- Local communities, particularly those in villages close to the Scheme, including, but not limited to, Immingham, Stallingborough, Irby upon Humber, Ashby cum Fenby, Ludborough and Grimoldby
- Primary and secondary school pupils and teachers.
- Local history groups, both within the Scheme area and the wider area, including history groups in other villages in the wider area.
- Members of local archaeology, history and civic societies.
- Council for British Archaeology (CBA) Young Archaeology Clubs, CBA regional groups.
- Higher education students, including archaeology students.
- Academic archaeologists and members of subject and period specialist societies.

- Relevant elected members.
- Interest-focused and period-focused archaeological research groups.
- Visitors to the area and people travelling through the landscape.

Other relevant groups will also be considered where appropriate.

Activities

A range of outreach and public archaeology activities should be proposed. These need to be tailored to the wants and needs of the differing audiences to maximise benefit.

Activities should be split across the different phases of archaeological work, including excavation and post-excavation. It is not anticipated that trial trench evaluation would form a suitable phase for public engagement unless specifically designed to engage a target audience. Later phases of work will provide different types of activity, although there will be some overlap (such as talks to local groups).

At all stages the research questions of the DAMS should be considered, to ensure that the knowledge gained from the archaeological mitigation programme is disseminated to the public.

The following list of suggested activities may not all take place, and other activity types may be more appropriate:

- A series of presentations to local groups and communities, both during excavation and post-excavation.
- Site tours during excavations.
- Community excavation or other fieldwork event (subject to suitable sites, access and health and safety).
- Liaison with local schools, including educational events, talks and finds handling, continuing to participate in STEM (Science, technology, engineering, and mathematics) events as well as the provision of teaching materials.
- Project website including information such as dig diaries, key finds, videoblogs from site, post-excavation analysis etc.
- Provision of information via social media platforms.
- Reaching a new audience. Activities and displays focused around popular non-heritage events. This strategy minimises the requirement for marketing, as it would make use of existing events that have their own promotional scheme in place. For example, a stall at local food festival could introduce participants to the weird and wonderful world of Roman foods - with information boards, finds from the sites, and food preparation exhibits. Tailored to location.
- Attendance at local history, archaeology or other heritage events.
- Pop-up displays of artefacts and information at community hubs or museums.
- Permanent information panels at suitable locations. This could include displayed QR codes which refer to a website or virtual reproduction.
- Production of a popular publications, on the Scheme as a whole, or covering thematic topics. A booklet for children could be considered.
- Mapping of features from historic maps.

- Contribution to academic and professional conferences (such as CIfA) and publication of papers.
- Artefact handling sessions.

Volunteer involvement in off-site post-excavation, such as finds cleaning, processing and recording, subject to regulations regarding the use of volunteers on development-led archaeological projects.

Media Strategy

Press releases to local, regional and national media outlets, and related social media activity, to promote the Viking CCS PACE activities and to inform of the progress of the archaeological mitigation programme will be managed by the Client in consultation with the ACoW, the Archaeological Contractor and the Viking CCS Heritage Consultees.

Appendix C Template Completion Statement

Site Name:	
Site Code:	
Historic Environment Investigation Type:	
Archaeological Contractor:	
Fieldwork Director:	
Site Area:	
Dates of fieldwork:	

Summary of Results

	Name	Signature	Date
Author:			
Checked:			
Approved:			

Confirmation of Release for Construction

	Name	Signature	Date
Confirmed by:			
Authorised on behalf of (LPA):			

PART FOUR – FIGURES

10 Figures

Please note that the absence of Provisional Archaeological Action Areas in this draft Mitigation Strategy does not denote that there will be no archaeological mitigation in all other areas. The provisional archaeological action areas shown in these Figures denote only the areas where the requirement for AER has already been identified. These Figures will be updated to show the extents of AMR as well as additional areas of AER, as relevant.

Figure 1: Provisional Archaeological Action Areas

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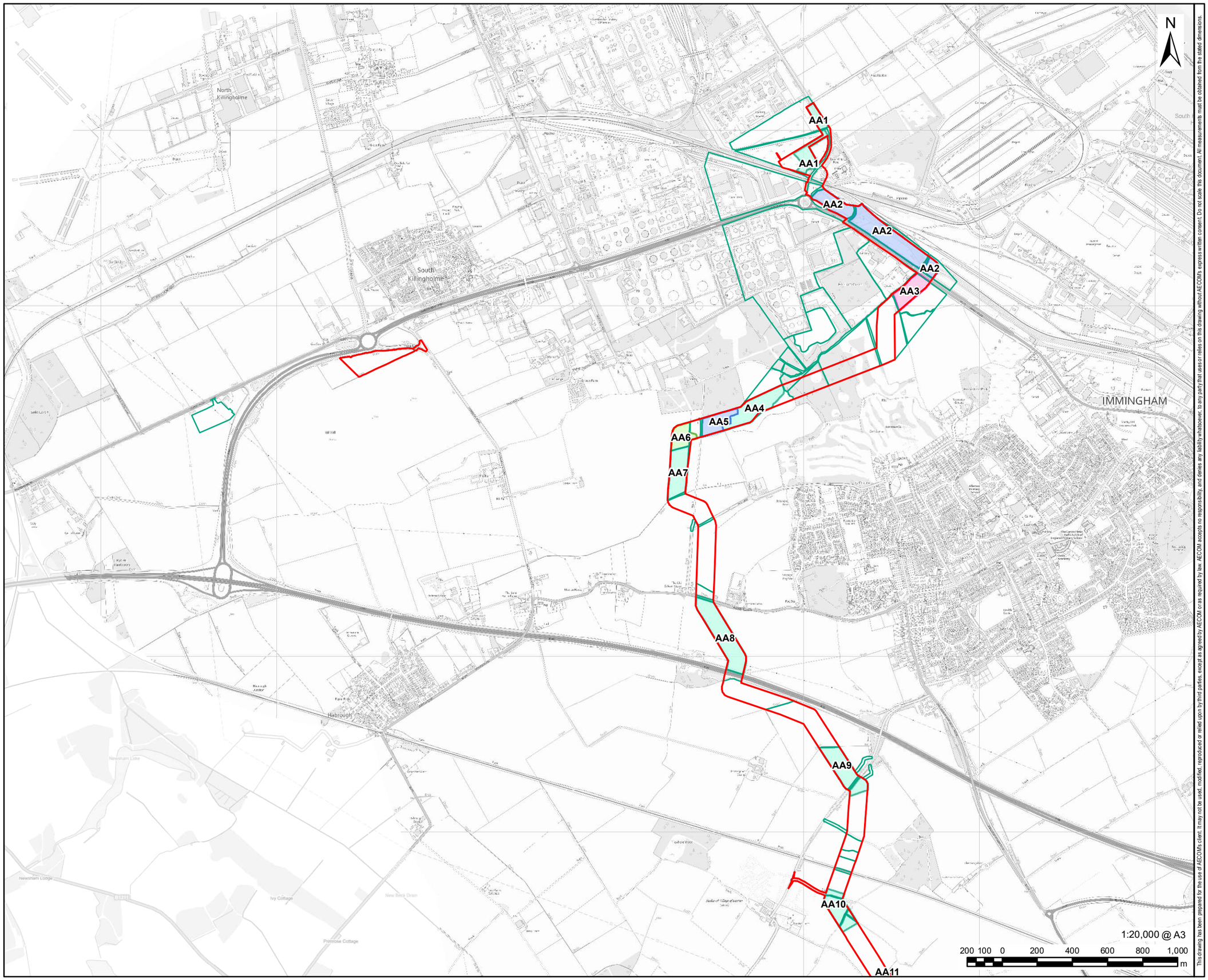

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Survey Field Boundary

Provisional Archaeological Action Area - Numbered (Type)

- AER (SMS)
- AER (targeted excavation & SMS)
- AER (targeted excavation)
- AMR

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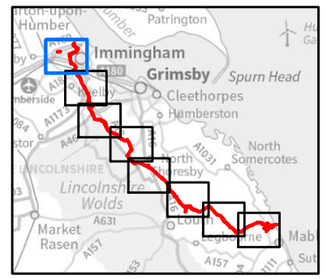

FIGURE TITLE

Figure 1 (1 of 8)
Provisional Archaeological Action Areas

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_1

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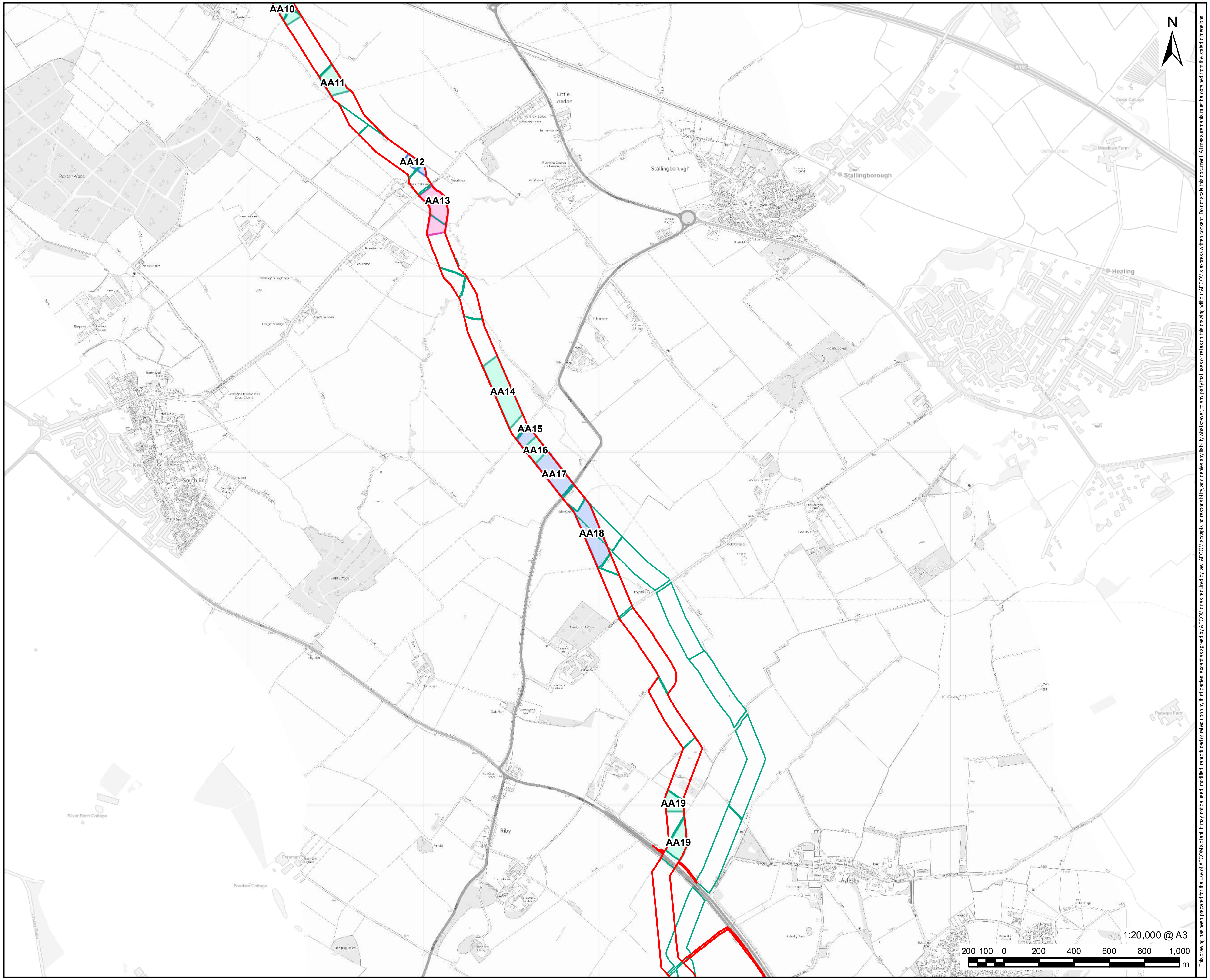

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Survey Field Boundary

Provisional Archaeological Action Area - Numbered (Type)

- AER (SMS)
- AER (targeted excavation & SMS)
- AMR

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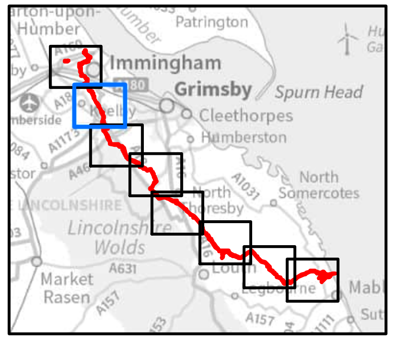

FIGURE TITLE

Figure 1 (2 of 8)
Provisional Archaeological Action Areas

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_1

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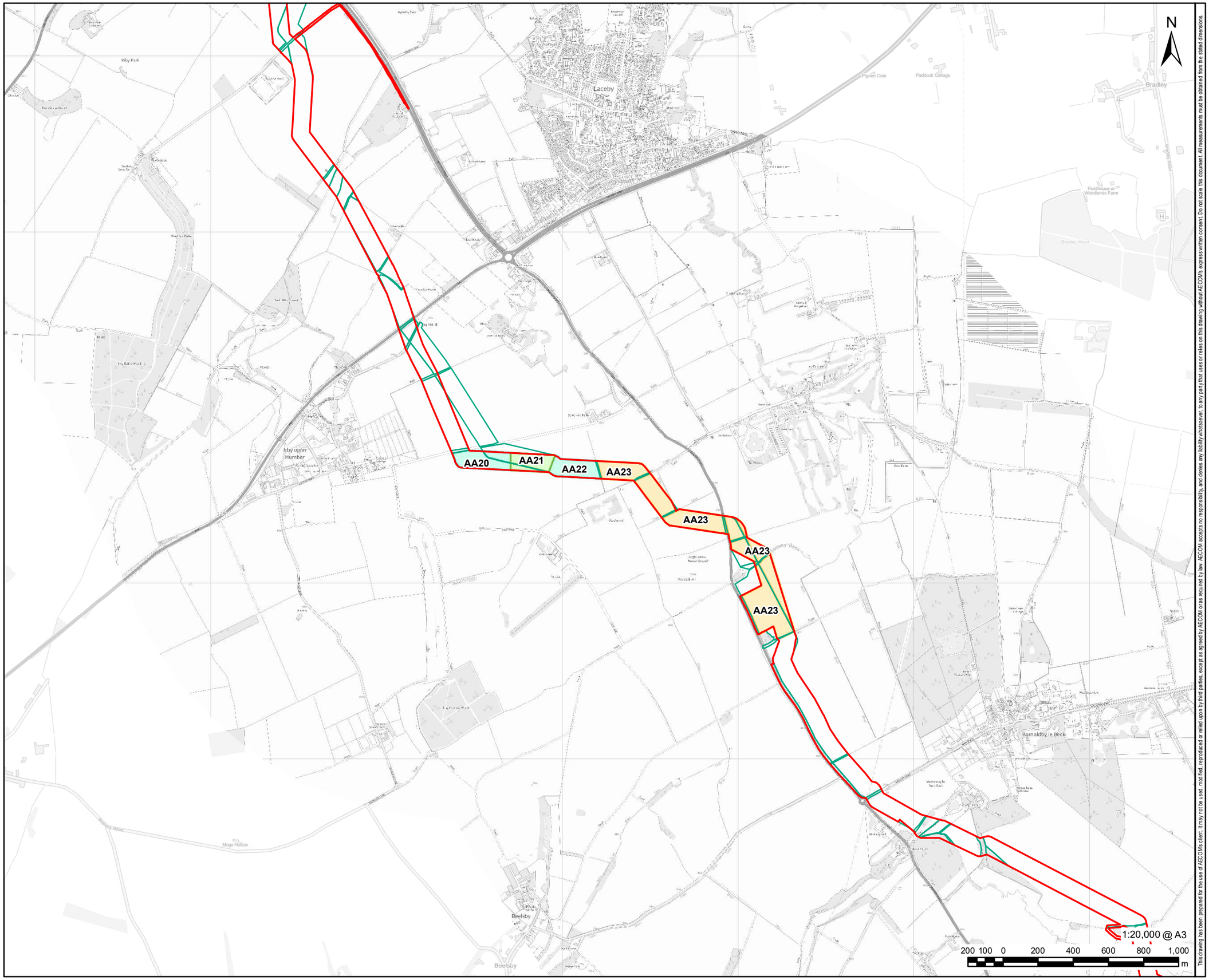

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Survey Field Boundary

Provisional Archaeological Action Area - Numbered (Type)

- AER (SMS)
- AER (targeted excavation)
- Provisional action area (approach TBC)

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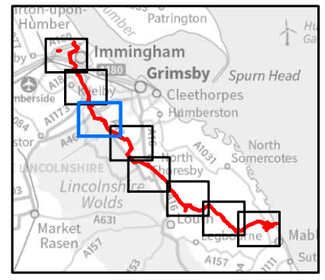

FIGURE TITLE

Figure 1 (3 of 8)
Provisional Archaeological Action Areas

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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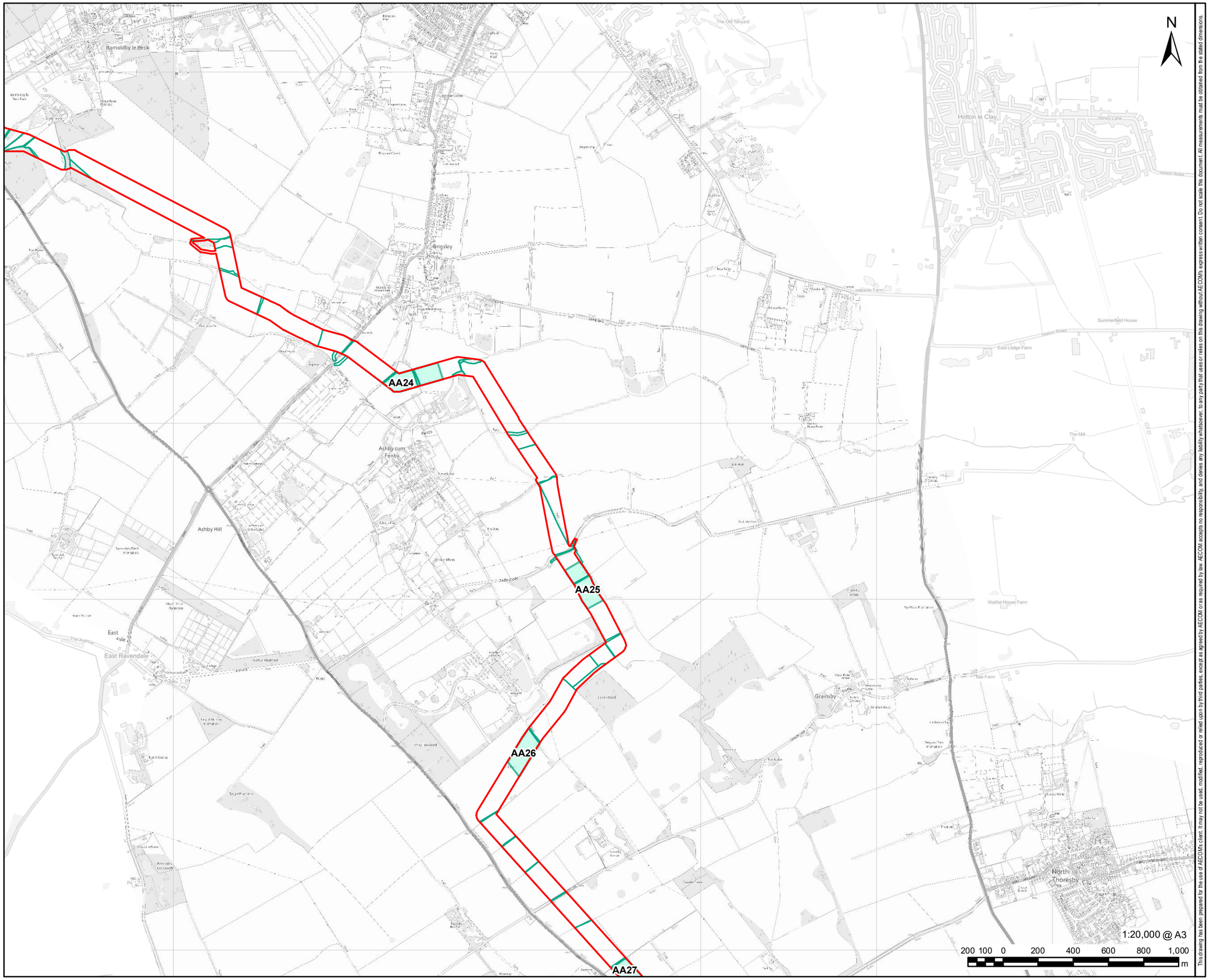

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Survey Field Boundary
- Provisional Archaeological Action Area - Numbered (Type)
- AER (SMS)

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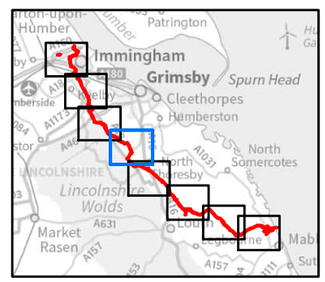

FIGURE TITLE

Figure 1 (4 of 8)
Provisional Archaeological Action Areas

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_1

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AA27
AA28
AA29
AA30
AA30
AA30
AA31
Cadeby Park
Ludborough
Wyham
Six Houses
Chalk Farm
Wyham House Farm
Vale Farm
Utterby
North Ormsby
Abbey Farm
West End Cottage
Top Farm
Black Leg Drain
New Drain
Manor Farm

N

1:20,000 @ A3

200 100 0 200 400 600 800 1,000 m

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Survey Field Boundary

Provisional Archaeological Action Area - Numbered (Type)

- AER (SMS)
- AMR

NOTES:

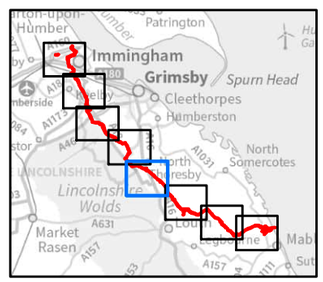

FIGURE TITLE

Figure 1 (5 of 8)
Provisional Archaeological Action Areas

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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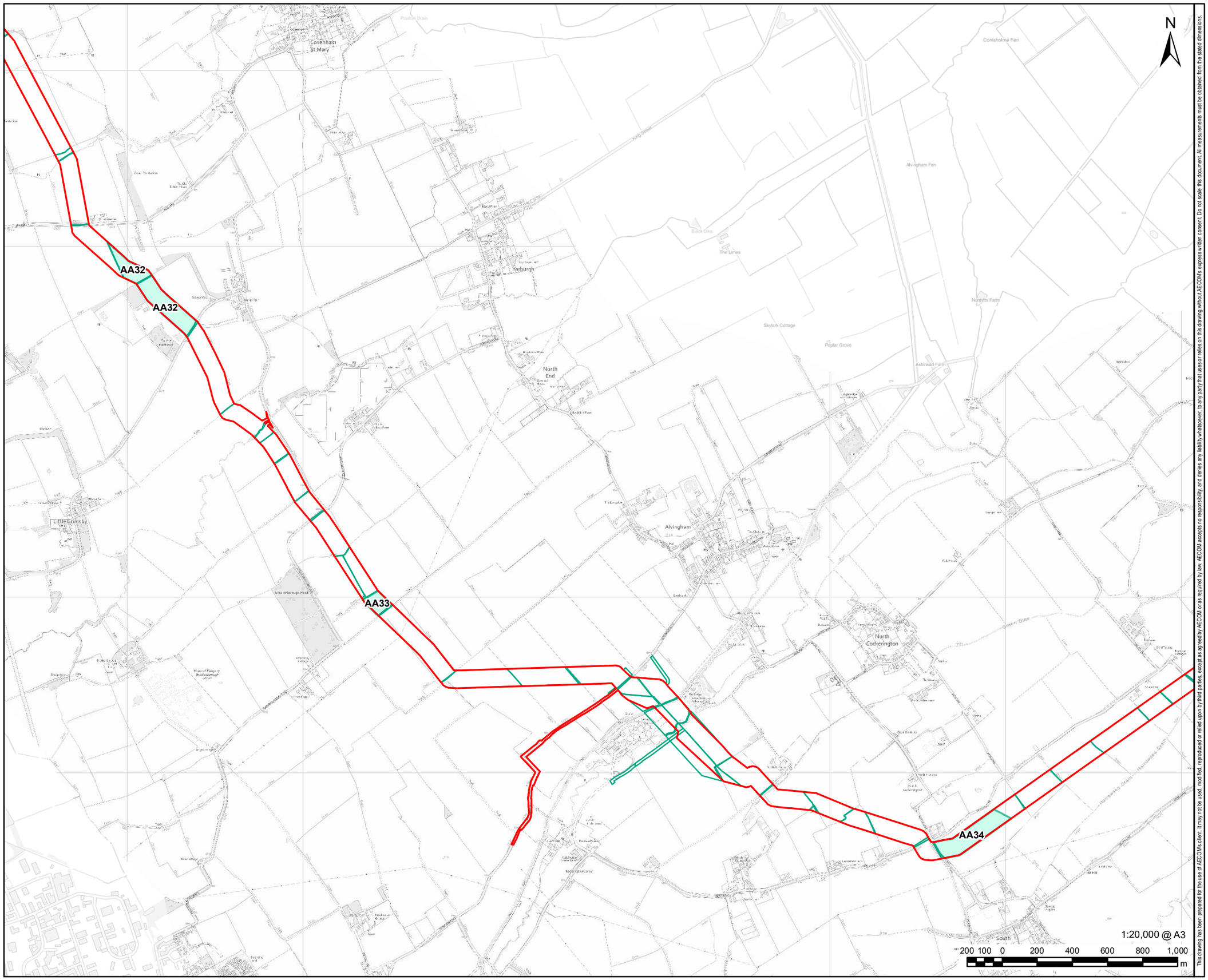

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Survey Field Boundary
- Provisional Archaeological Action Area - Numbered (Type)
- AER (SMS)

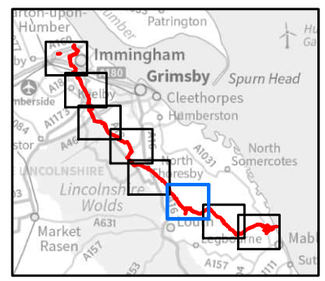

FIGURE TITLE

Figure 1 (6 of 8)
Provisional Archaeological Action Areas

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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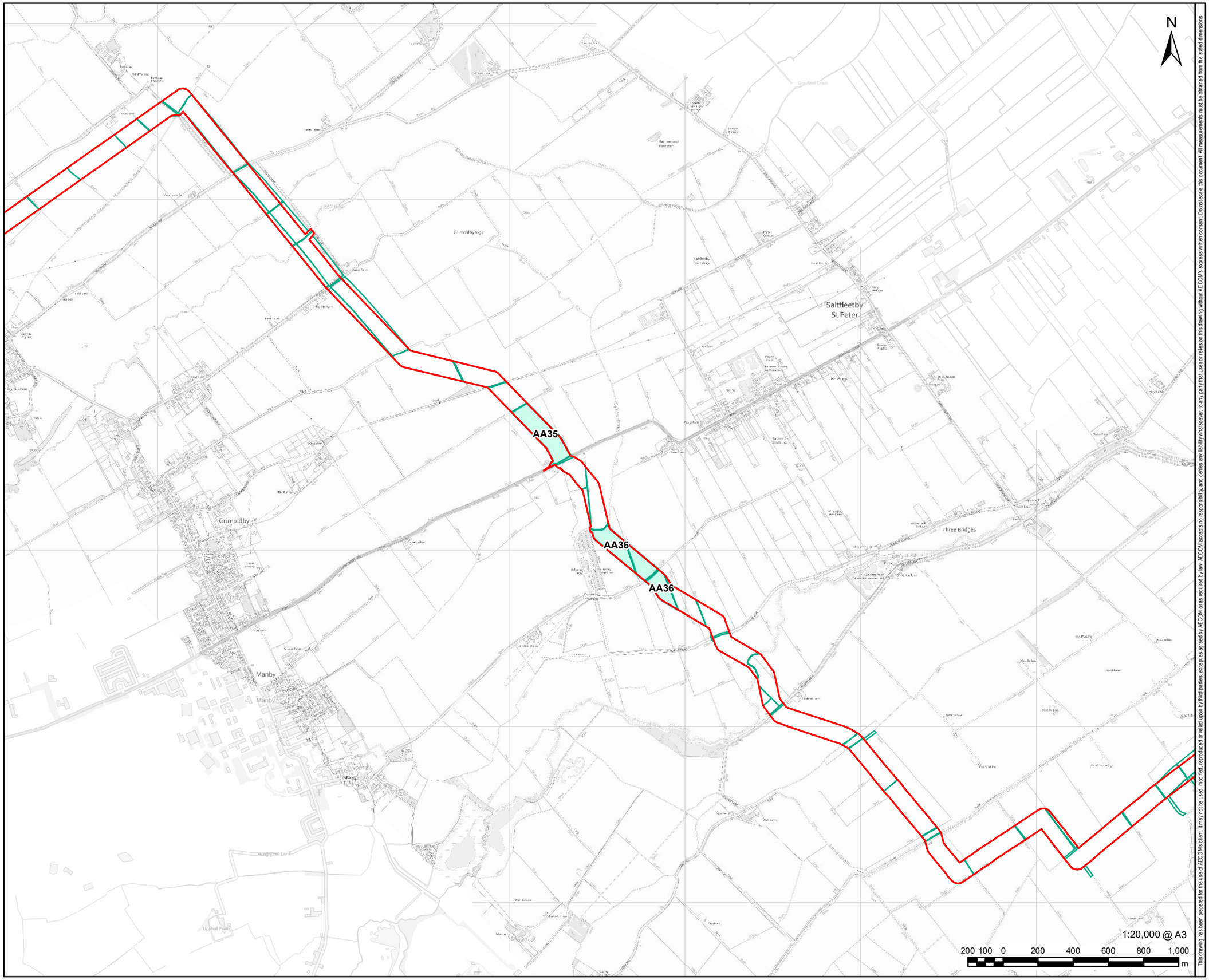

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Survey Field Boundary
- Provisional Archaeological Action Area - Numbered (Type)
- AER (SMS)

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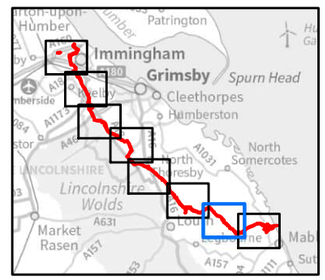

FIGURE TITLE

Figure 1 (7 of 8)
Provisional Archaeological Action Areas

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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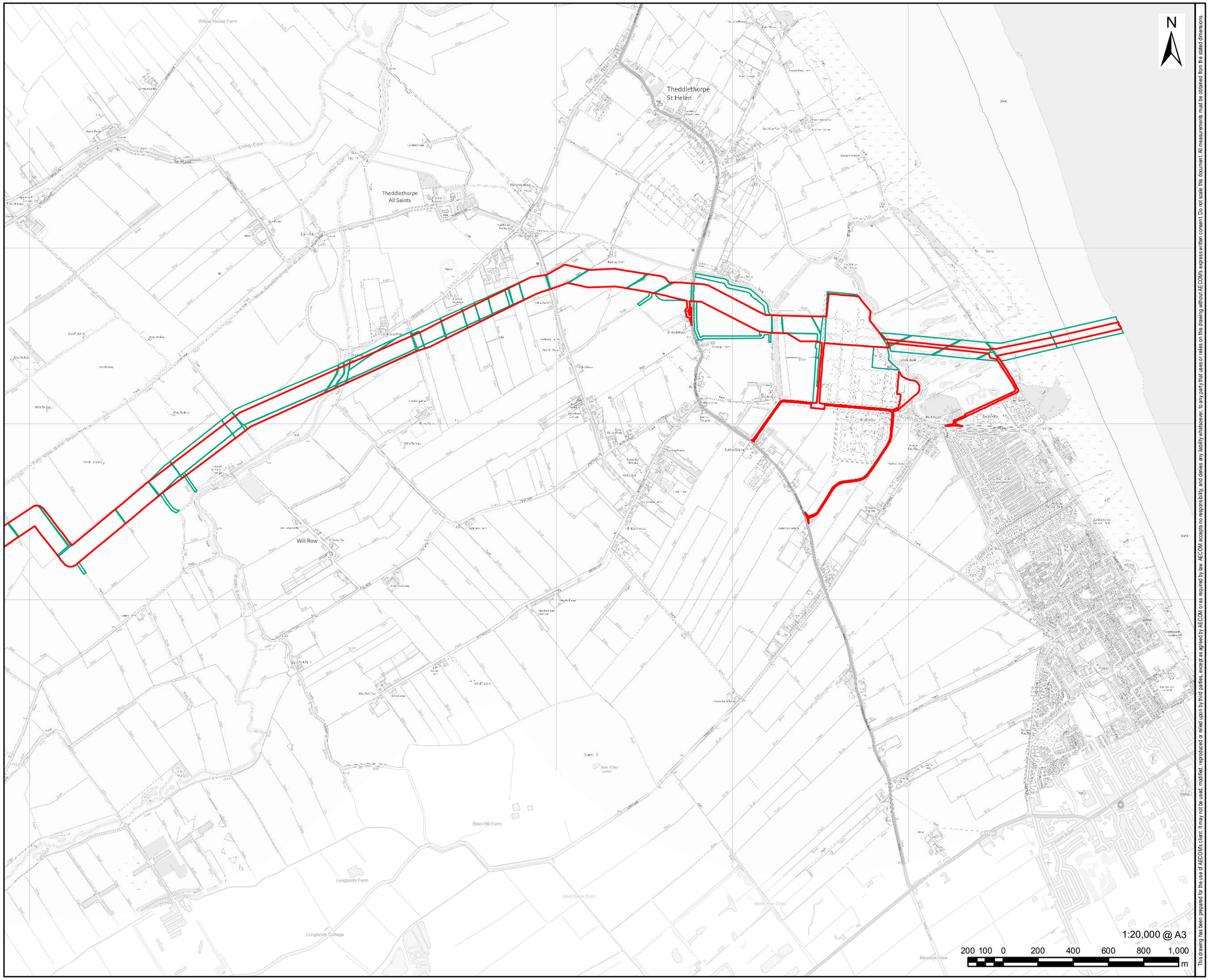

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Survey Field Boundary

NOTES:

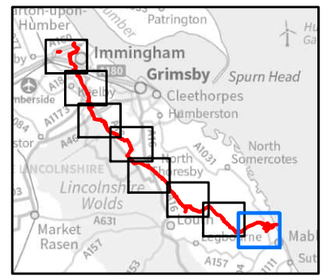

FIGURE TITLE

Figure 1 (8 of 8)
Provisional Archaeological Action Areas

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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Figure 2: Provisional Archaeological Action Areas – Detailed

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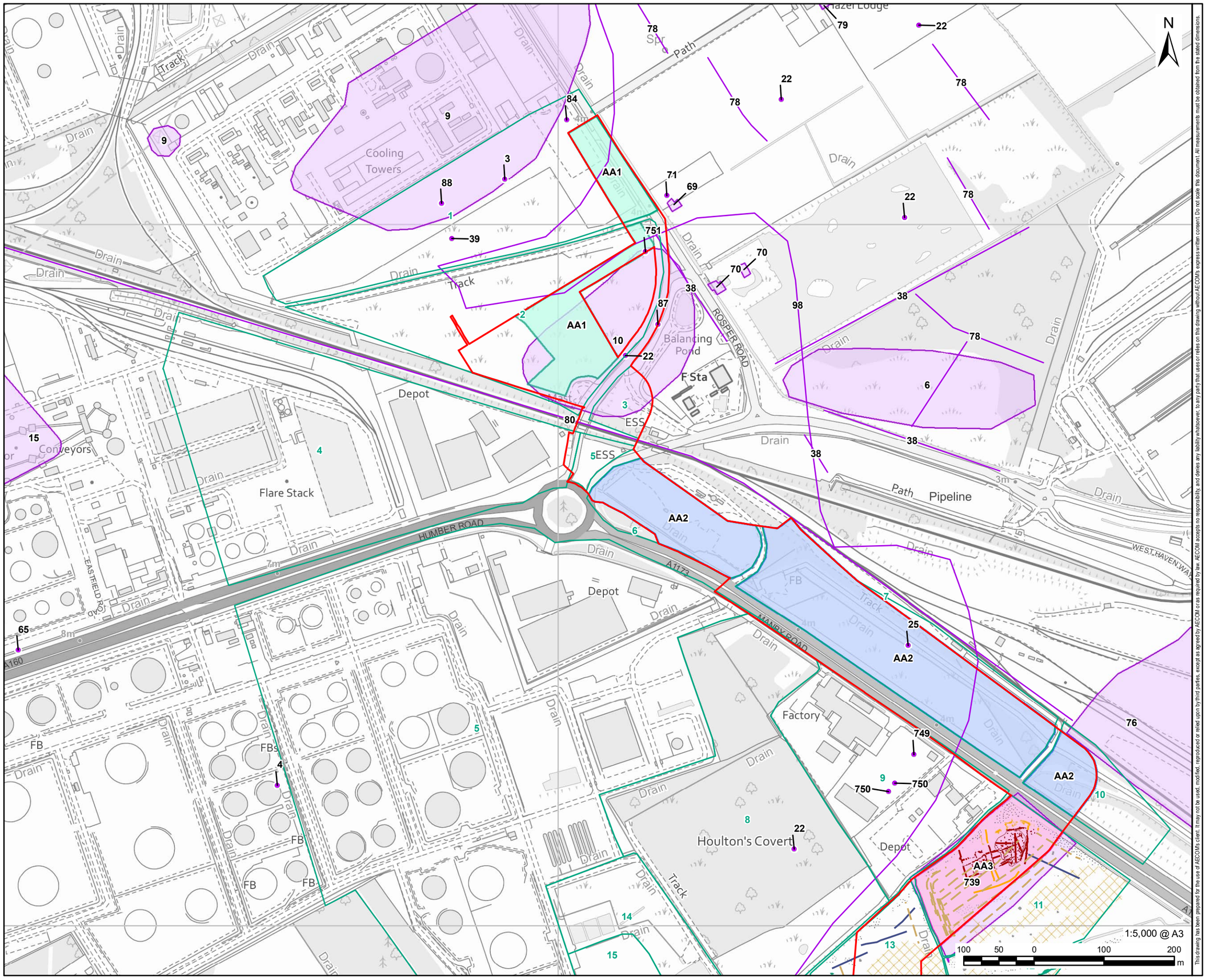

N

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Provisional Archaeological Action Area (Type)
- AER (SMS)
- AER (targeted excavation & SMS)
- AMR

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

FIGURE TITLE

Figure 2 (1 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)
- AER (targeted excavation & SMS)
- AER (targeted excavation)
- AMR

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

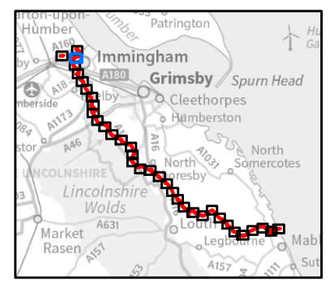

FIGURE TITLE

Figure 2 (2 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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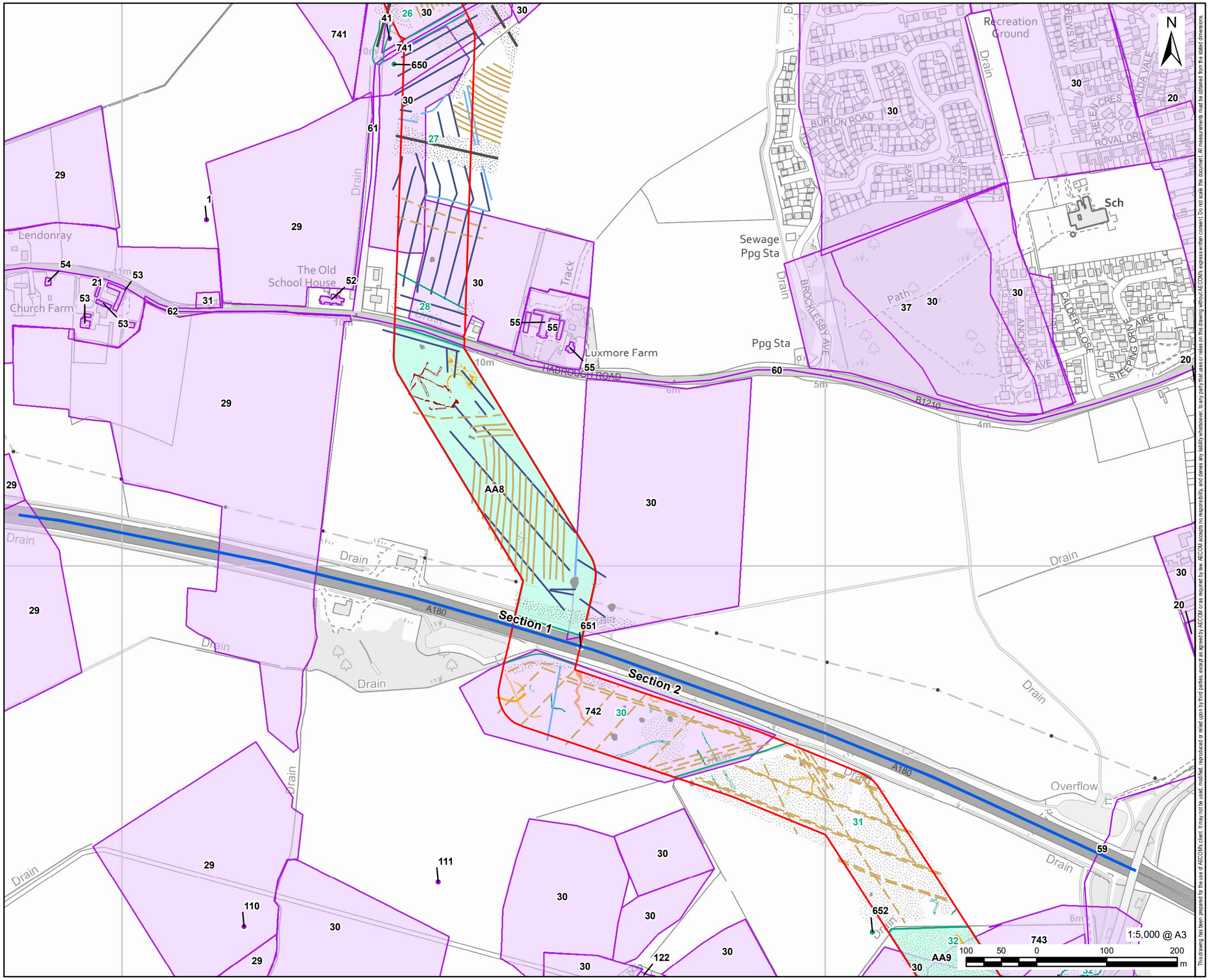
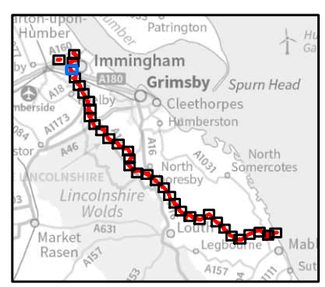


NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.



VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Route Section Break
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)

FIGURE TITLE

Figure 2 (3 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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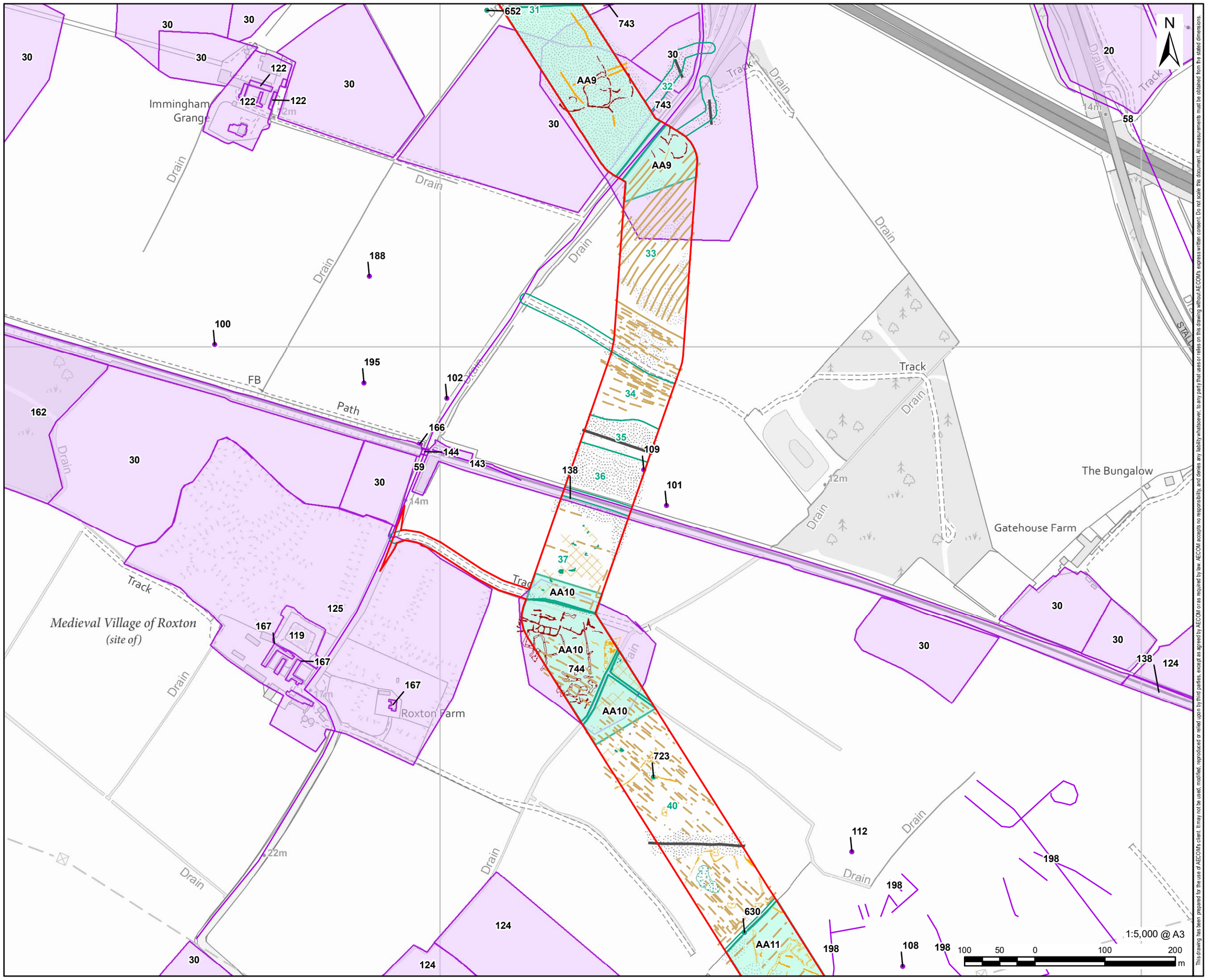

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

FIGURE TITLE

Figure 2 (4 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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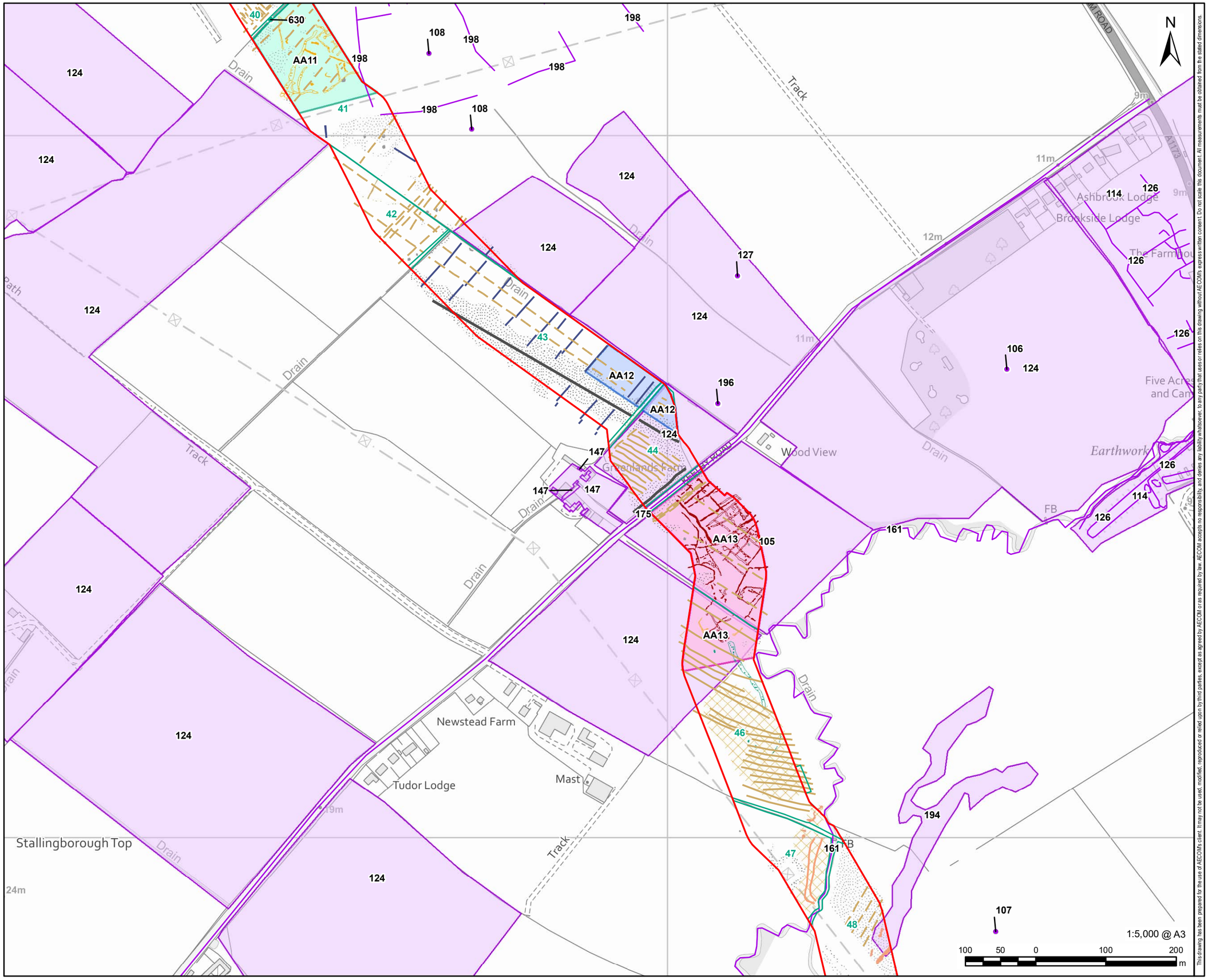

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)
- AER (targeted excavation & SMS)
- AMR

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

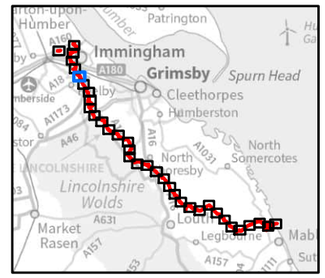

FIGURE TITLE

Figure 2 (5 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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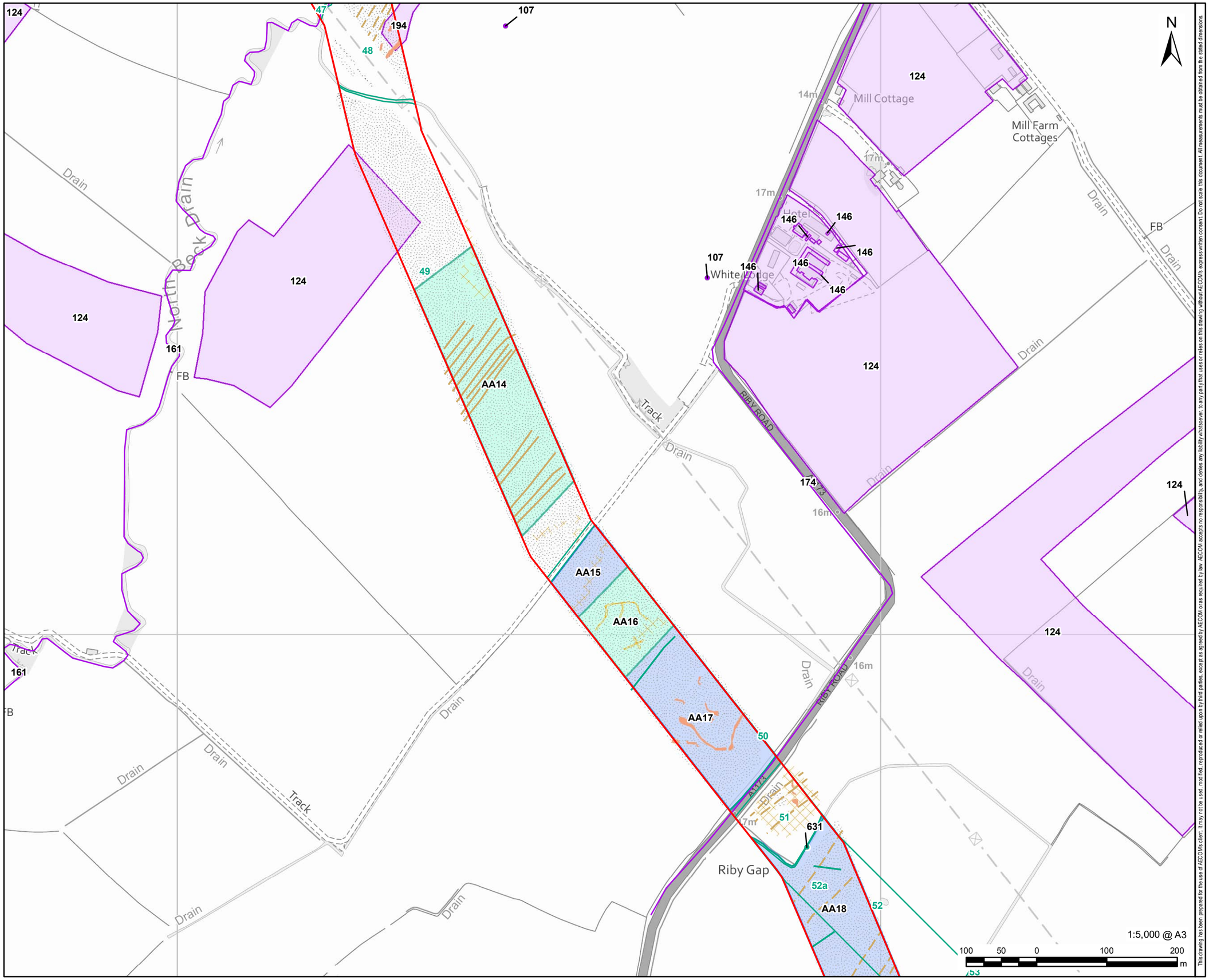

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)
- AMR

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

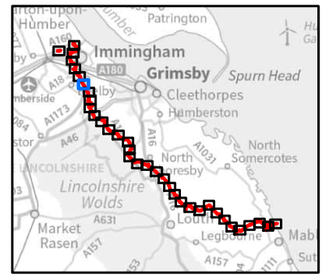

FIGURE TITLE

Figure 2 (6 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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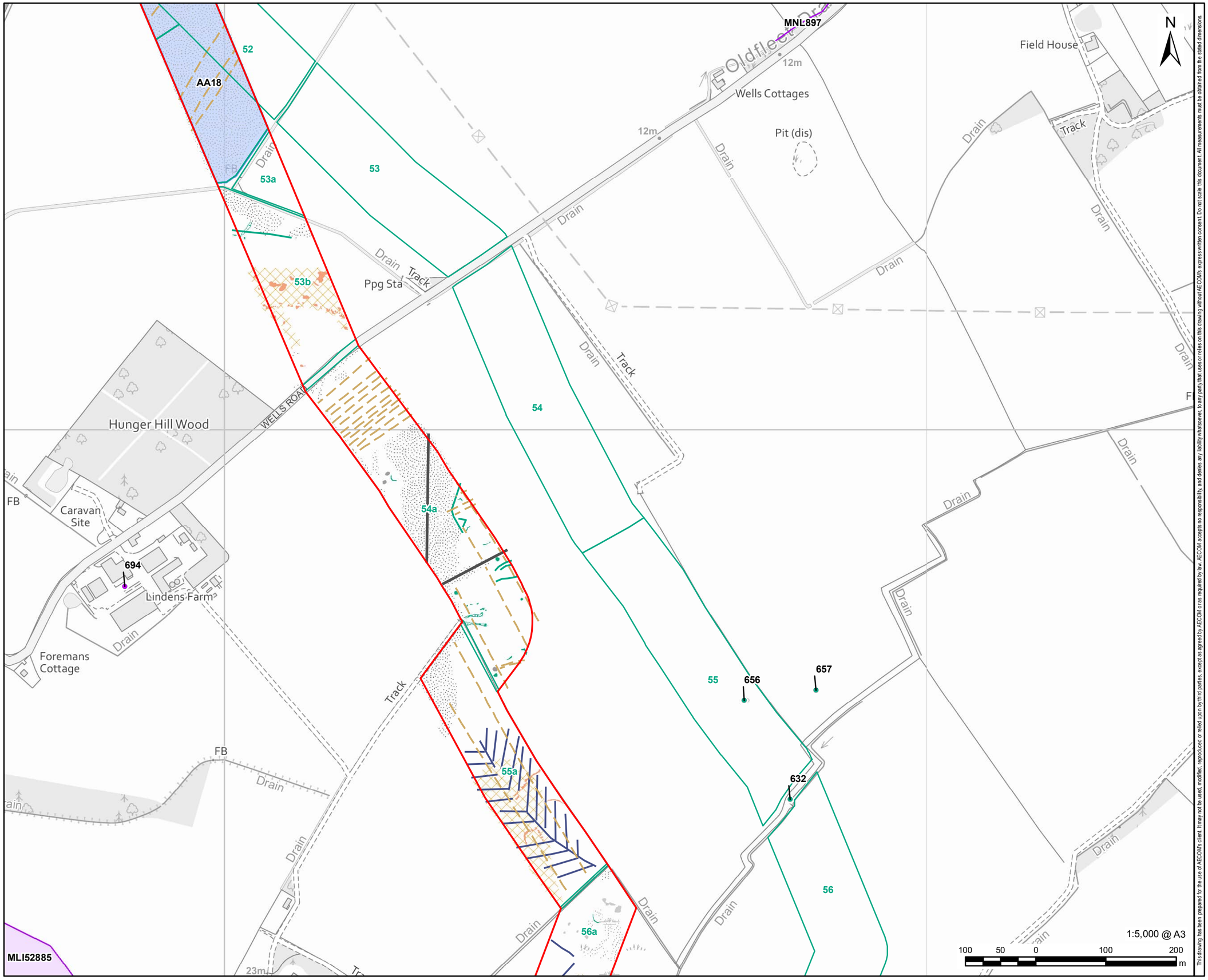

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AMR

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

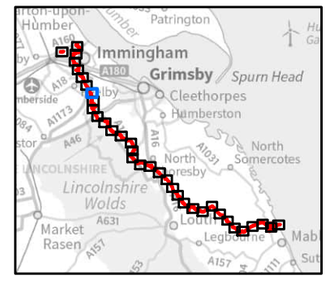

FIGURE TITLE

Figure 2 (7 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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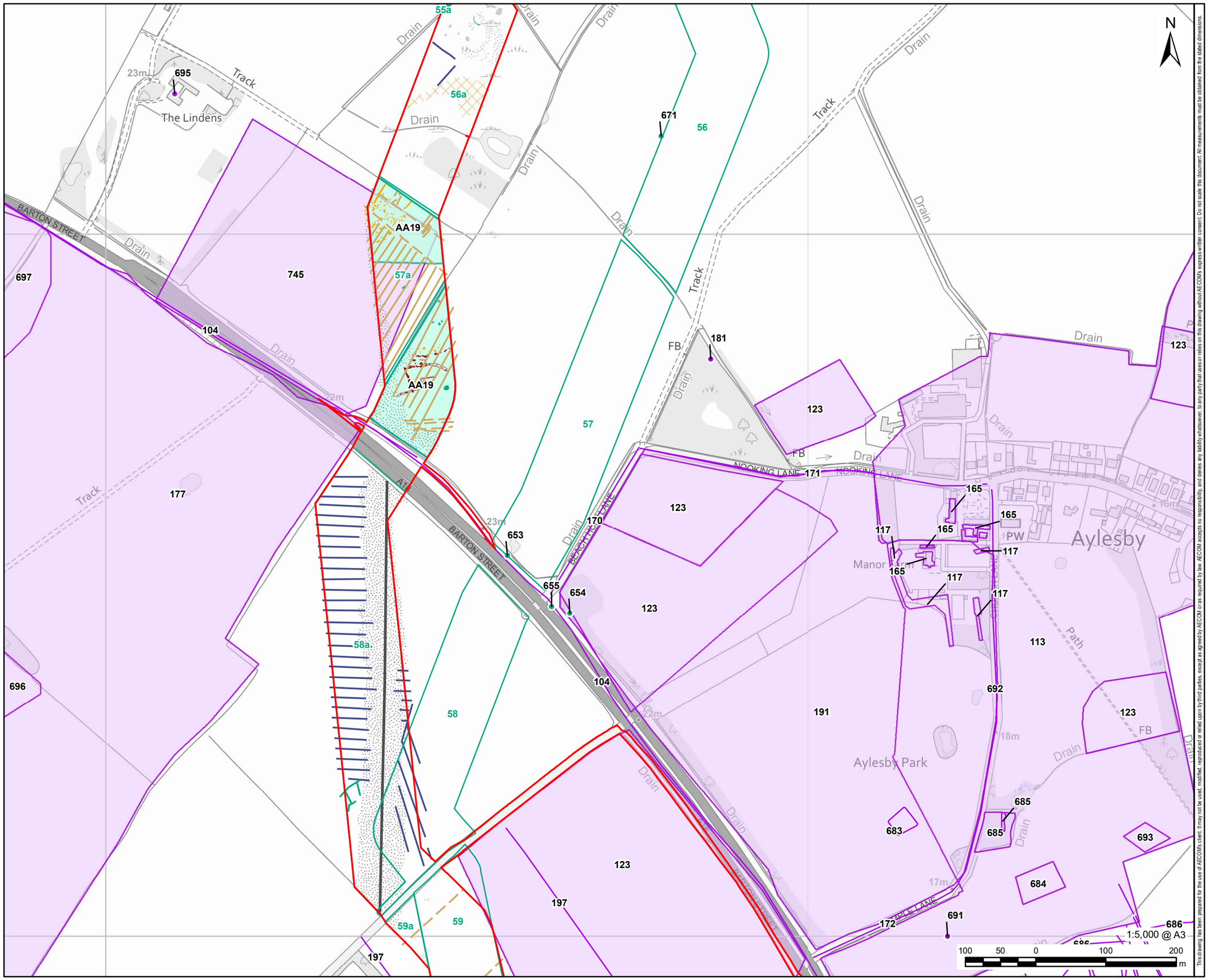
Filename: \\eu.aecomnet.com\EMAU\KIUKNCL2\Jobs\60668965 V_Net_Zero_Project\900_CAD_GIS\920_GIS\02_Maps\Arch Mitigation Strategy\VCCS_AMS_2_Provisional_Archaeological_Action_Areas_Detailed_v4_240918.mxd



VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

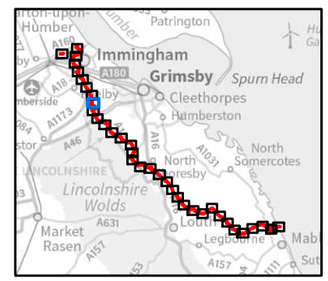


FIGURE TITLE

Figure 2 (8 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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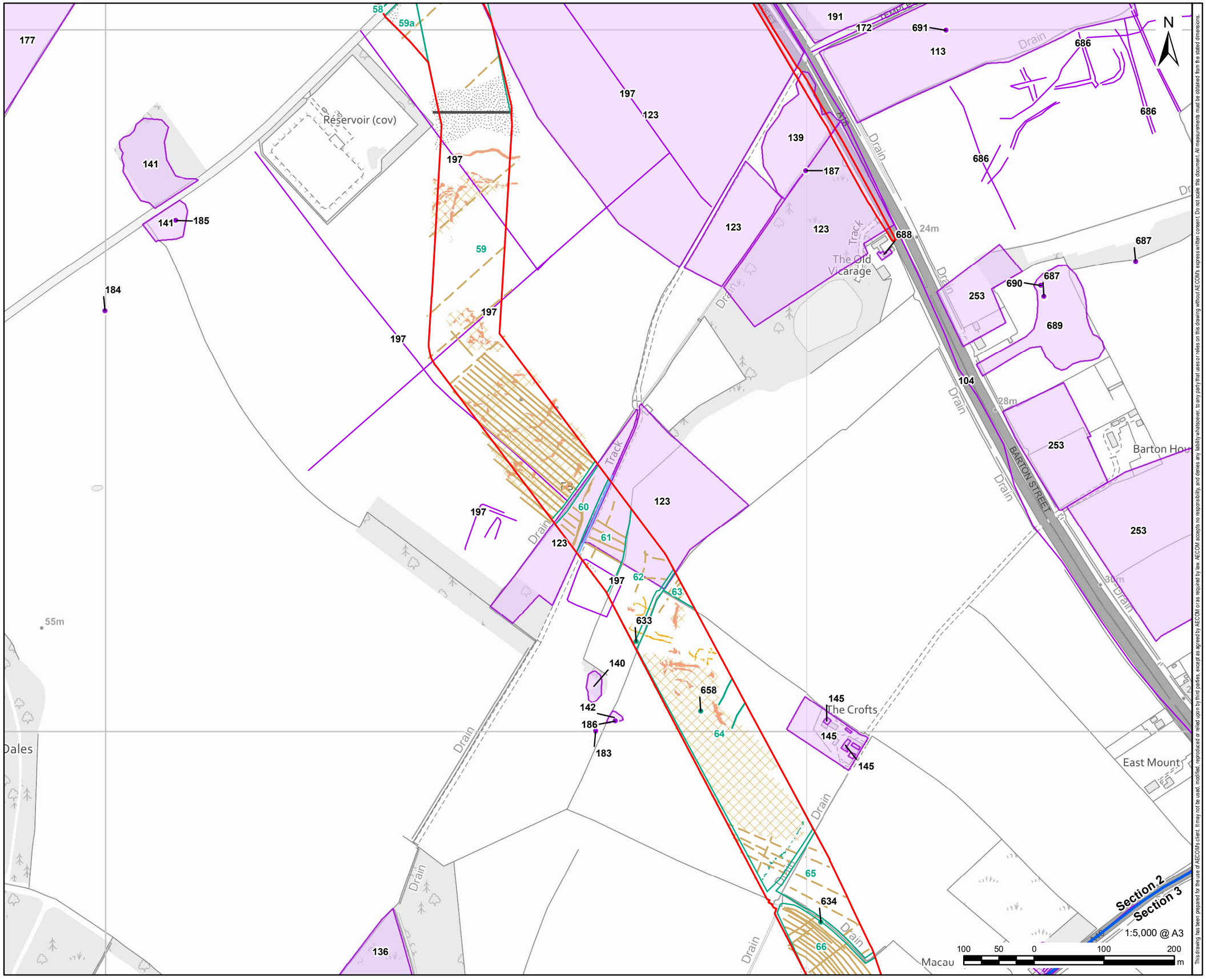

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Route Section Break
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

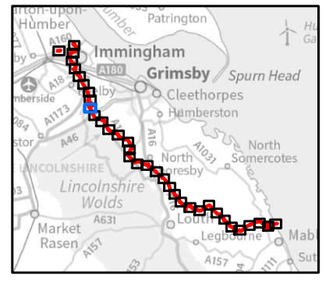

FIGURE TITLE

Figure 2 (9 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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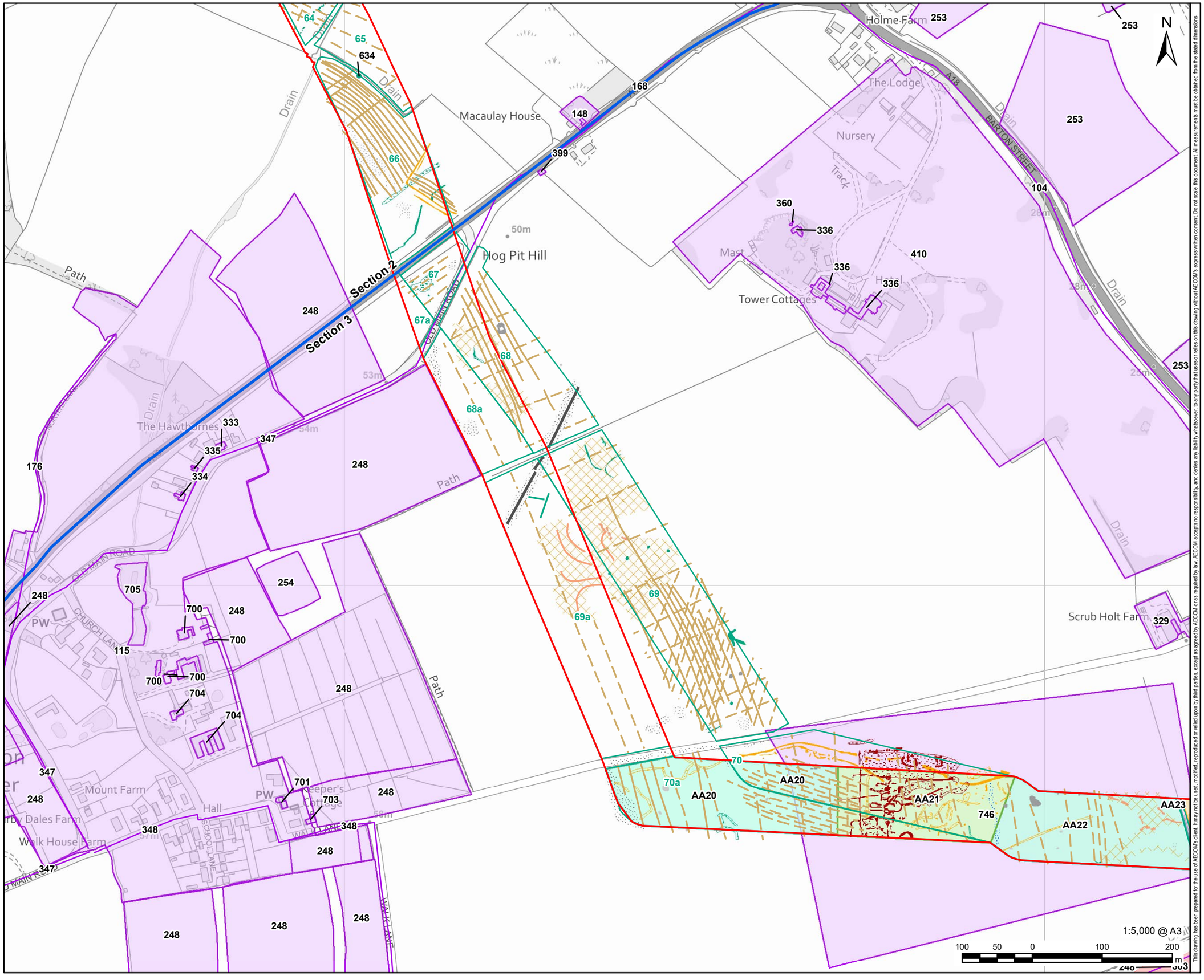

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Route Section Break
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset
- Scheduled Monument

Provisional Archaeological Action Area (Type)

- AER (SMS)
- AER (targeted excavation)
- Provisional action area (approach TBC)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

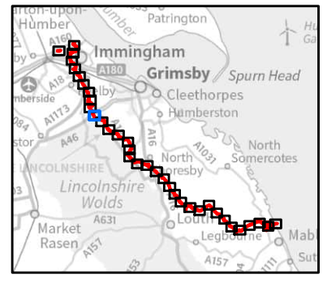

FIGURE TITLE

Figure 2 (10 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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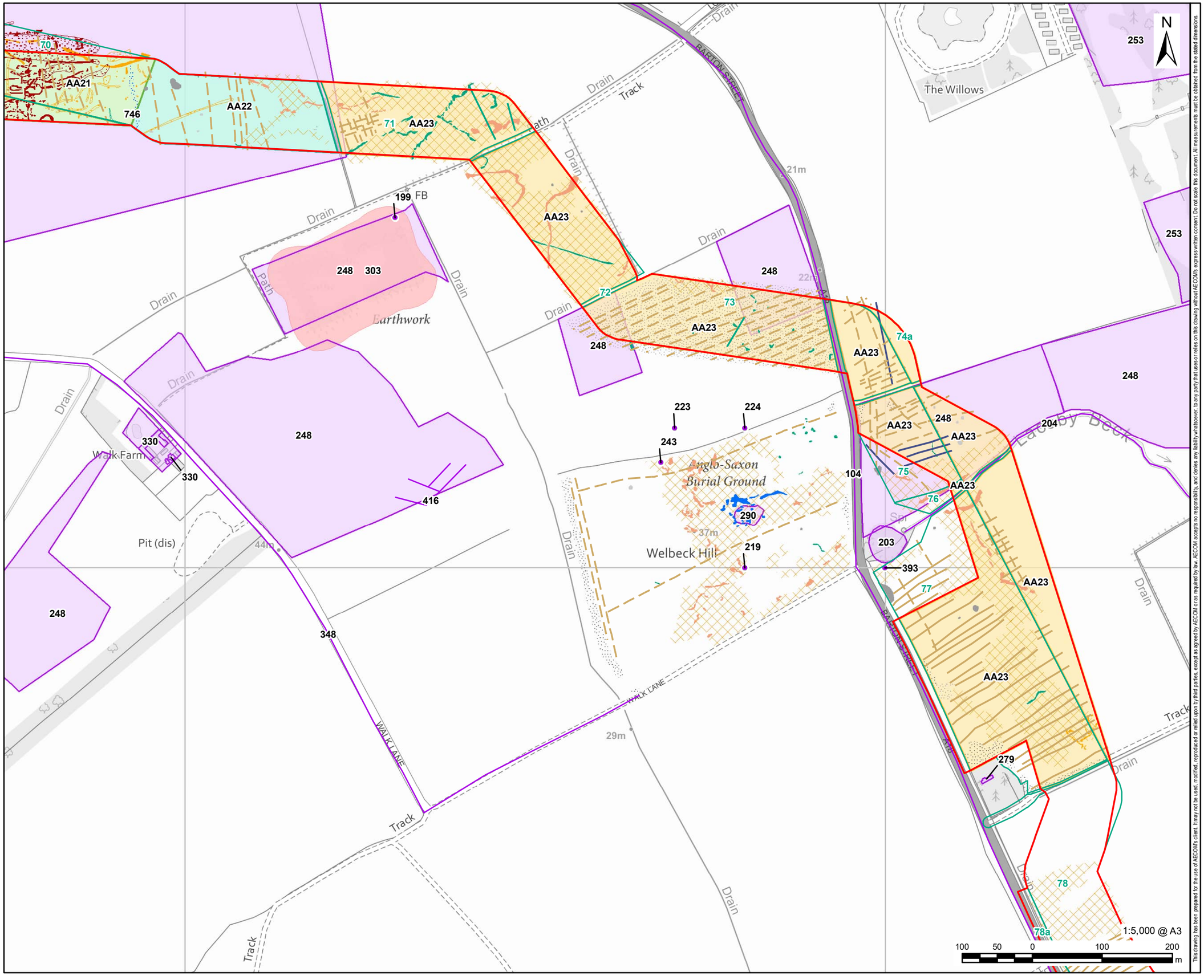

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Scheduled Monument

Provisional Archaeological Action Area (Type)

- AER (SMS)
- AER (targeted excavation)
- Provisional action area (approach TBC)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

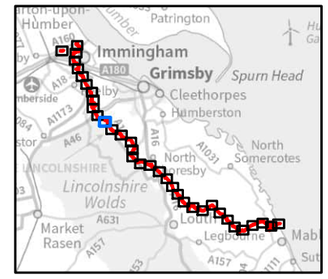

FIGURE TITLE

Figure 2 (11 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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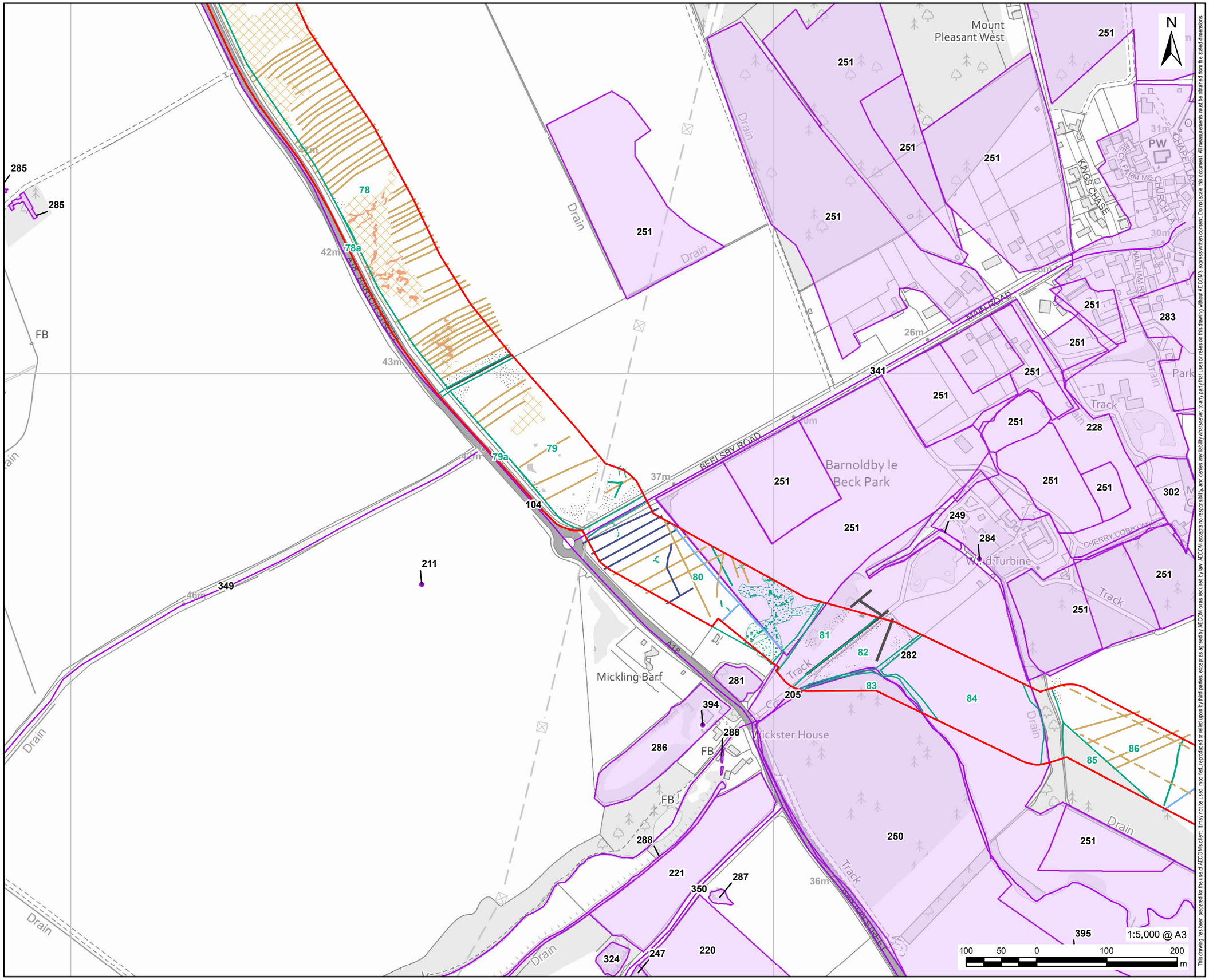


VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

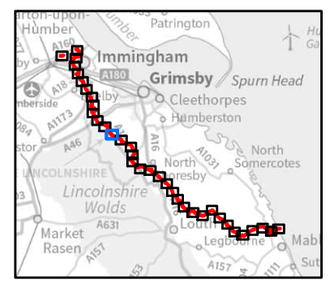


FIGURE TITLE

Figure 2 (12 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

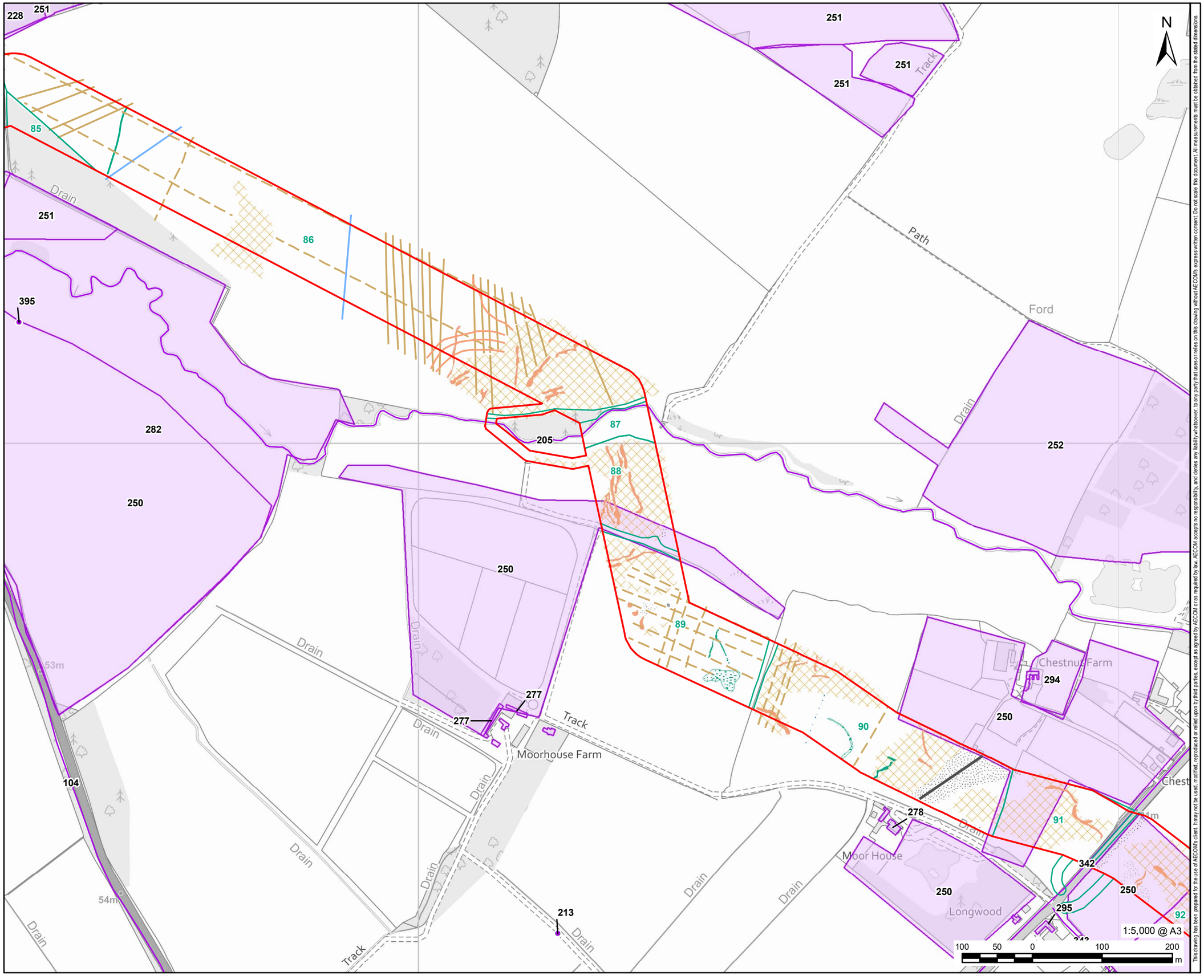
ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

Filename: \\eu.aecomnet.com\EMIA\UKI\UKNCL2\Jobs\60668965 V_Net_Zero_Project\600_CAD_GIS\020_GIS\02_Maps\Arch Mitigation Strategy\VCCS_AMS_2_Provisional_Archaeological_Action_Areas_Detailed_v4_240918.mxd



VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

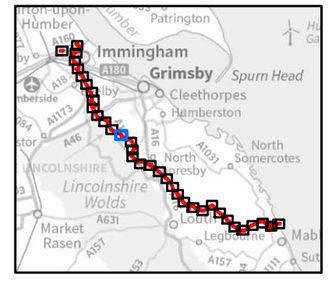


FIGURE TITLE

Figure 2 (13 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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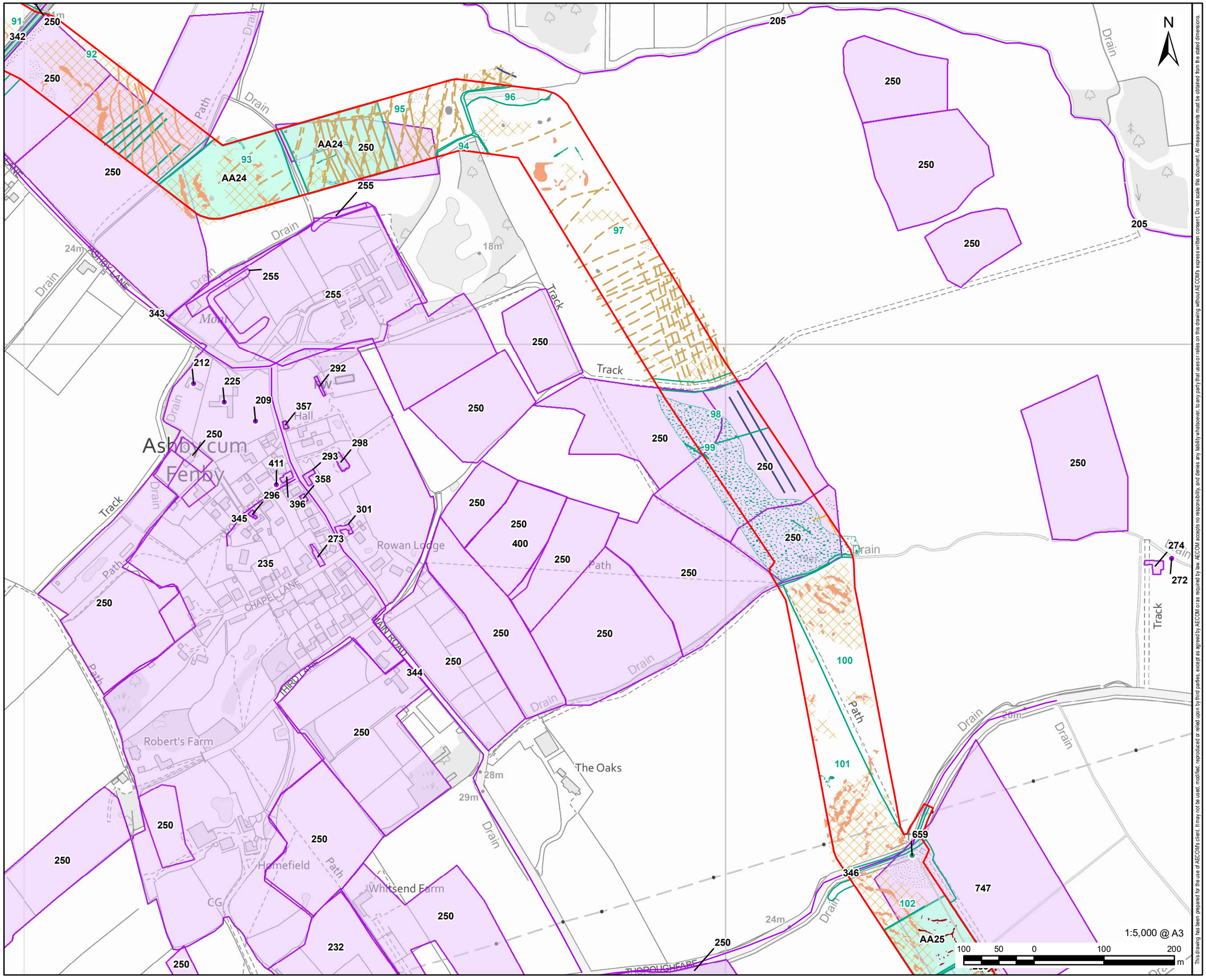

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

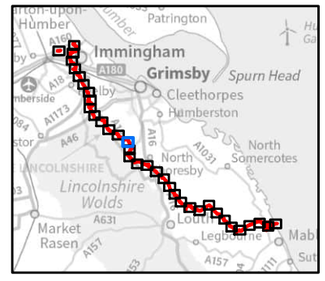

FIGURE TITLE

Figure 2 (14 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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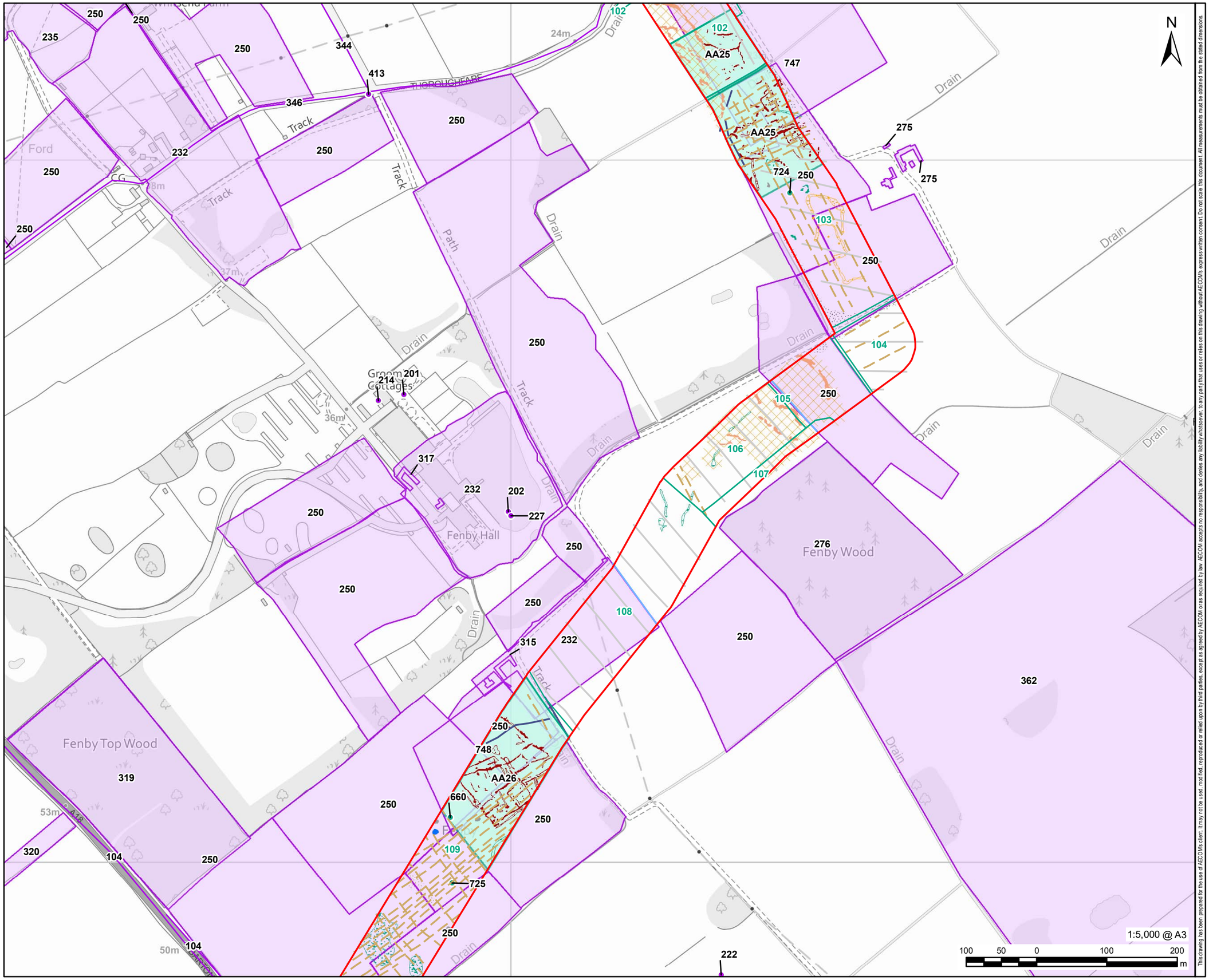

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

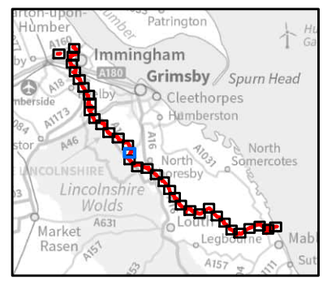

FIGURE TITLE

Figure 2 (15 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

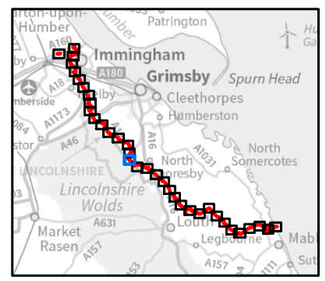

FIGURE TITLE

Figure 2 (16 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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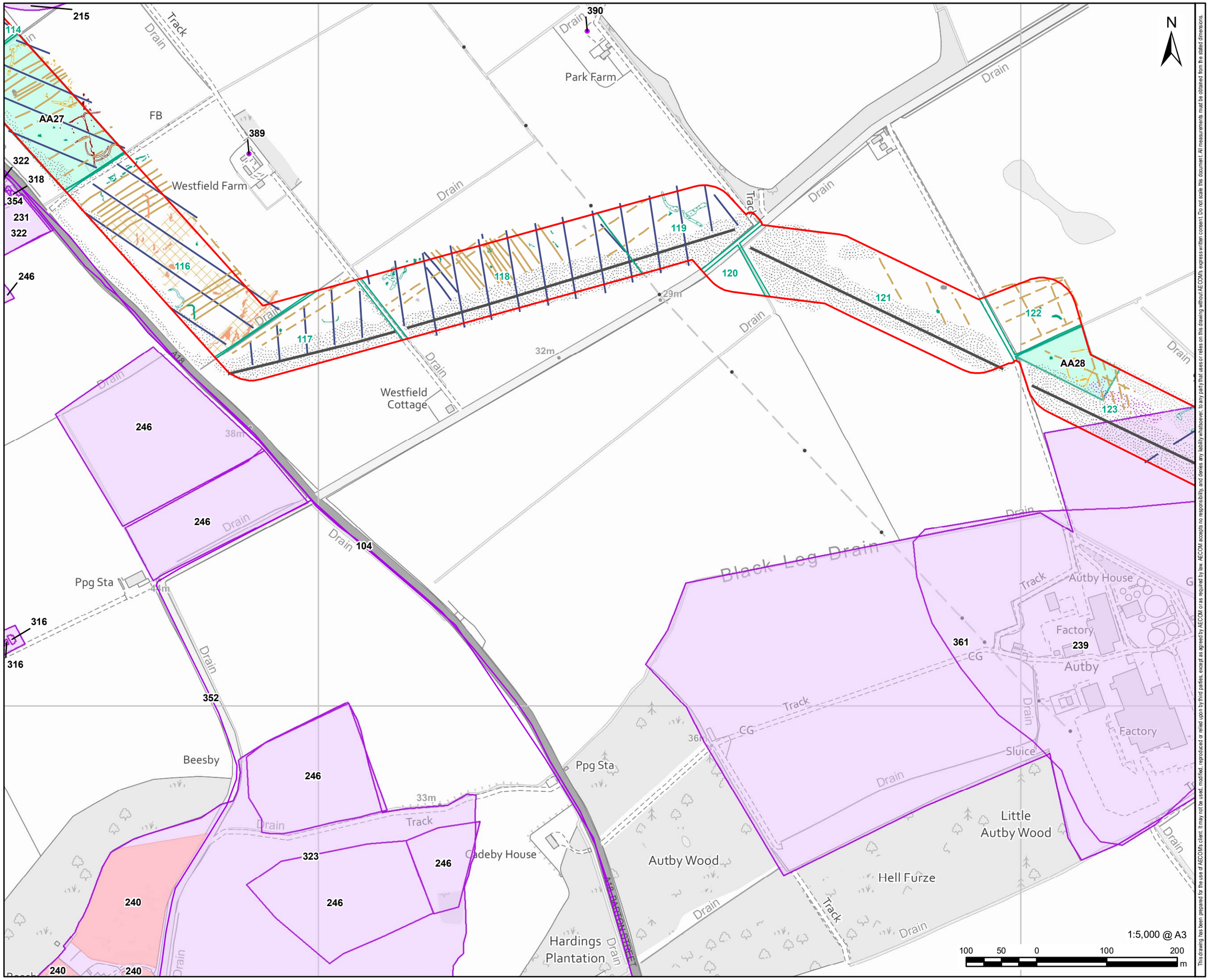

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Scheduled Monument

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

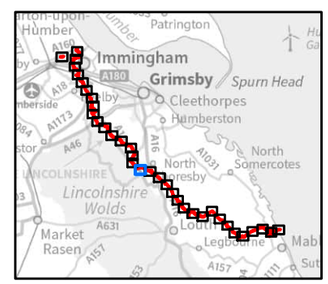

FIGURE TITLE

Figure 2 (17 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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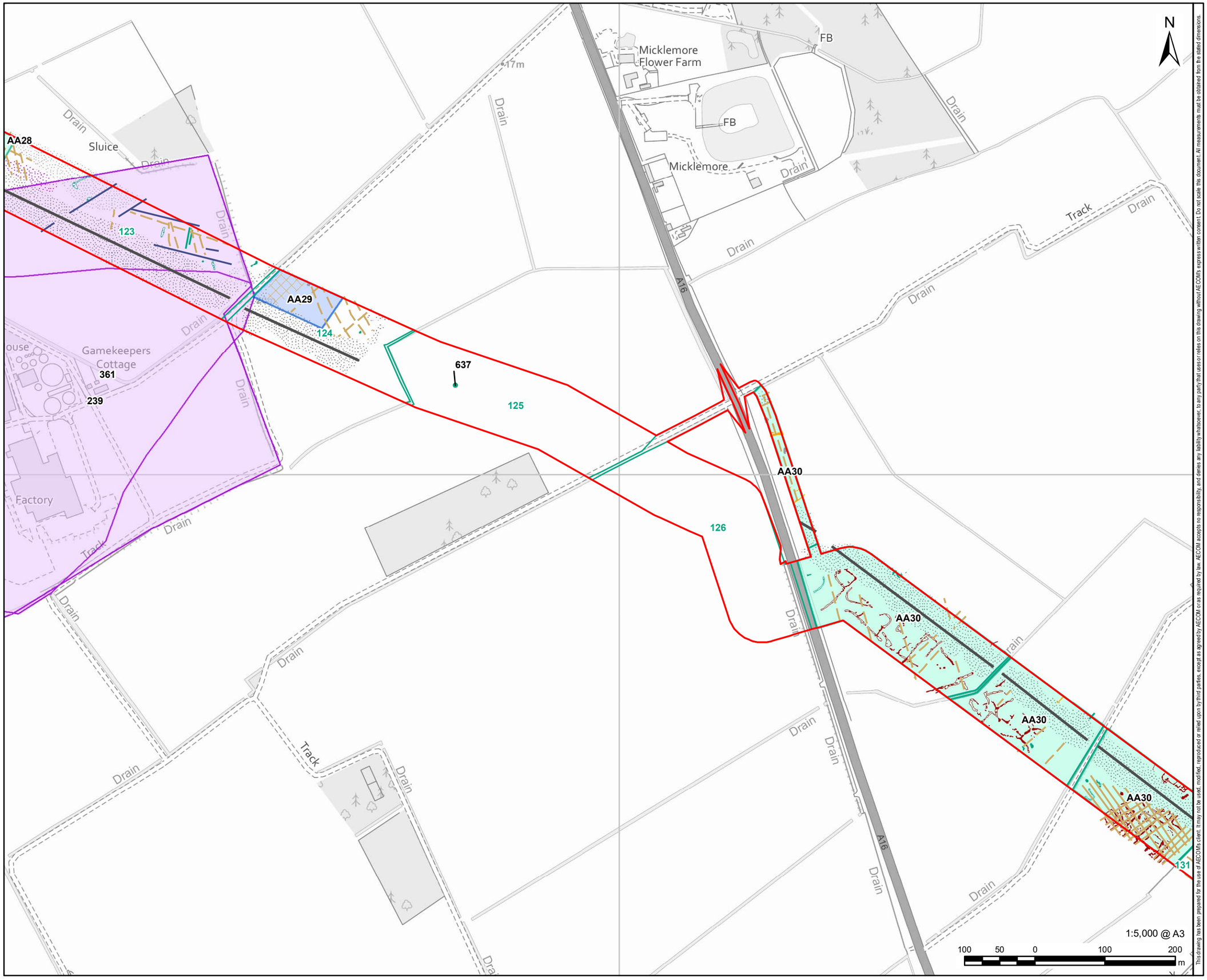

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)
- AMR

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

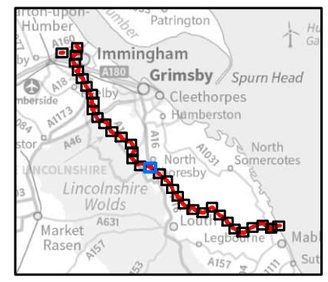

FIGURE TITLE

Figure 2 (18 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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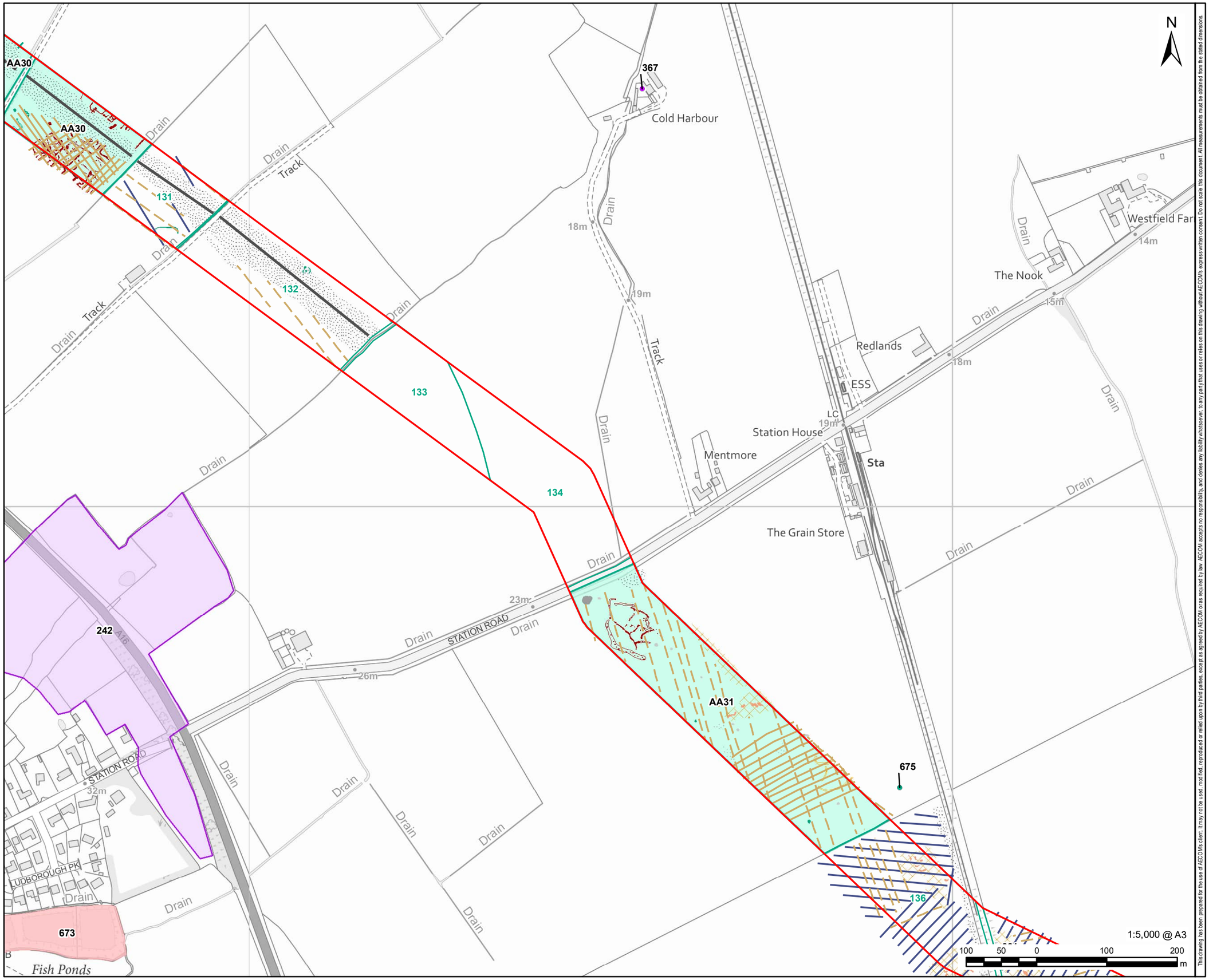


VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset
- Scheduled Monument

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

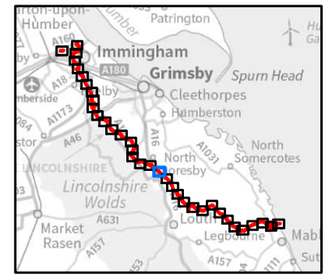


FIGURE TITLE

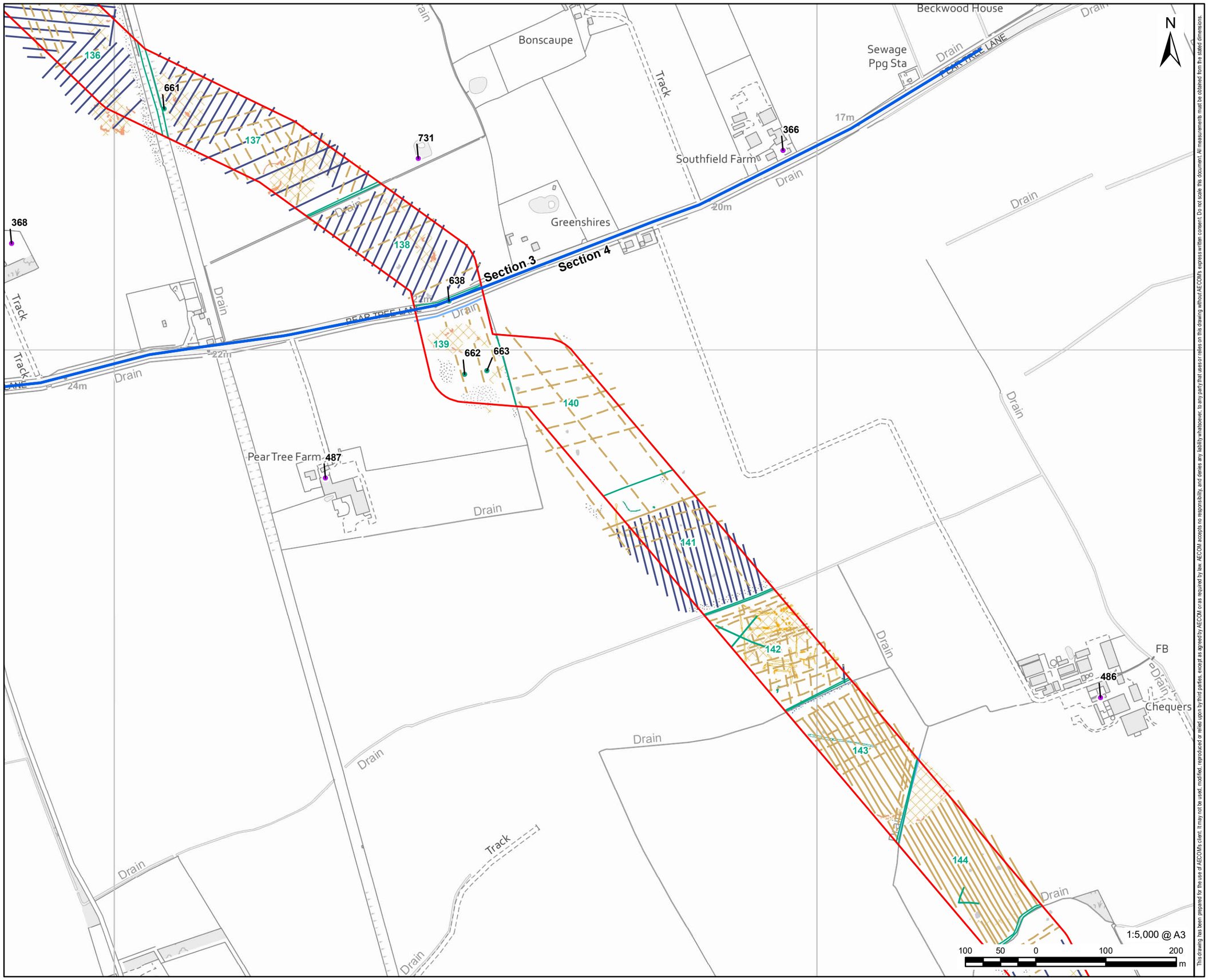
Figure 2 (19 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2



VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Route Section Break
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

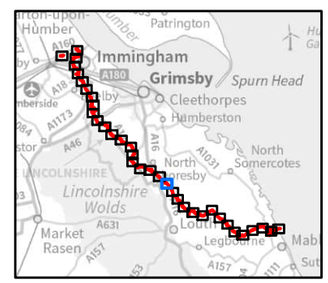


FIGURE TITLE

Figure 2 (20 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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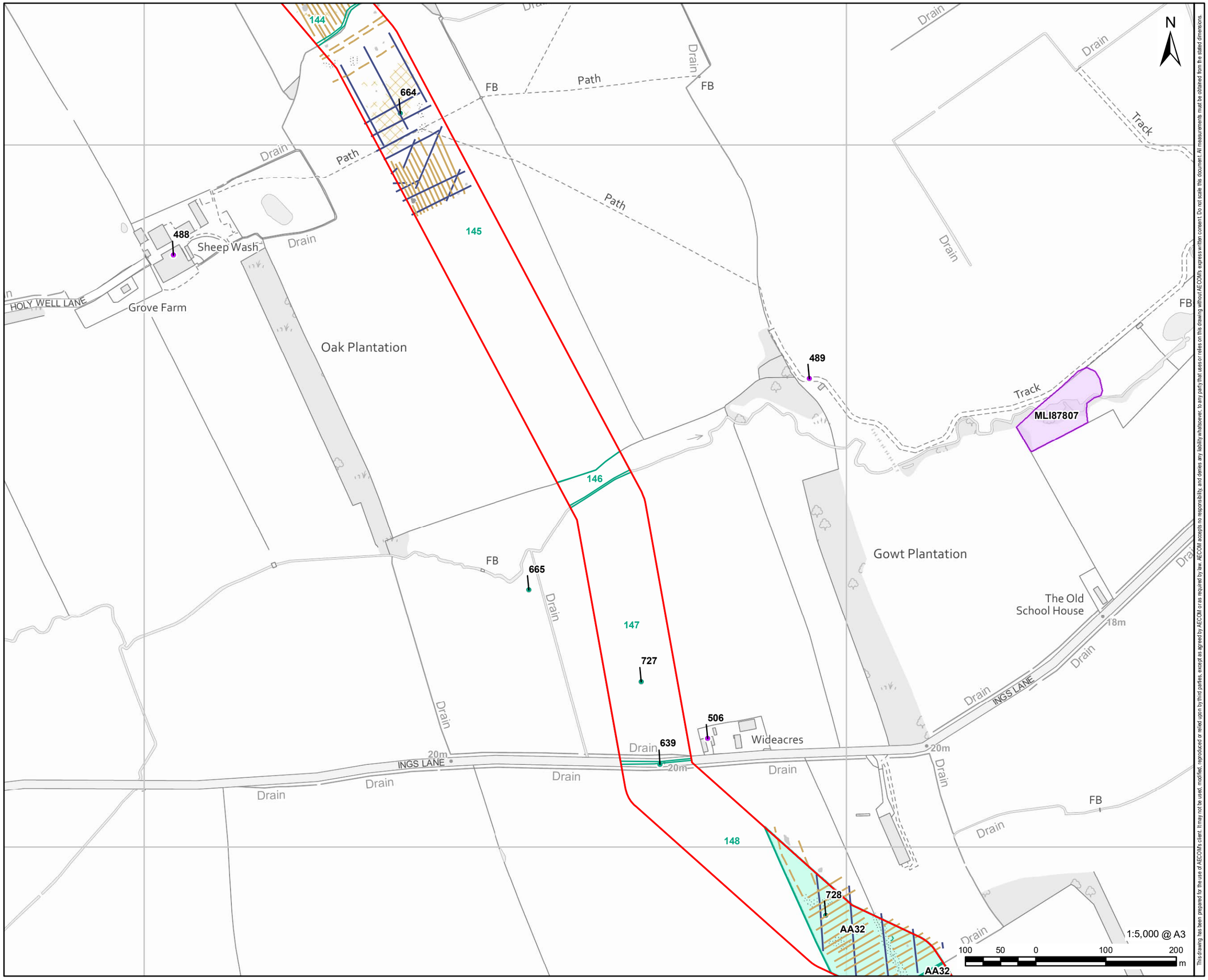

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

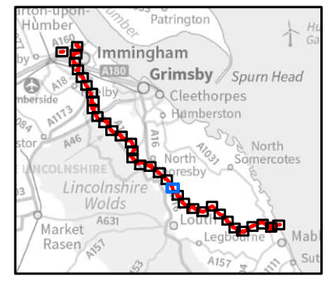

FIGURE TITLE

Figure 2 (21 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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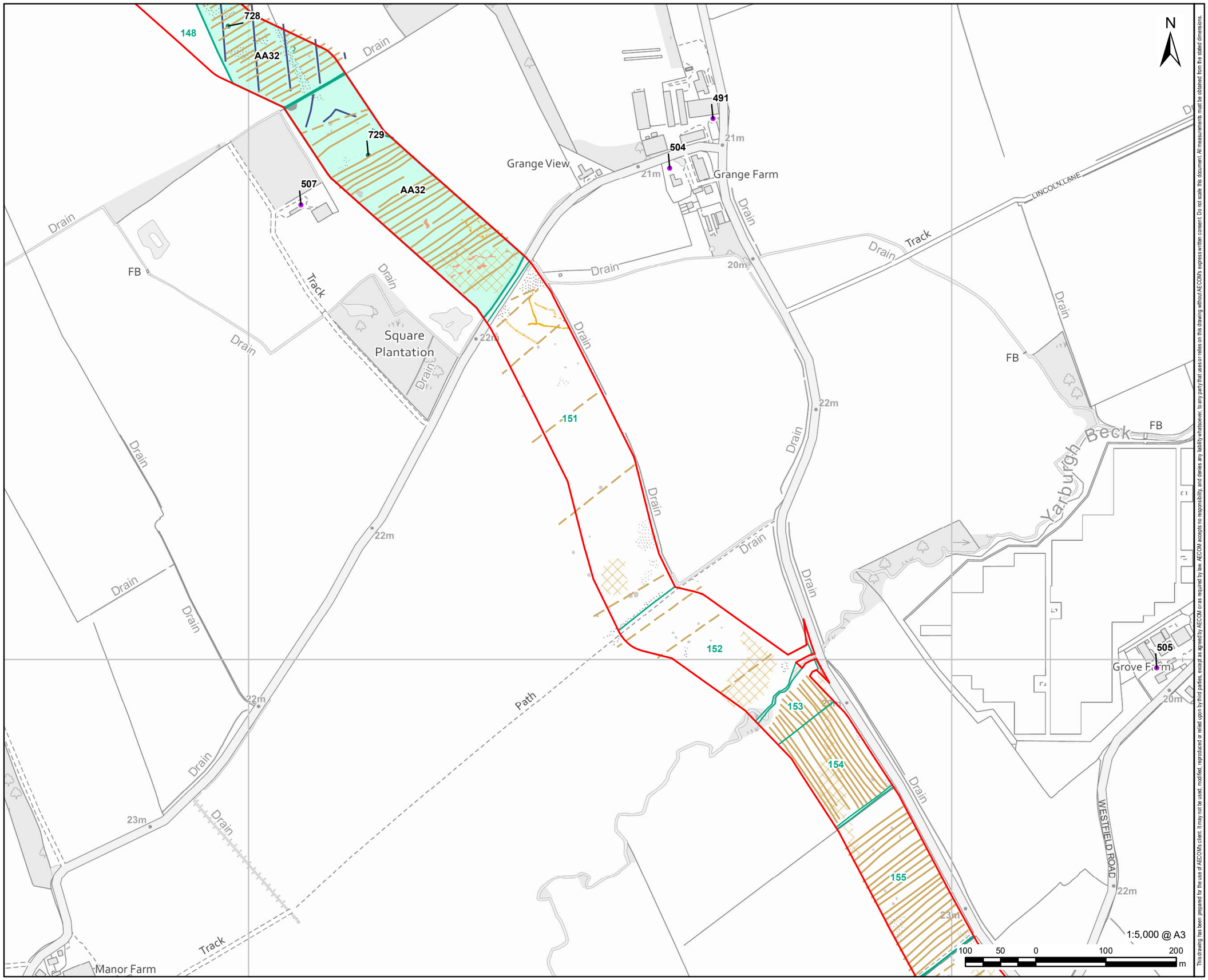


VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

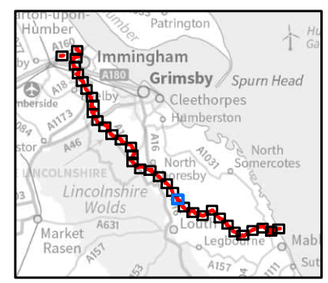


FIGURE TITLE

Figure 2 (22 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

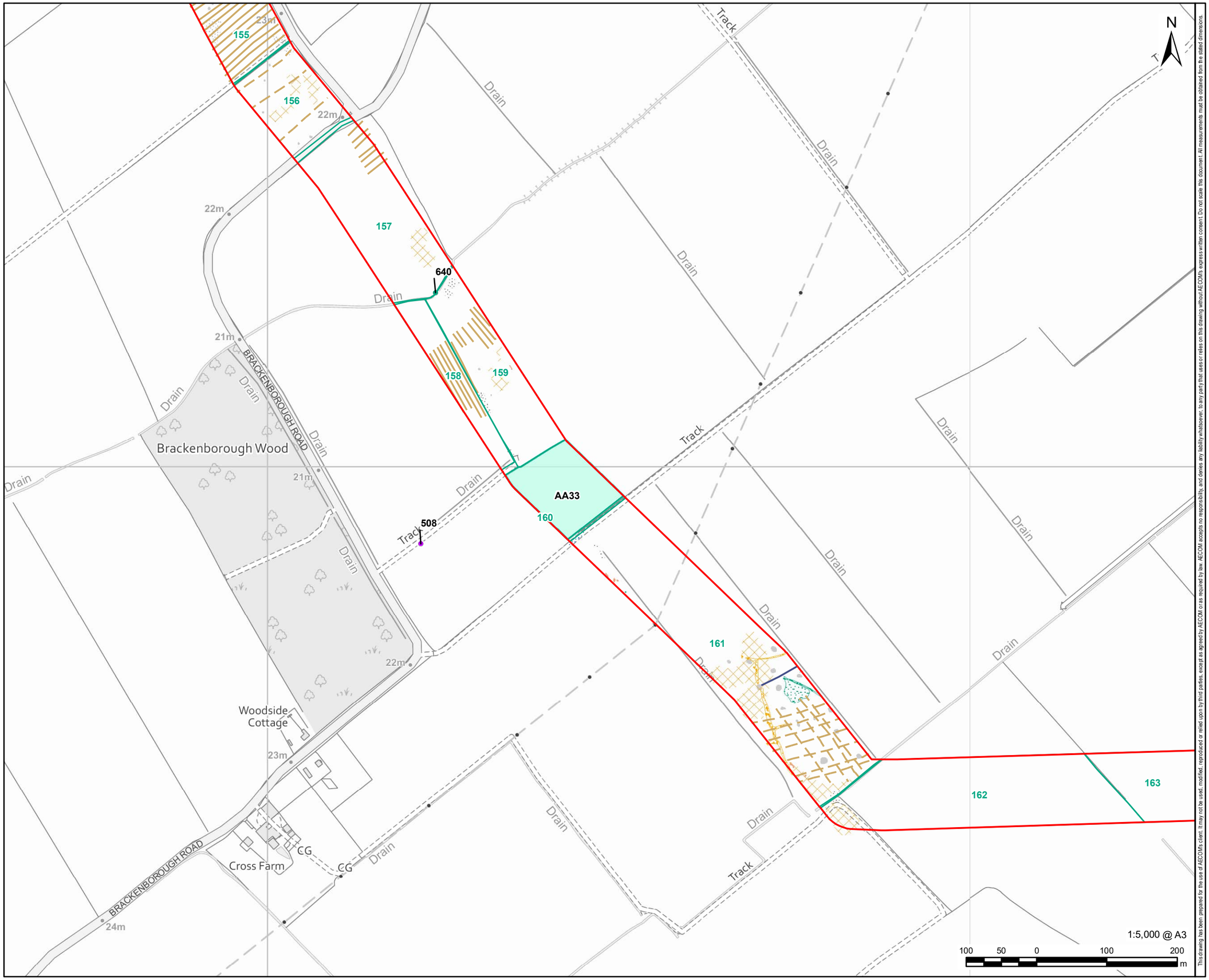
ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

Filename: \\eu.aecomnet.com\EMIA\UK\UKNCL2\Jobs\60668965 V_Net_Zero_Project\900_CAD_GIS\920_GIS\02_Maps\Arch Mitigation Strategy\VCCS_AMS_2_Provisional_Archaeological_Action_Areas_Detailed_v4_240918.mxd



VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

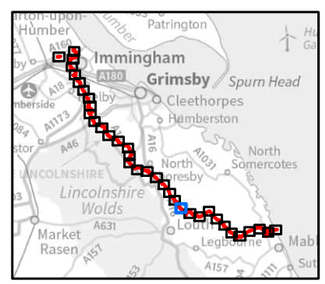


FIGURE TITLE

Figure 2 (23 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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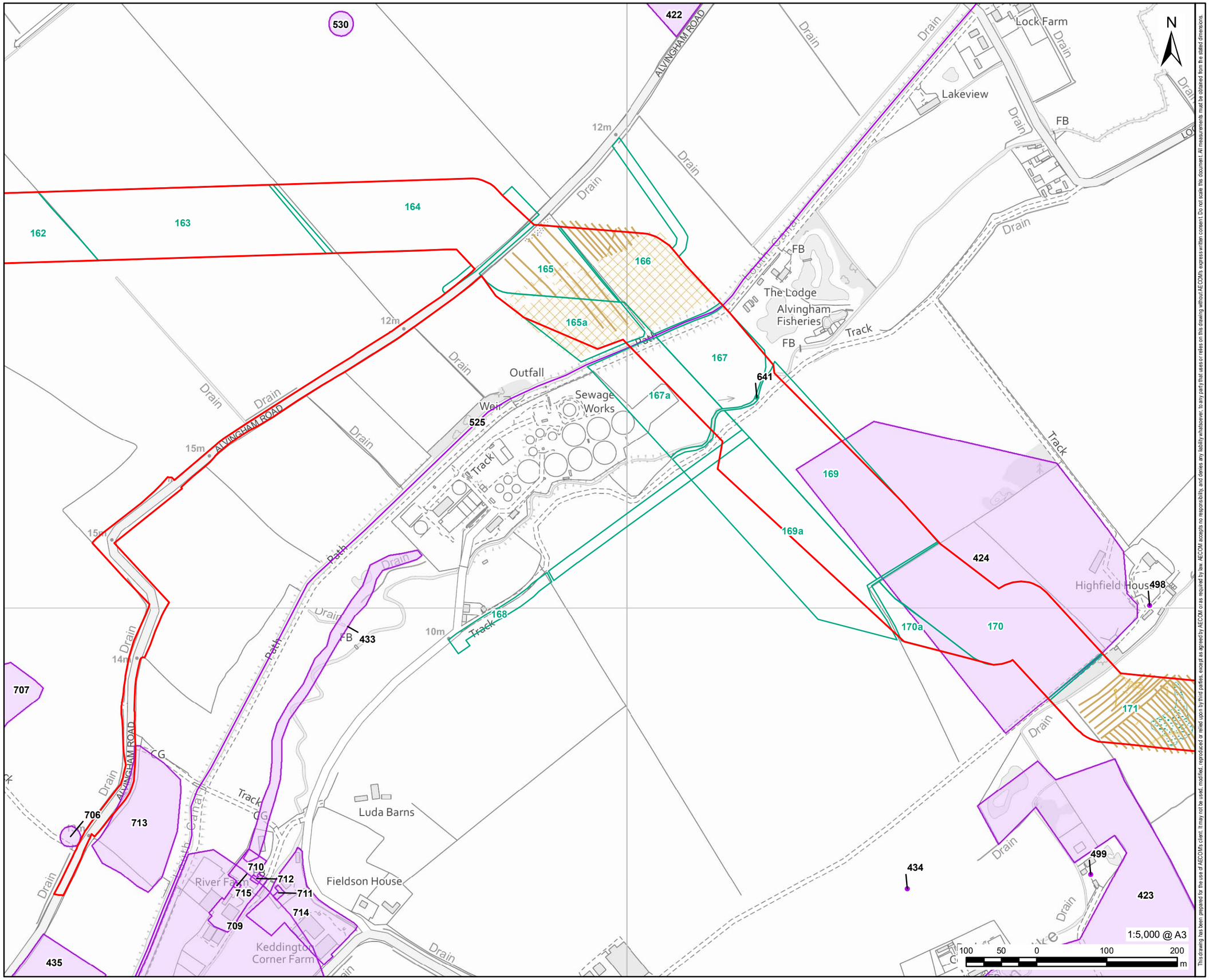

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

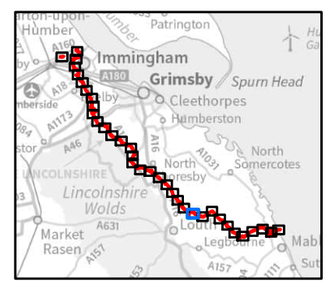

FIGURE TITLE

Figure 2 (24 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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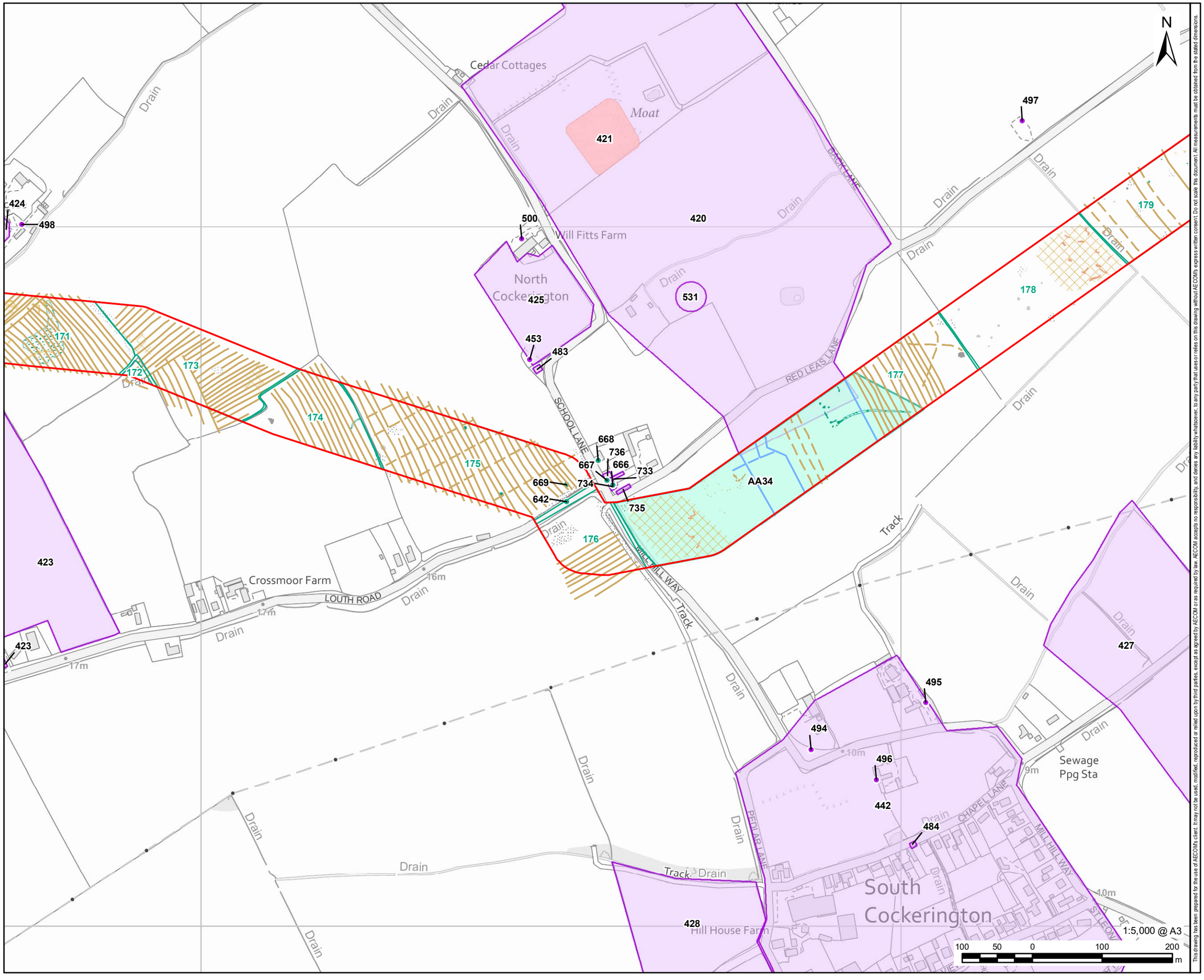

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset
- Scheduled Monument
- Provisional Archaeological Action Area (Type)
- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

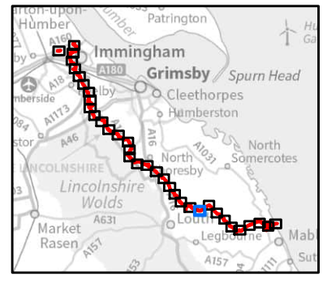

FIGURE TITLE

Figure 2 (25 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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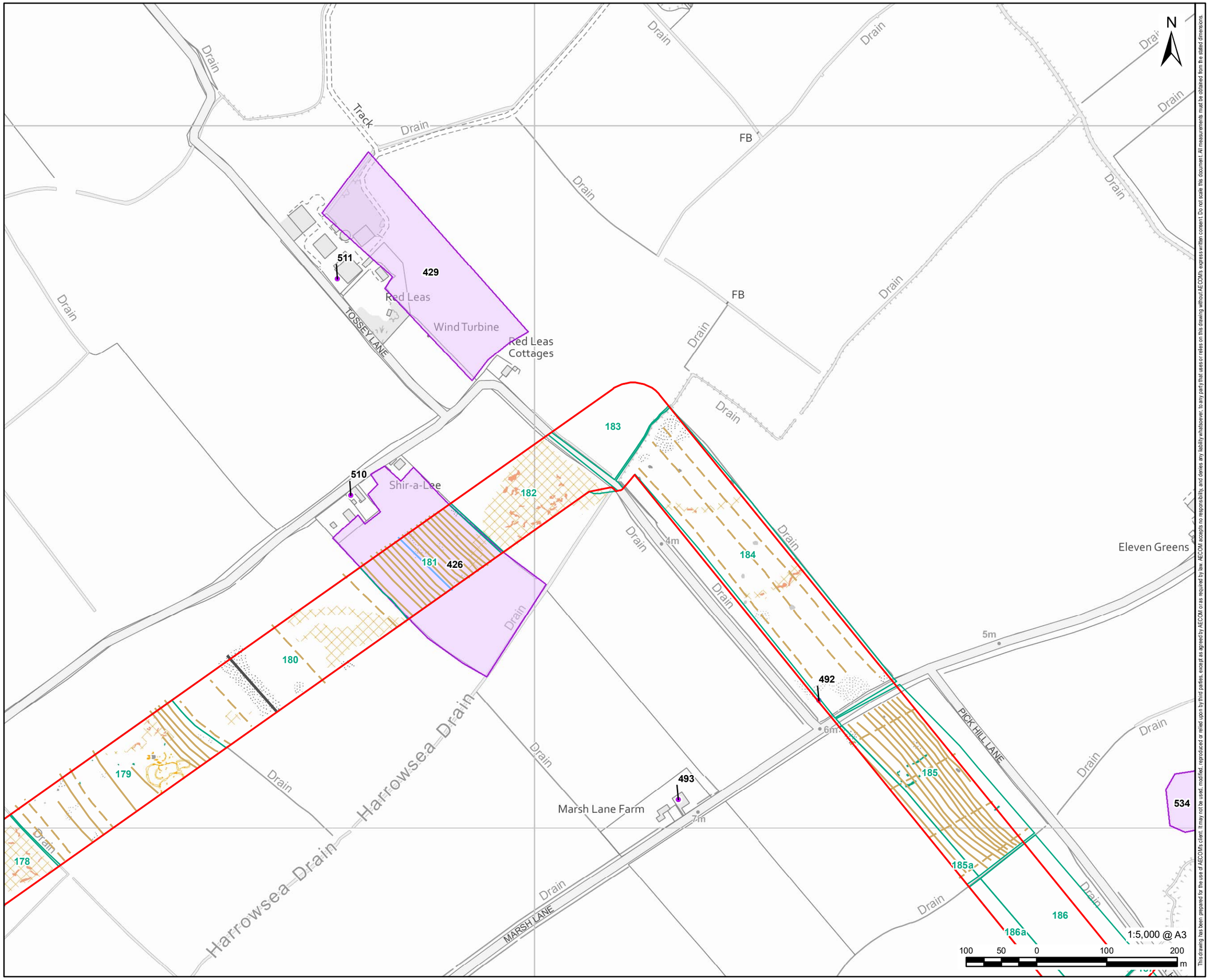

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

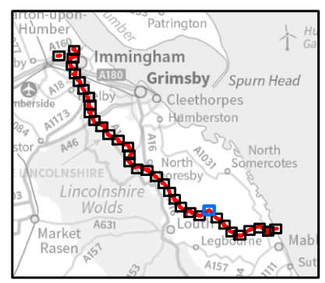

FIGURE TITLE

Figure 2 (26 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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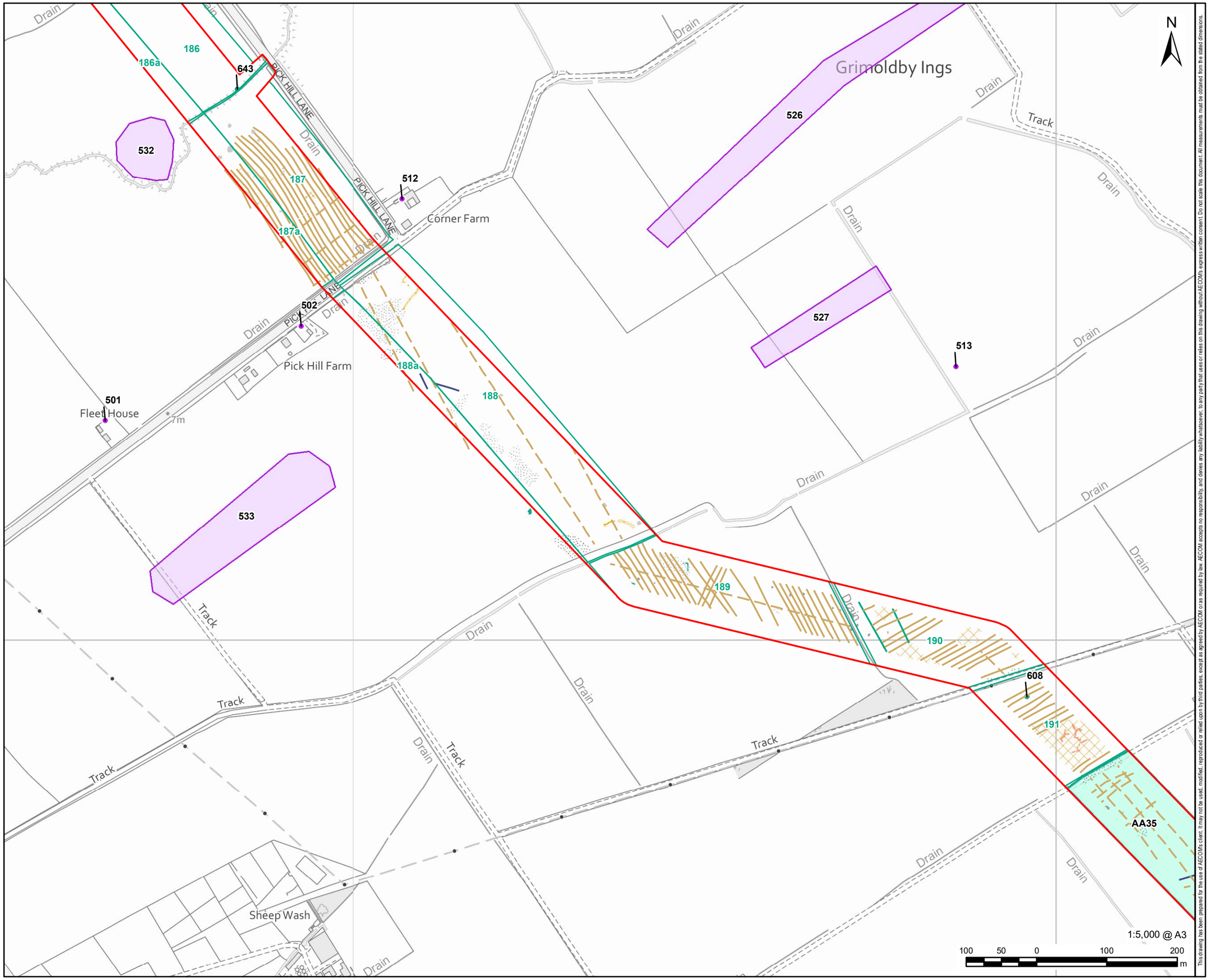

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

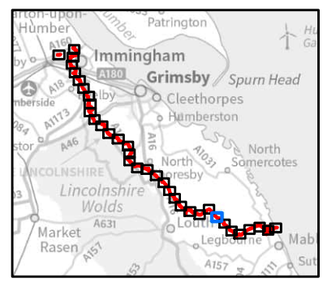

FIGURE TITLE

Figure 2 (27 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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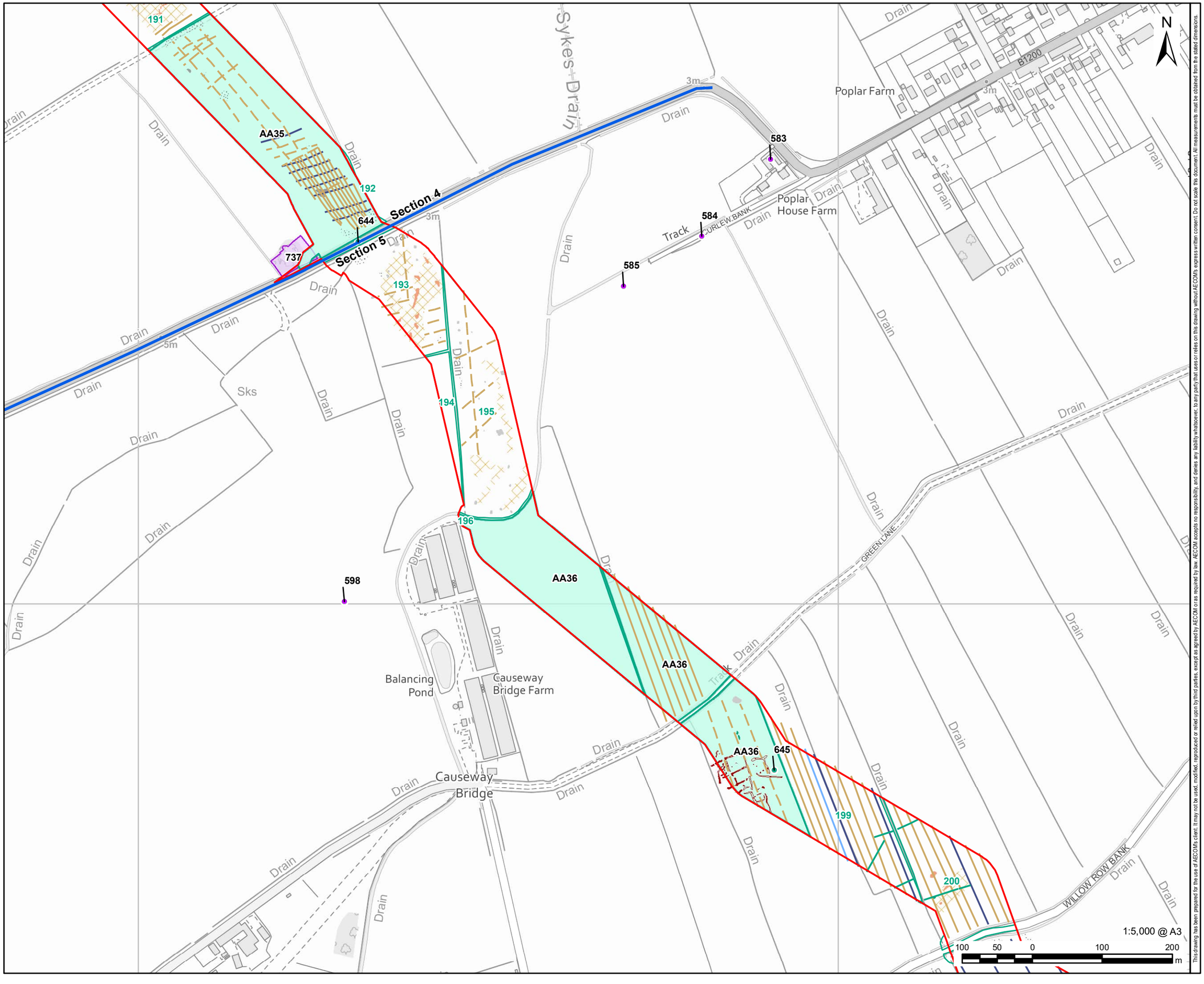


VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Route Section Break
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

Provisional Archaeological Action Area (Type)

- AER (SMS)

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

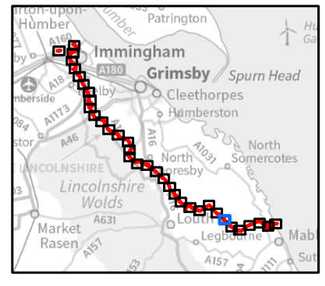


FIGURE TITLE

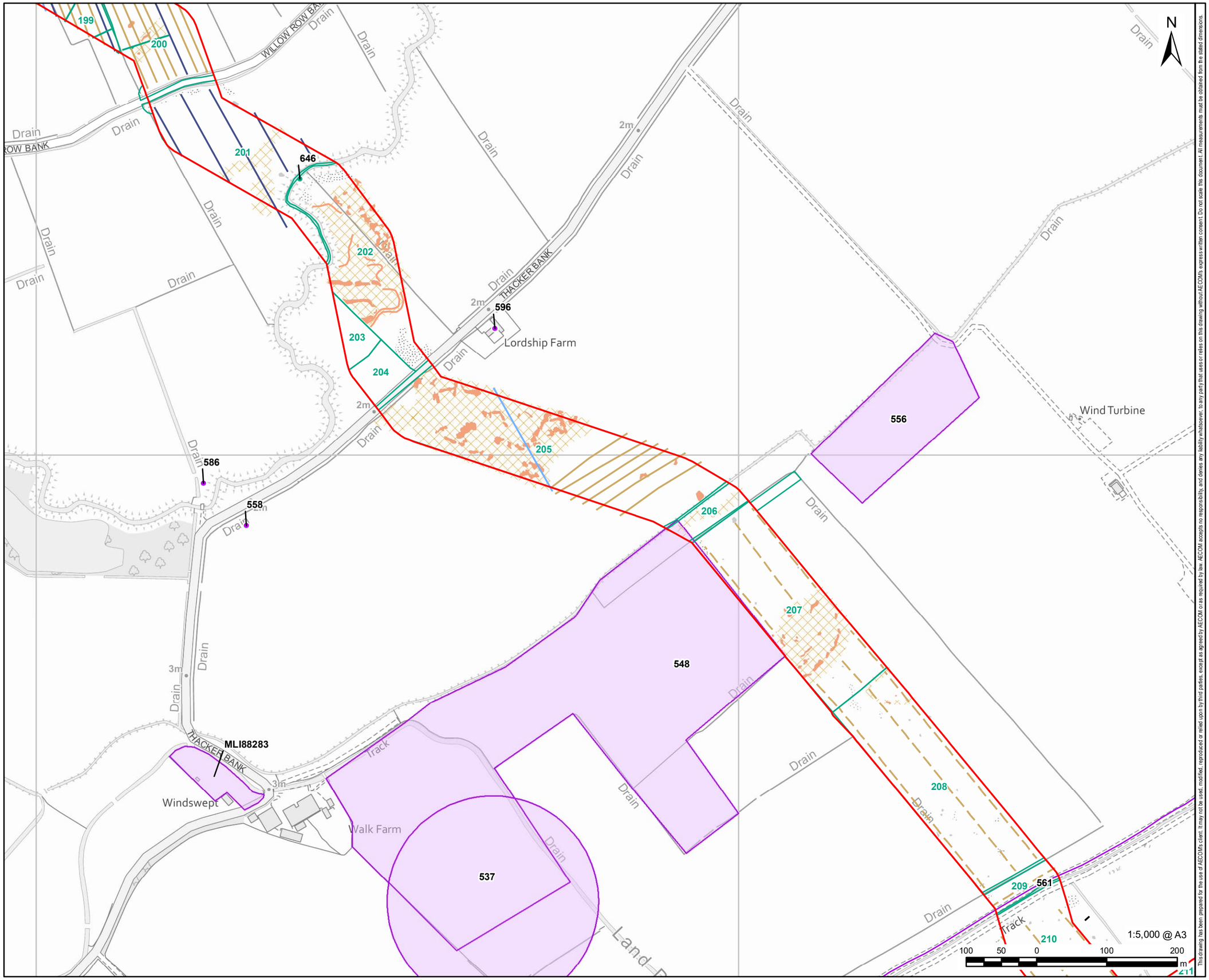
Figure 2 (28 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2



VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

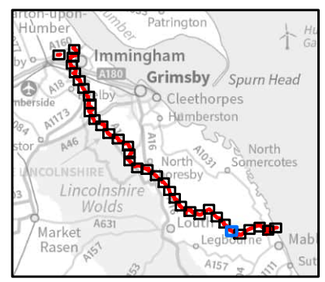


FIGURE TITLE

Figure 2 (29 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Revision: 4 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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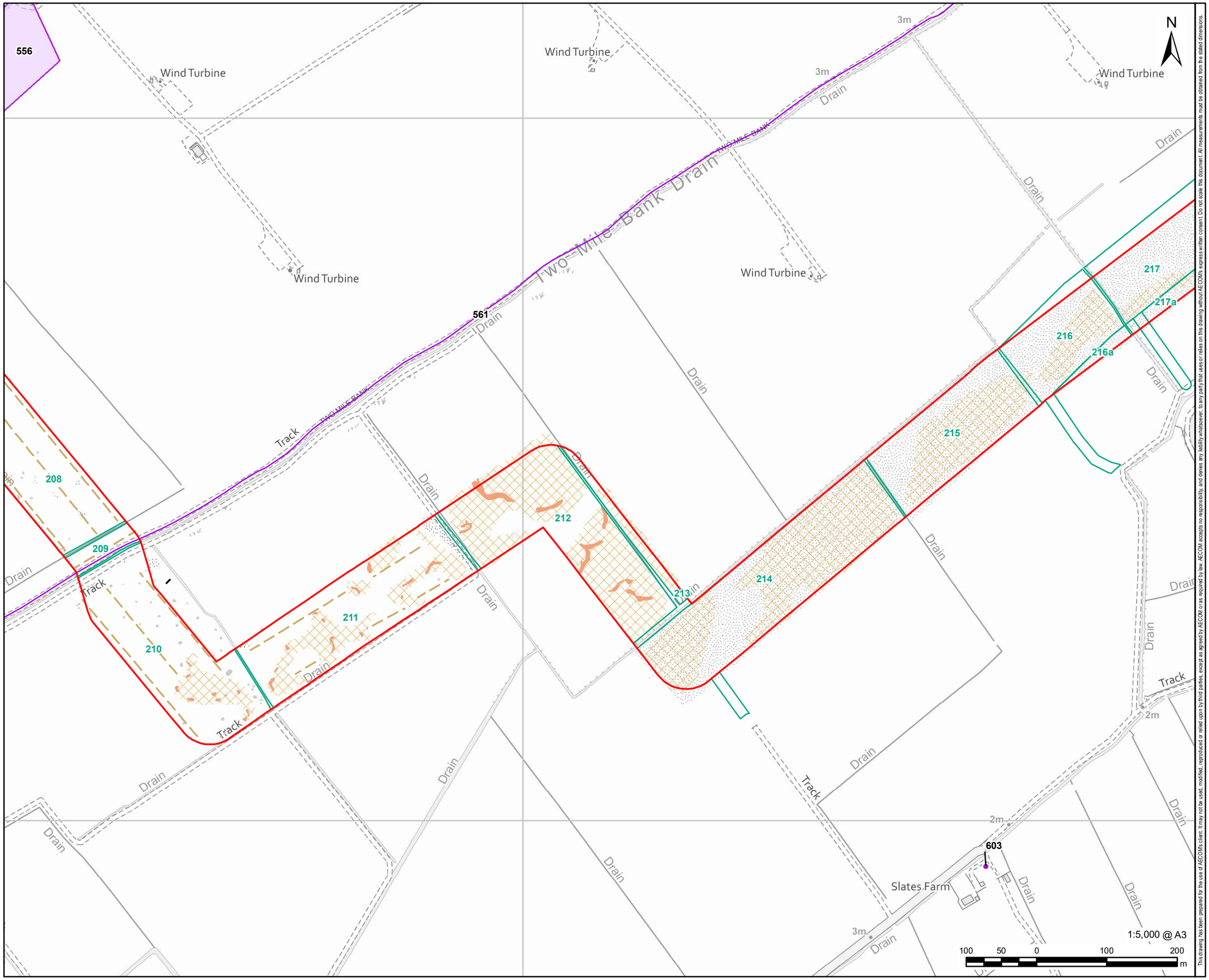

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

Lincolnshire CC HER
North Lincolnshire Council HER
North East Lincolnshire Council HER

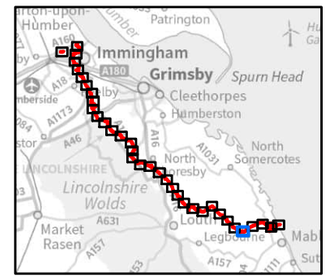

FIGURE TITLE

Figure 2 (30 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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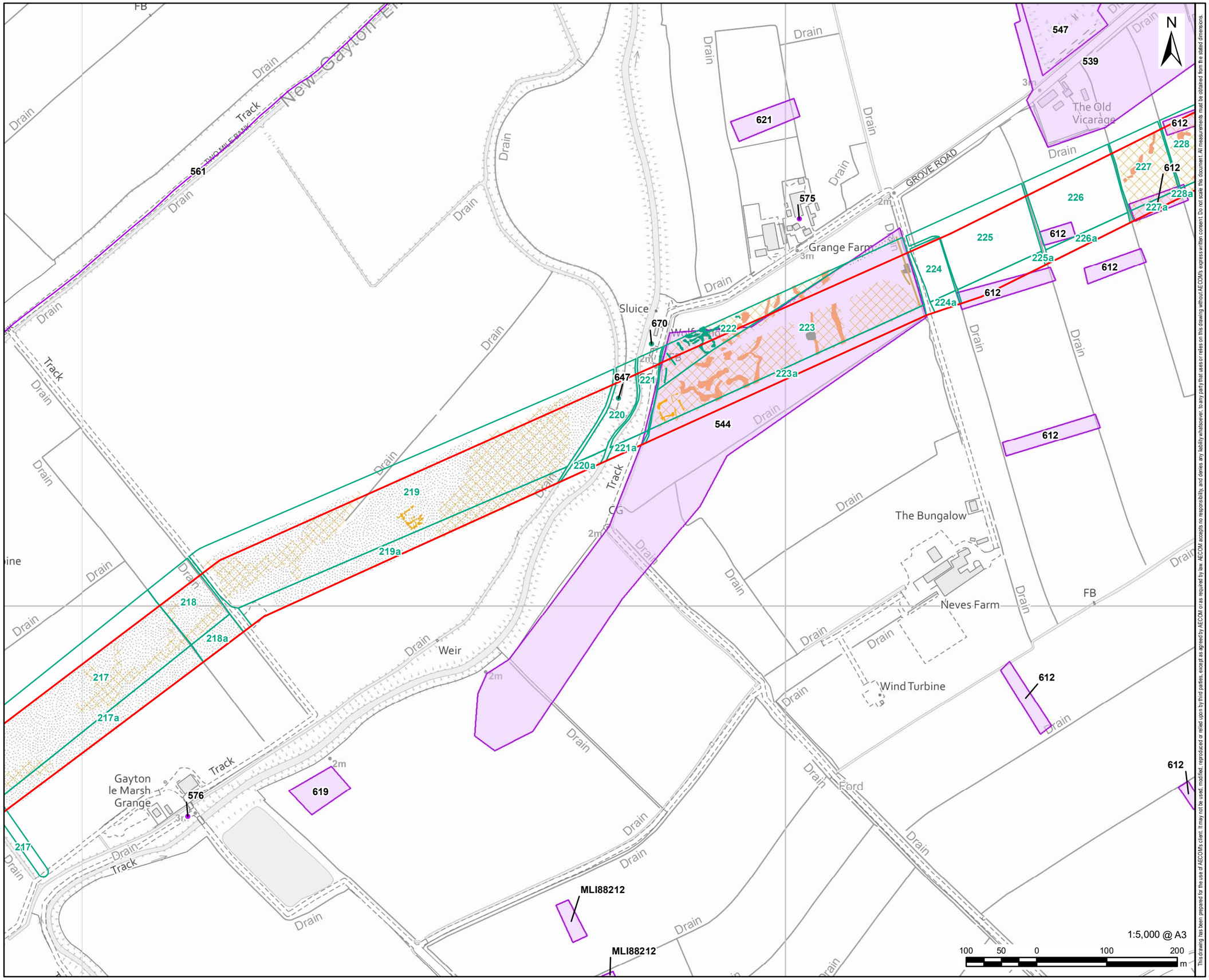

1:5,000 @ A3

100 50 0 100 200 m

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

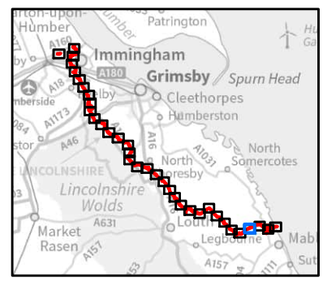

FIGURE TITLE

Figure 2 (31 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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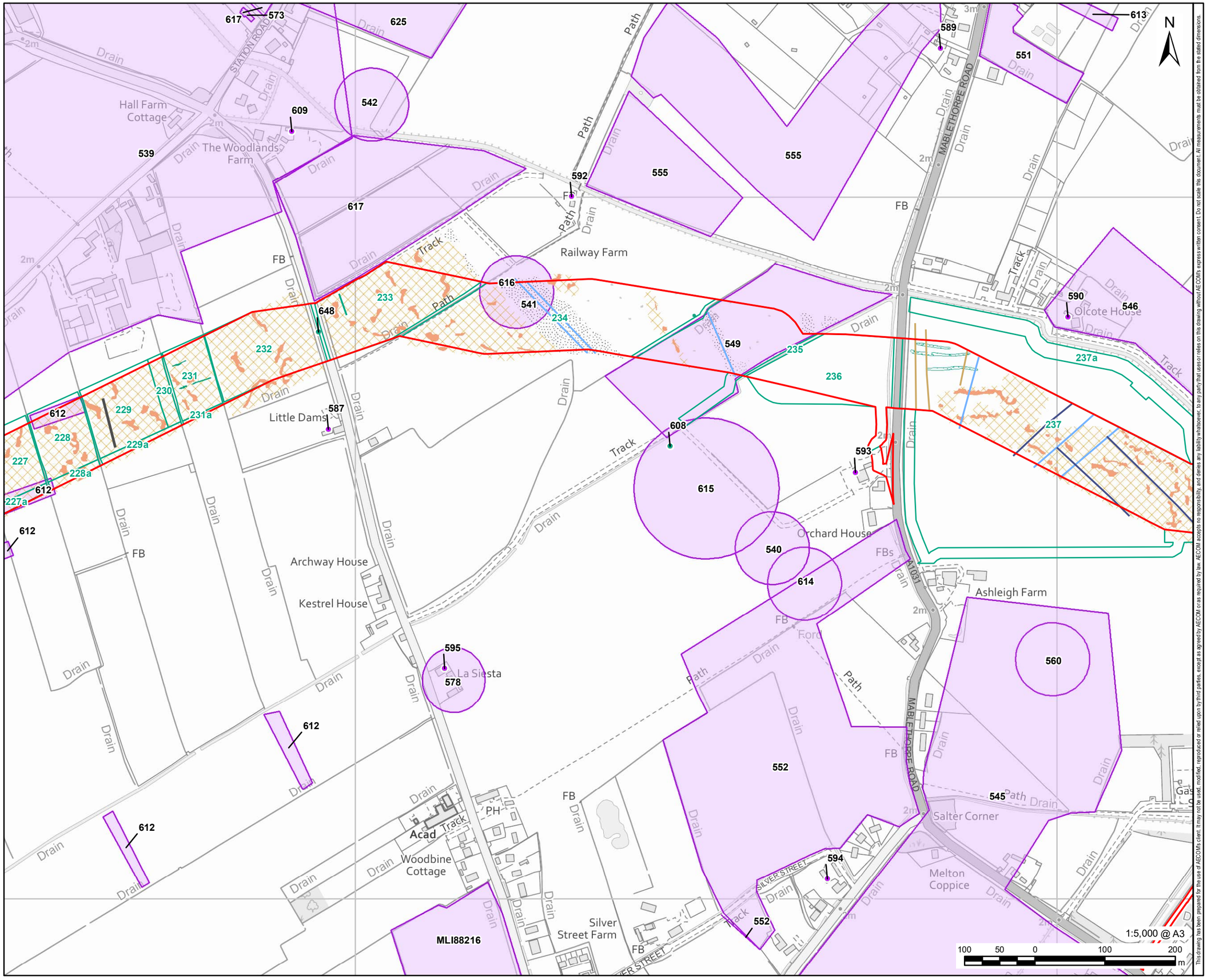

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

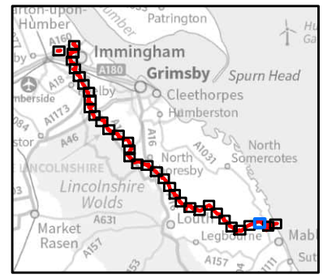

FIGURE TITLE

Figure 2 (32 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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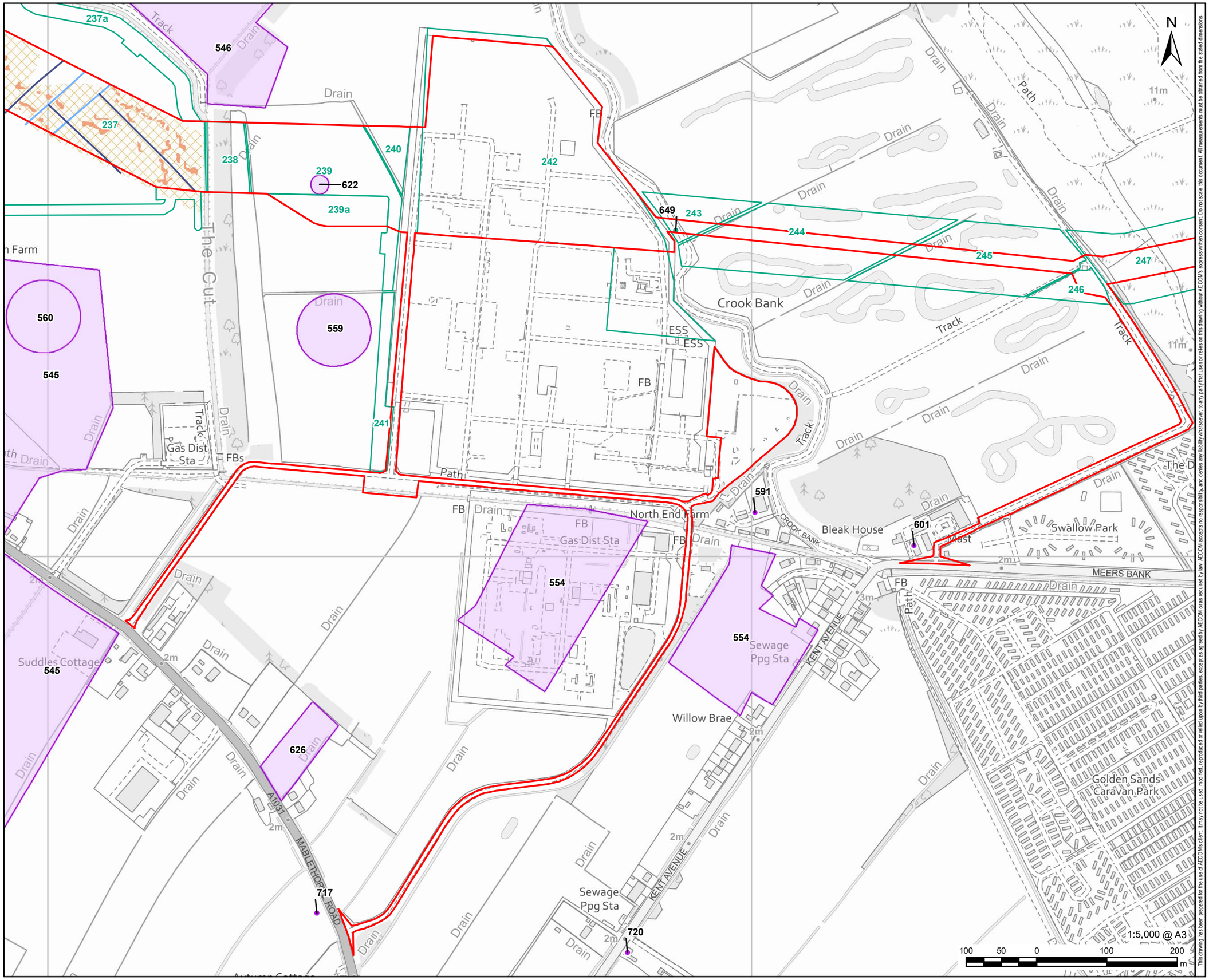

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

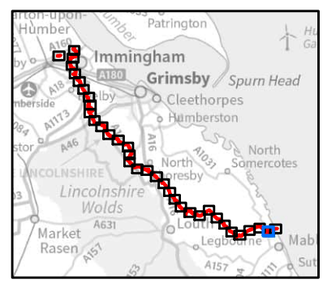

FIGURE TITLE

Figure 2 (33 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

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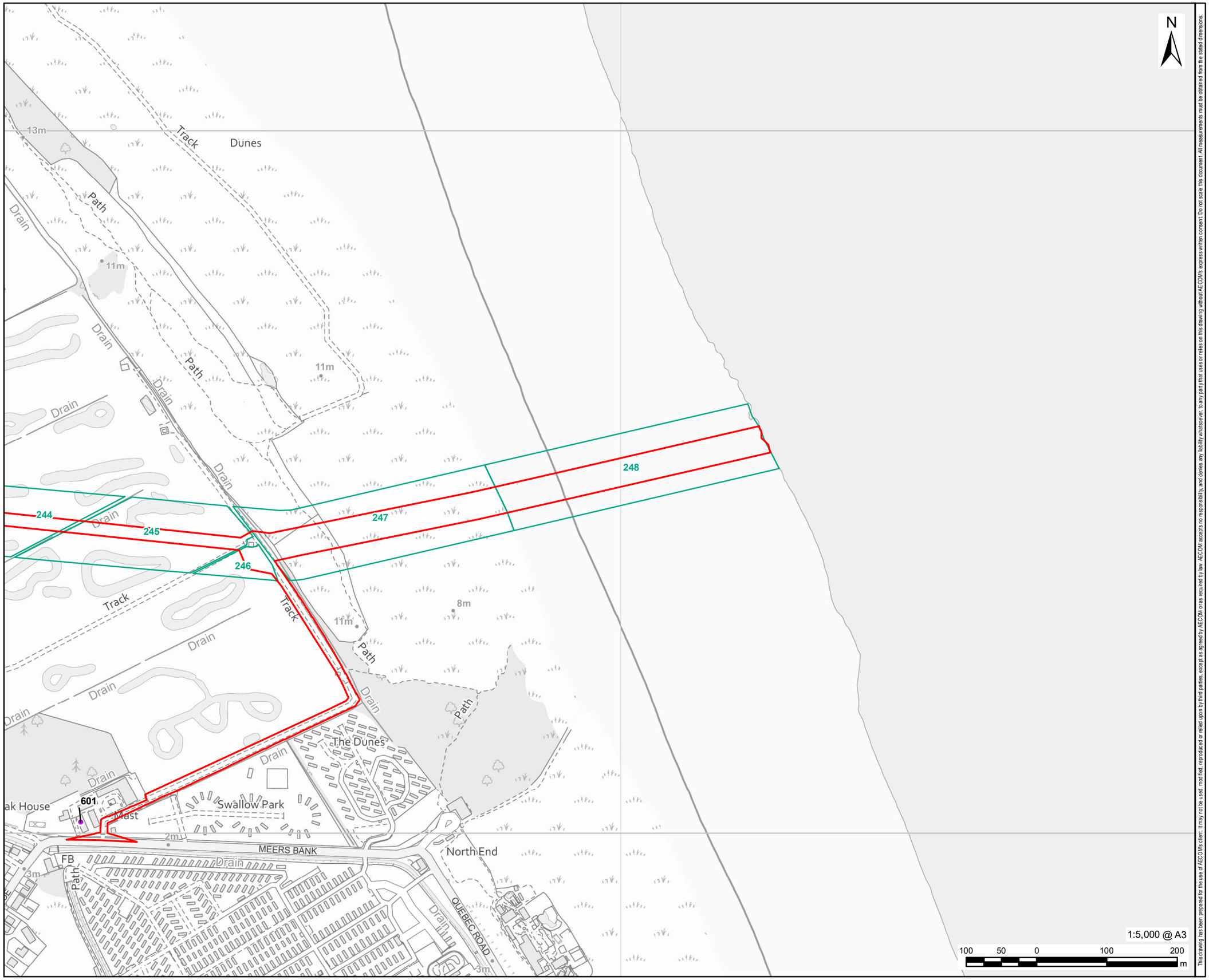


VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

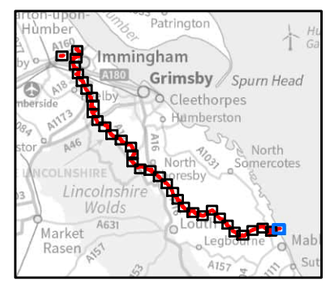


FIGURE TITLE

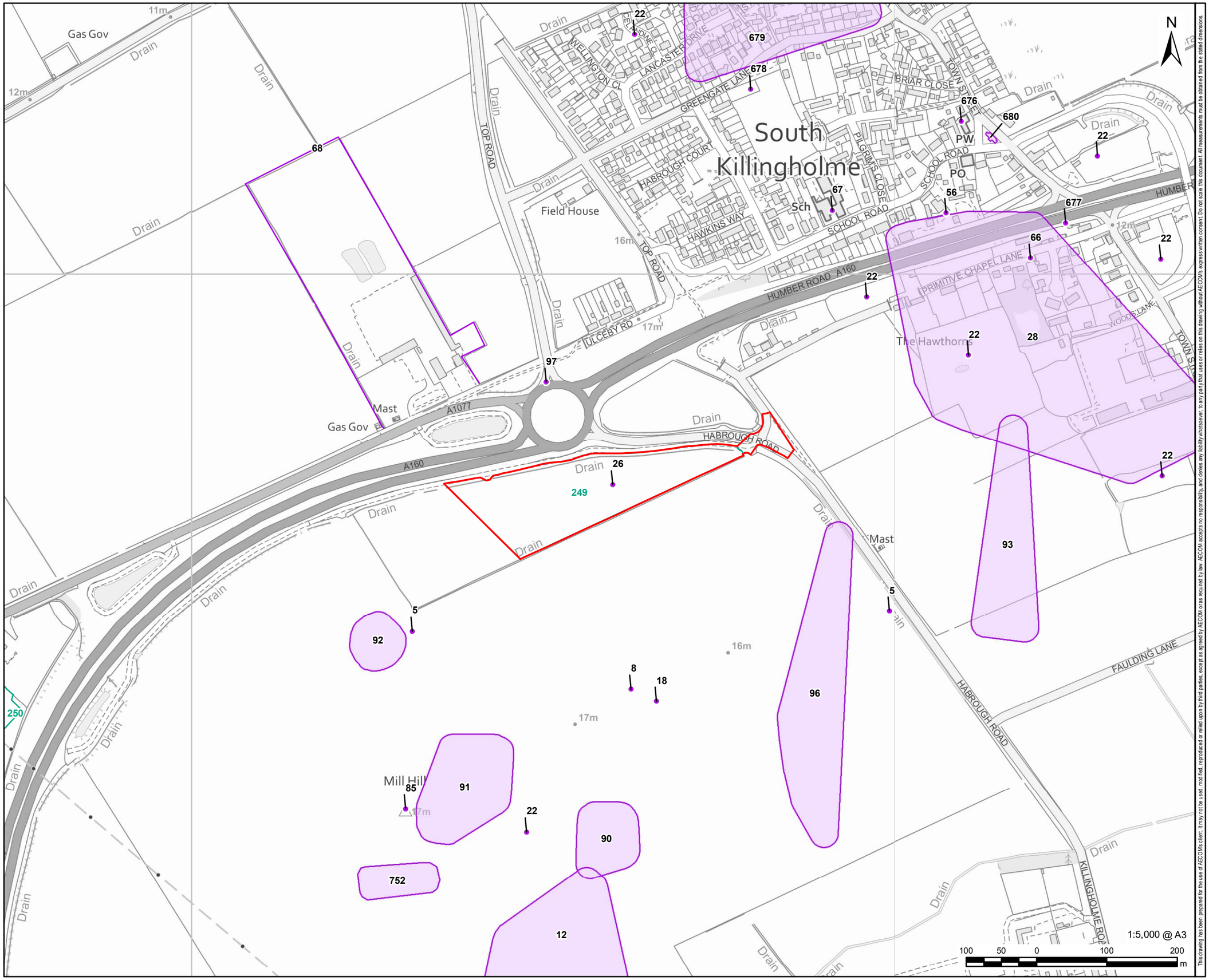
Figure 2 (34 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2



VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area

NOTES:
* HER - Historic Environment Records

Geophysical Survey Interpretation Legend is shown on a separate sheet.

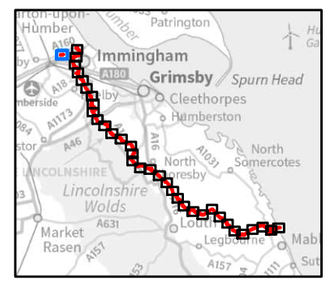


FIGURE TITLE

Figure 2 (35 of 35)
Provisional Archaeological Action Areas - Detailed

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

- DCO Site Boundary
- Route Section Break
- Geophysical Survey Area - AOC Field Numbers
- HER Monument - Point
- HER Monument - Line
- HER Monument - Area
- Additional Non-Designated Asset
- Scheduled Monument

Provisional Archaeological Action Area (Type)

- AER (SMS)
- AER (targeted excavation & SMS)
- AER (targeted excavation)
- AMR
- Provisional action area (approach TBC)

Geophysical Survey Interpretation (AOC)

- Linear Trend (Drainage)
- Linear Trend (Historic Feature)
- Linear Trend (Geology/Natural)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Possible Archaeology)
- Linear Trend (Probable Archaeology)
- Linear Trend (Agricultural, Ridge and Furrow)
- Linear Trend (Ferrous/Iron Spike)
- Linear Trend (Service)
- Linear Trend (Unclear Origin)
- Linear Trend (Magnetic Disturbance)
- Anomaly (Probable Archaeology)
- Spread (Probable Archaeology)
- Anomaly (Possible Archaeology)
- Spread (Possible Archaeology)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Anomaly (Agricultural)
- Spread (Agricultural)
- Anomaly (Geology/Natural)
- Spread (Geology/Natural)
- Anomaly (Ferrous/Iron Spike)
- Spread (Ferrous/Iron Spike)
- Spread (Burned Area)
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Anomaly (Historic Feature)
- Spread (Historic Feature)
- Spread (Custom Use)

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VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

FIGURE TITLE

Figure 2
Provisional Archaeological Action Areas - Geopysical Survey Interpretation Legend

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_2

Figure 3: Completed Trench Locations to ~~01 August~~13 September 2024

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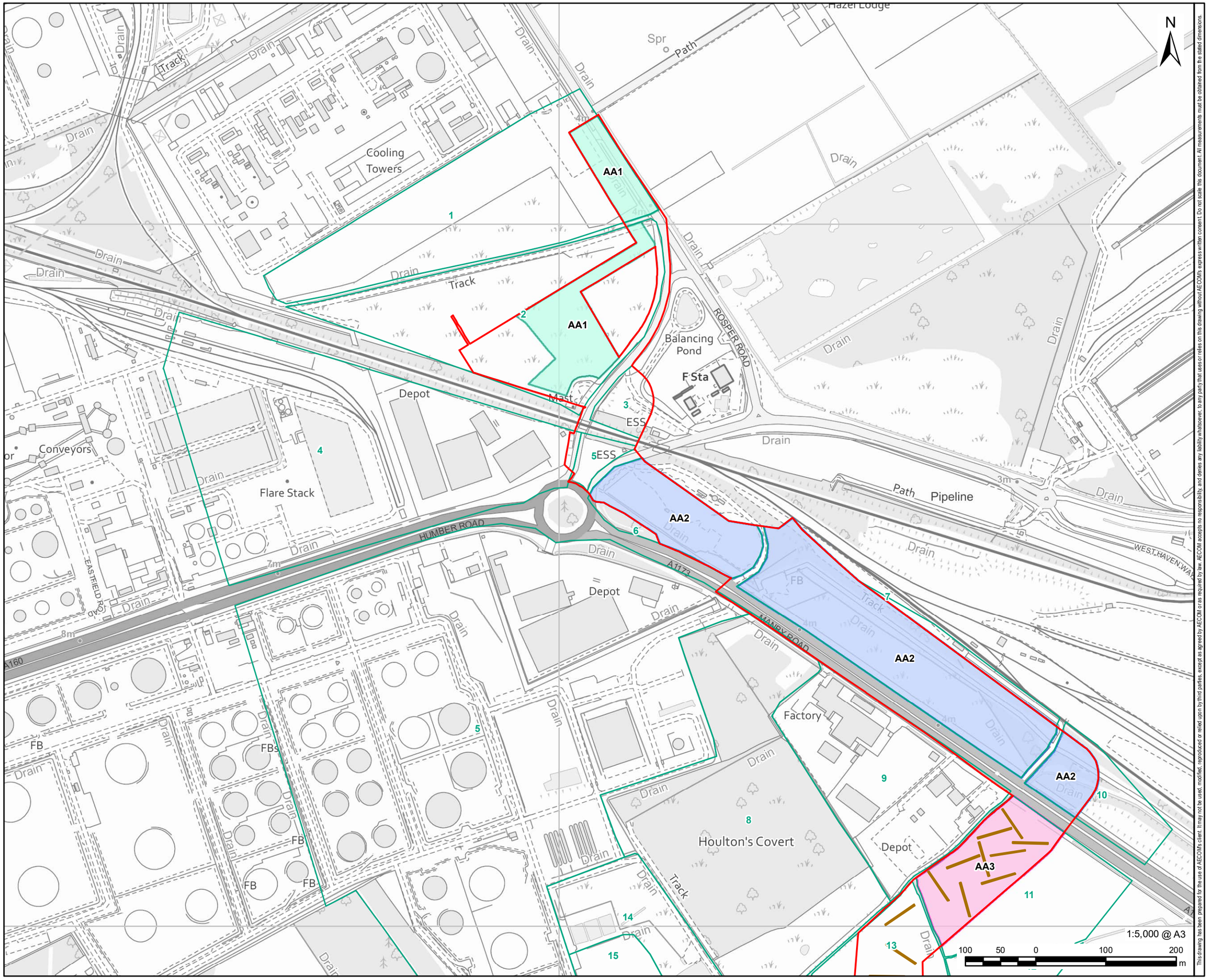

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- Trench Location
  - Planned
- Provisional Archaeological Action Area (Type)
  - AER (SMS)
  - AER (targeted excavation & SMS)
  - AMR

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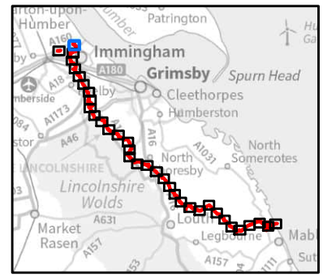

FIGURE TITLE

Figure 3 (1 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_3

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VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

Provisional Archaeological Action Area (Type)

- AER (SMS)
- AER (targeted excavation & SMS)
- AER (targeted excavation)
- AMR

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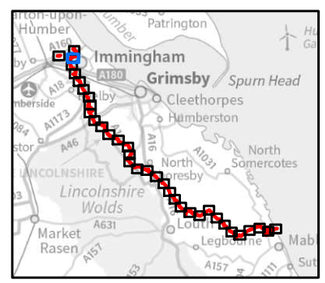

FIGURE TITLE

Figure 3 (2 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_3

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100 50 0 100 200 m

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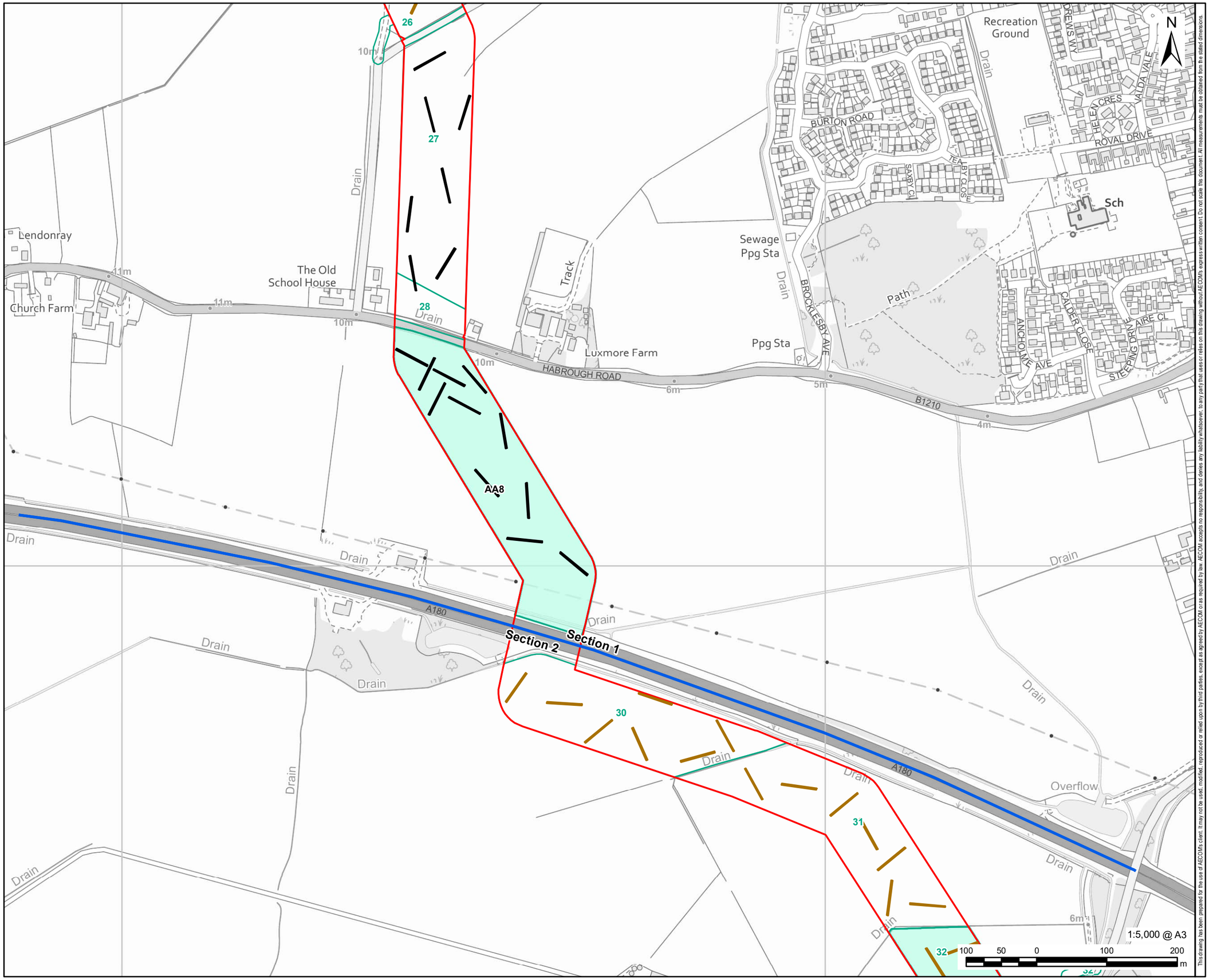

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Route Section Break
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

Provisional Archaeological Action Area (Type)

- AER (SMS)

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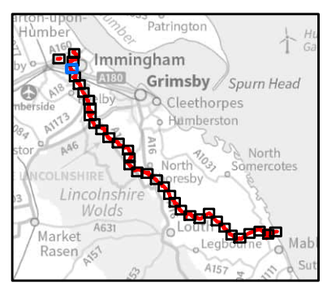

FIGURE TITLE

Figure 3 (3 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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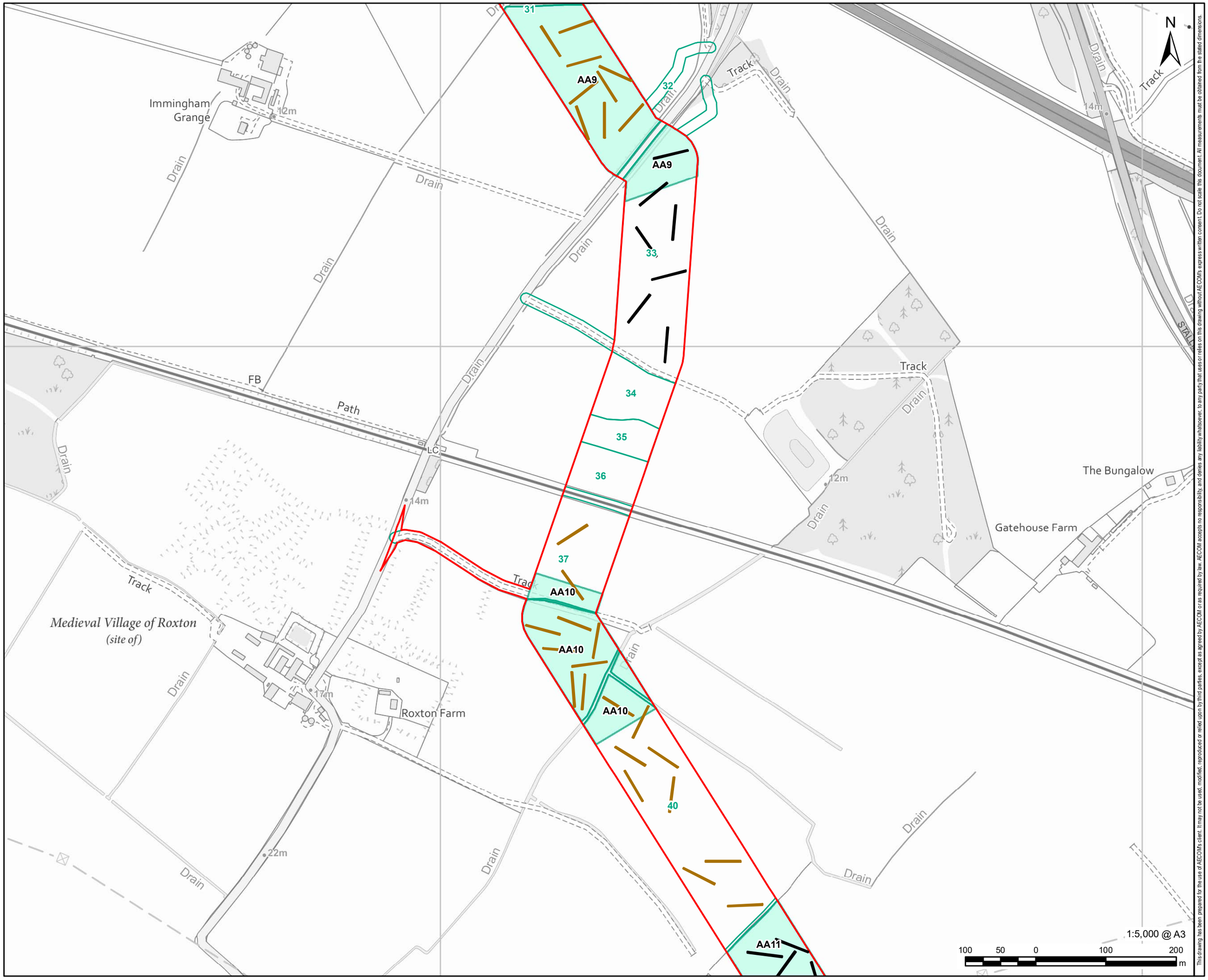

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

Provisional Archaeological Action Area (Type)

- AER (SMS)

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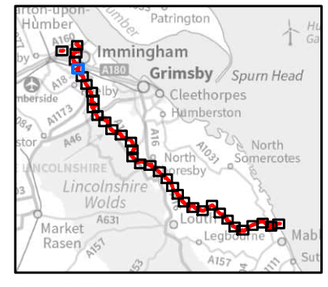

FIGURE TITLE

Figure 3 (4 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_3

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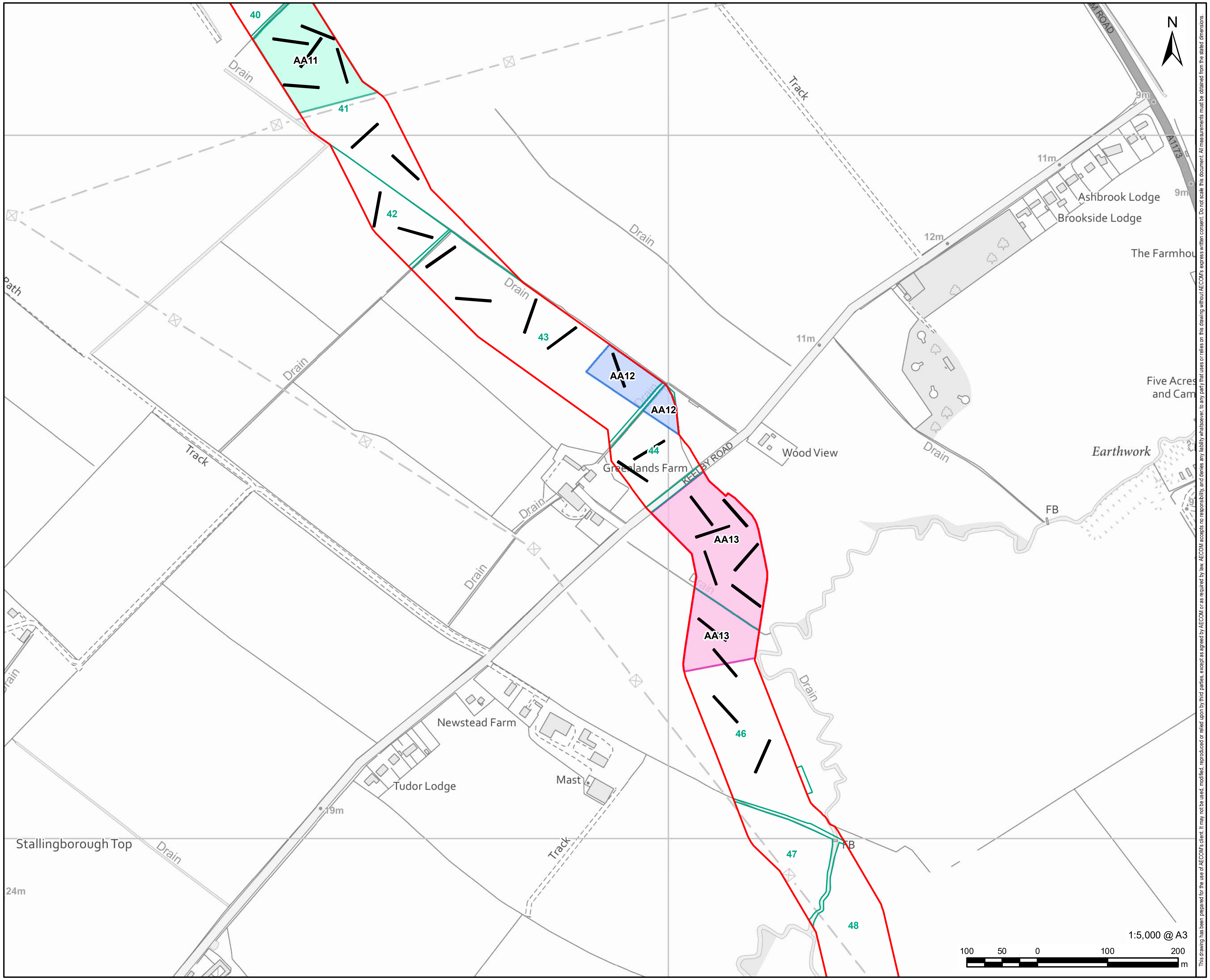

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VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

DCO Site Boundary

Geophysical Survey Area - AOC Field Numbers

Trench Location

Excavated

Provisional Archaeological Action Area (Type)

AER (SMS)

AER (targeted excavation & SMS)

AMR

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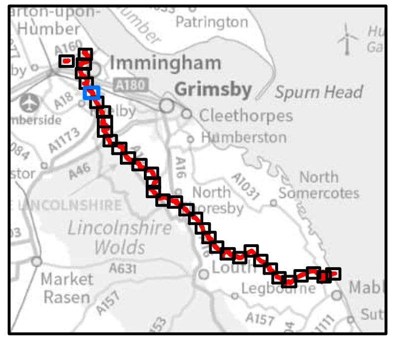

FIGURE TITLE

Figure 3 (5 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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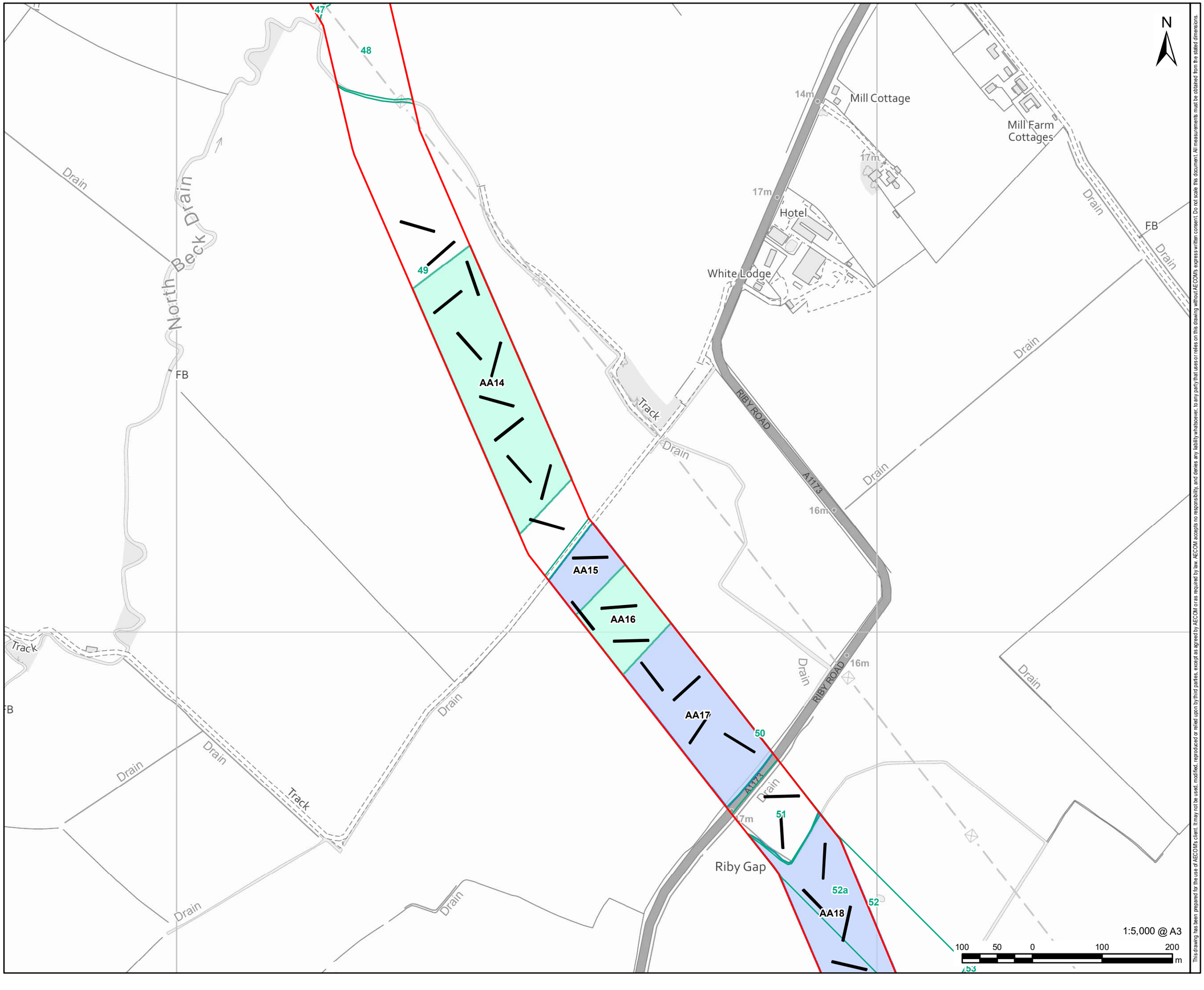

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated

Provisional Archaeological Action Area (Type)

- AER (SMS)
- AMR

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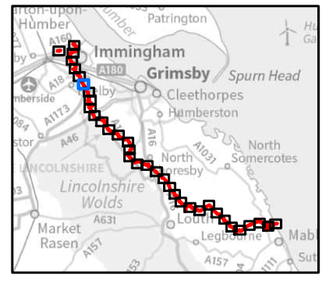

FIGURE TITLE

Figure 3 (6 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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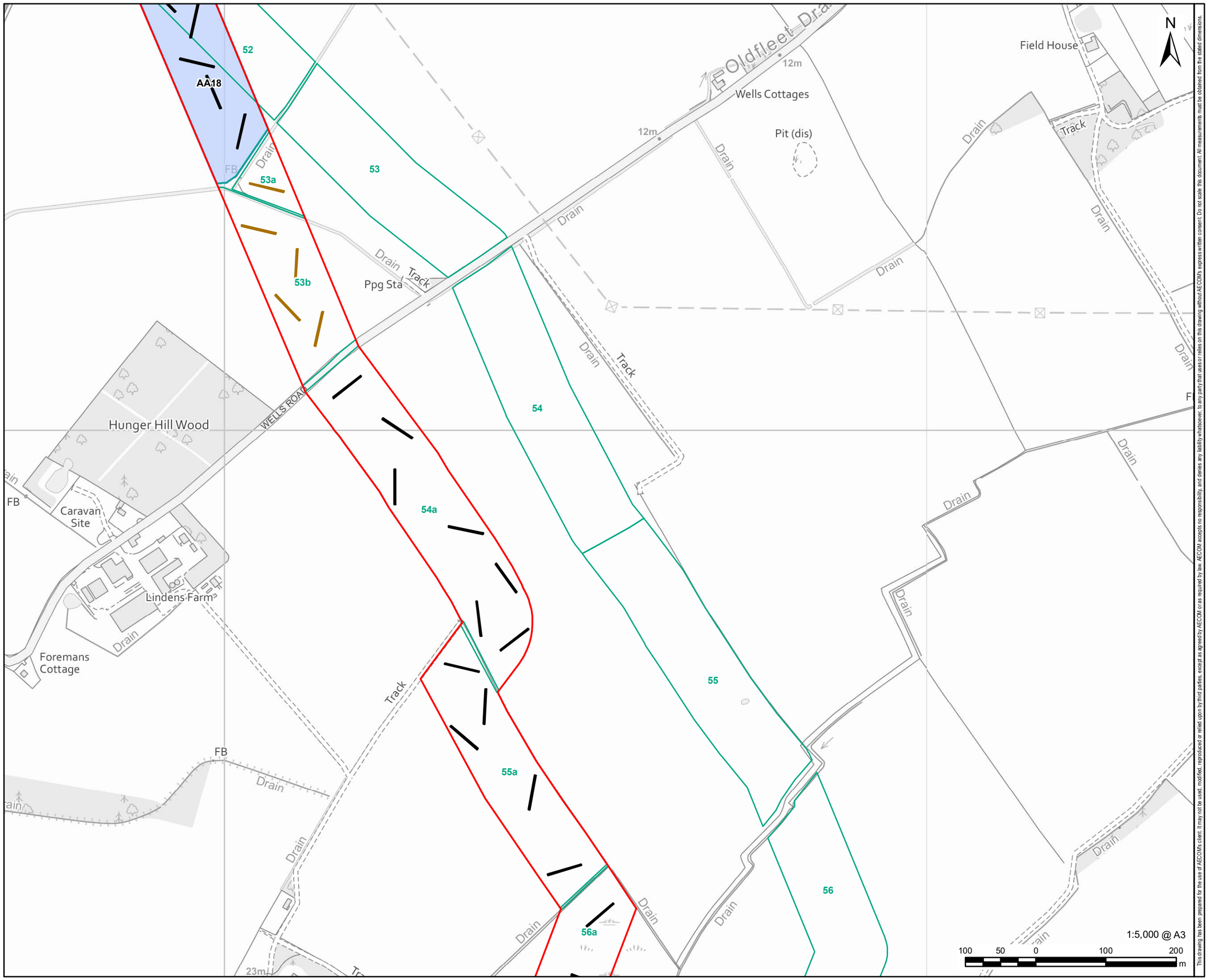

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

Provisional Archaeological Action Area (Type)

- AMR

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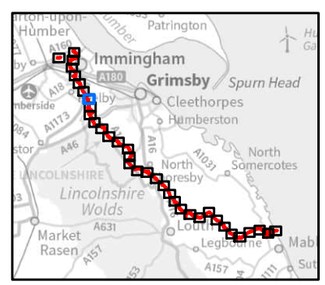

FIGURE TITLE

Figure 3 (7 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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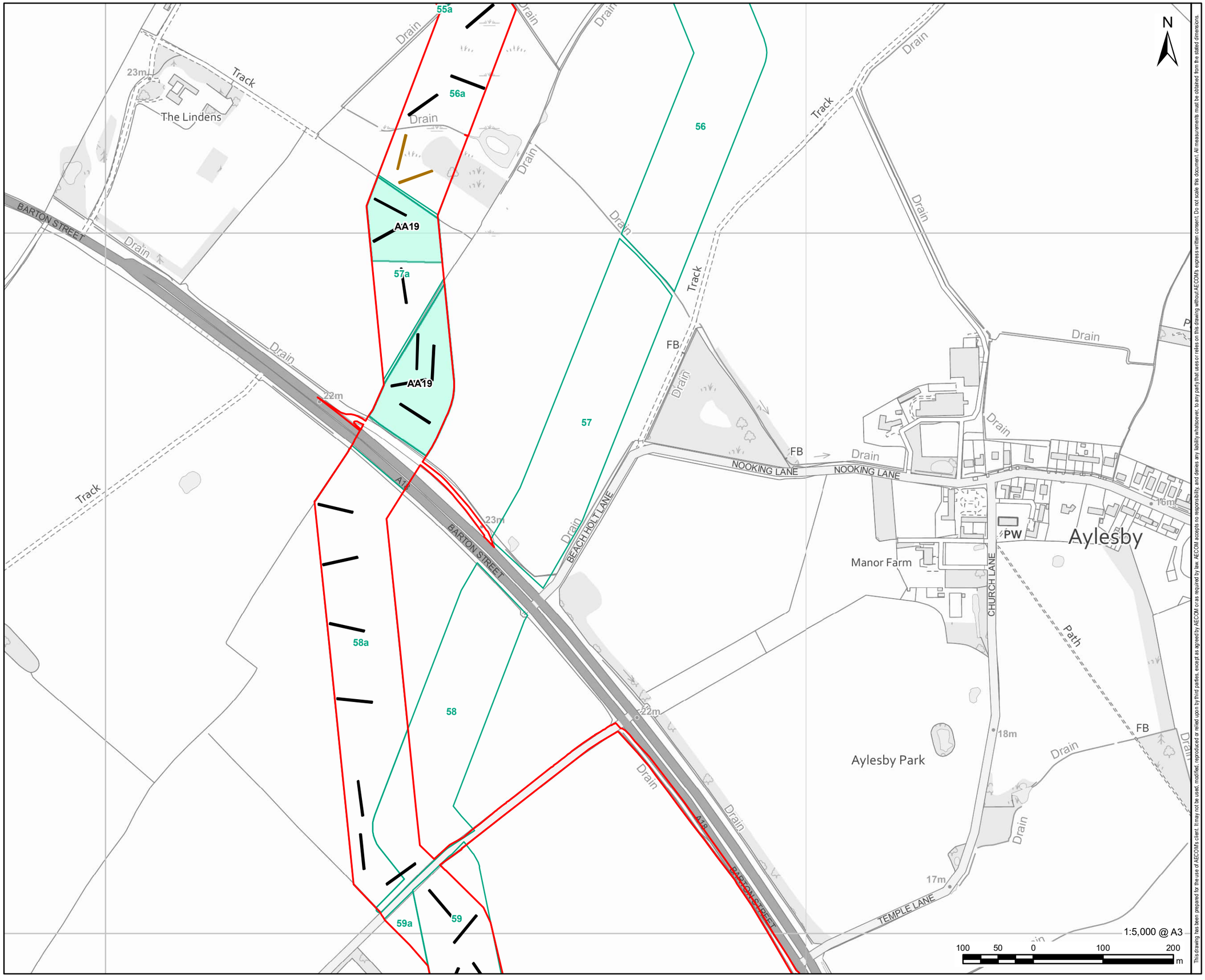

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

Provisional Archaeological Action Area (Type)

- AER (SMS)

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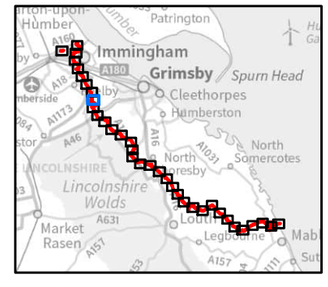

FIGURE TITLE

Figure 3 (8 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Route Section Break
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

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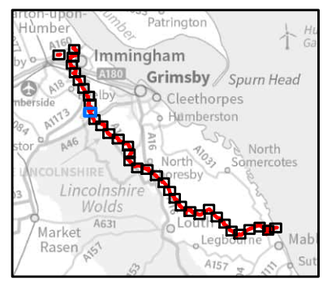

FIGURE TITLE

Figure 3 (9 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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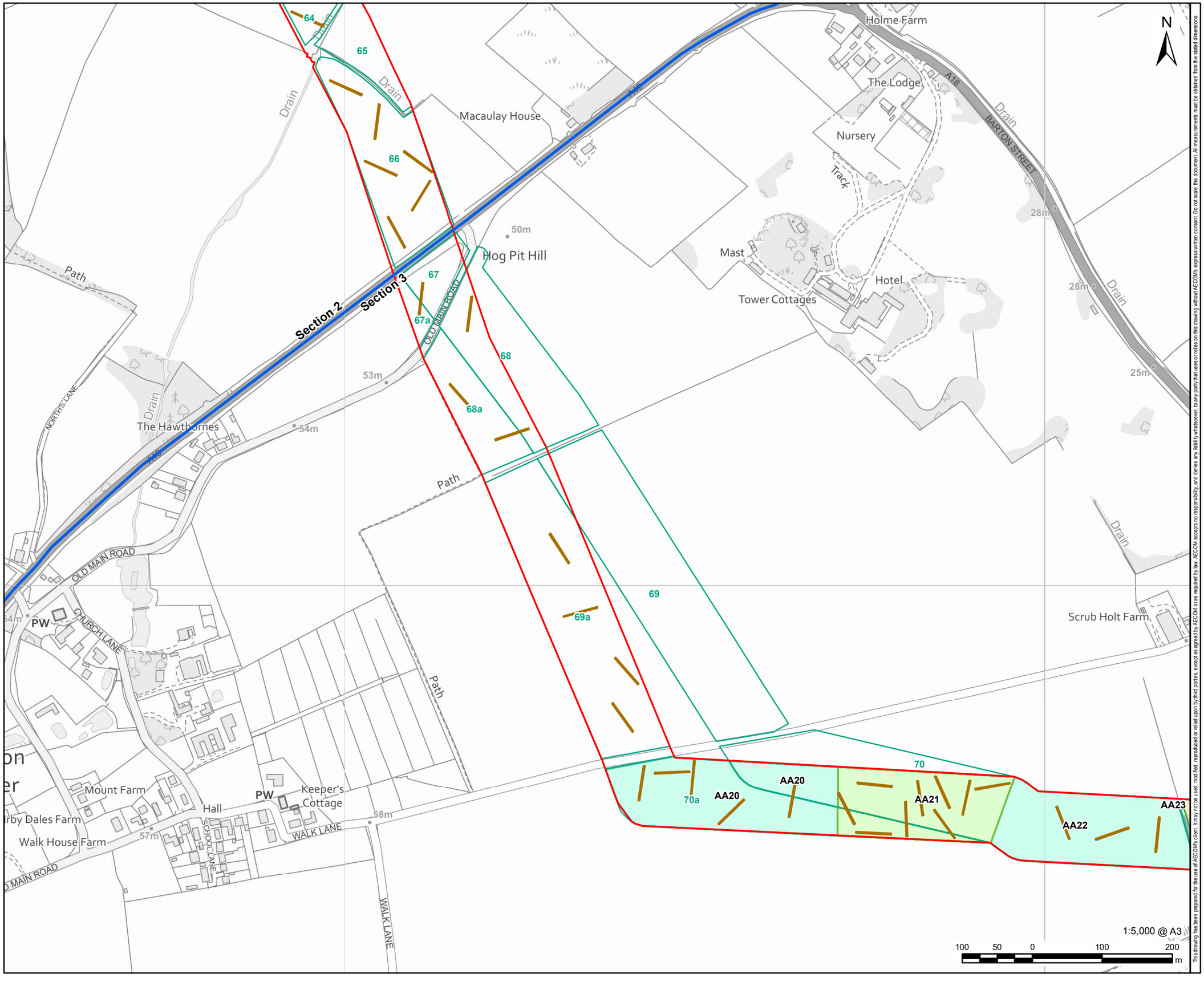

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Route Section Break
- Geophysical Survey Area - AOC Field Numbers
- Trench Location
  - Planned
- Provisional Archaeological Action Area (Type)
  - AER (SMS)
  - AER (targeted excavation)
  - Provisional action area (approach TBC)

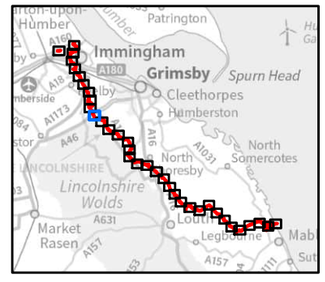

FIGURE TITLE

Figure 3 (10 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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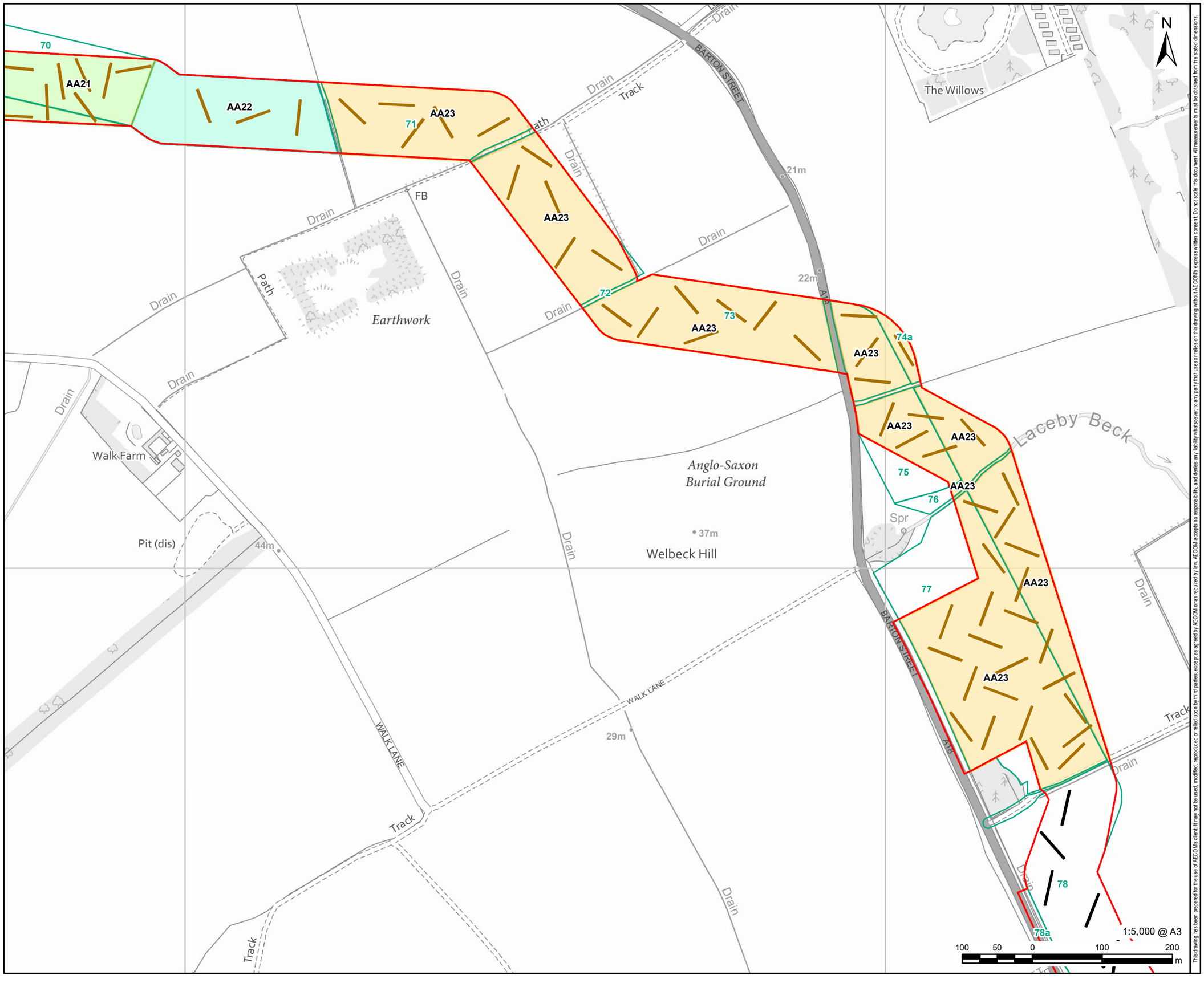

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

Provisional Archaeological Action Area (Type)

- AER (SMS)
- AER (targeted excavation)
- Provisional action area (approach TBC)

NOTES:

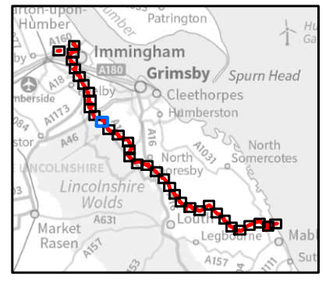

FIGURE TITLE

Figure 3 (11 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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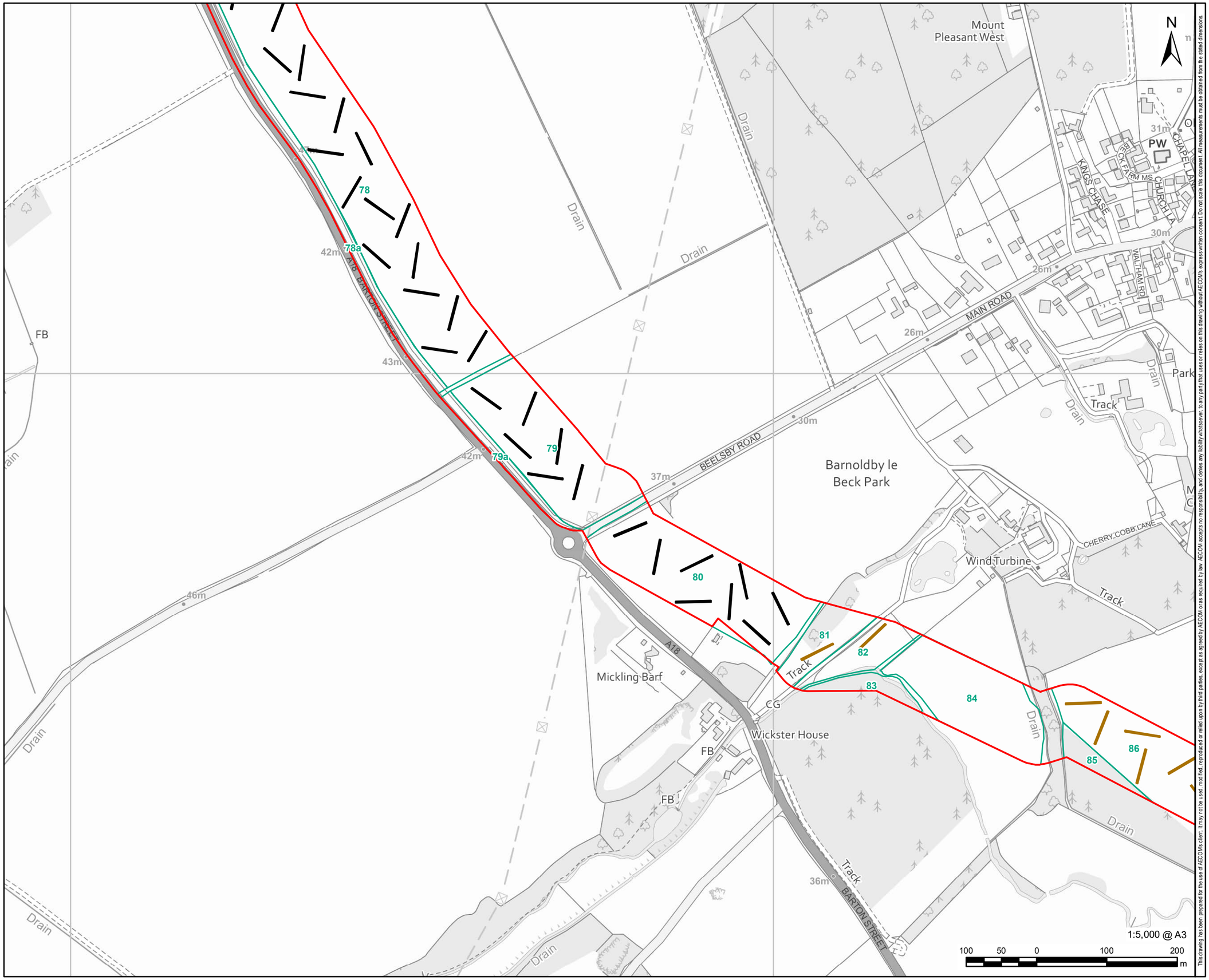

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

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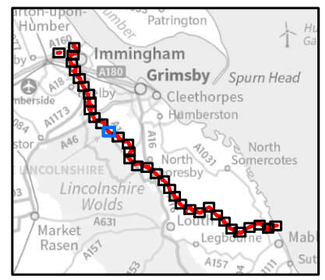

FIGURE TITLE

Figure 3 (12 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_3

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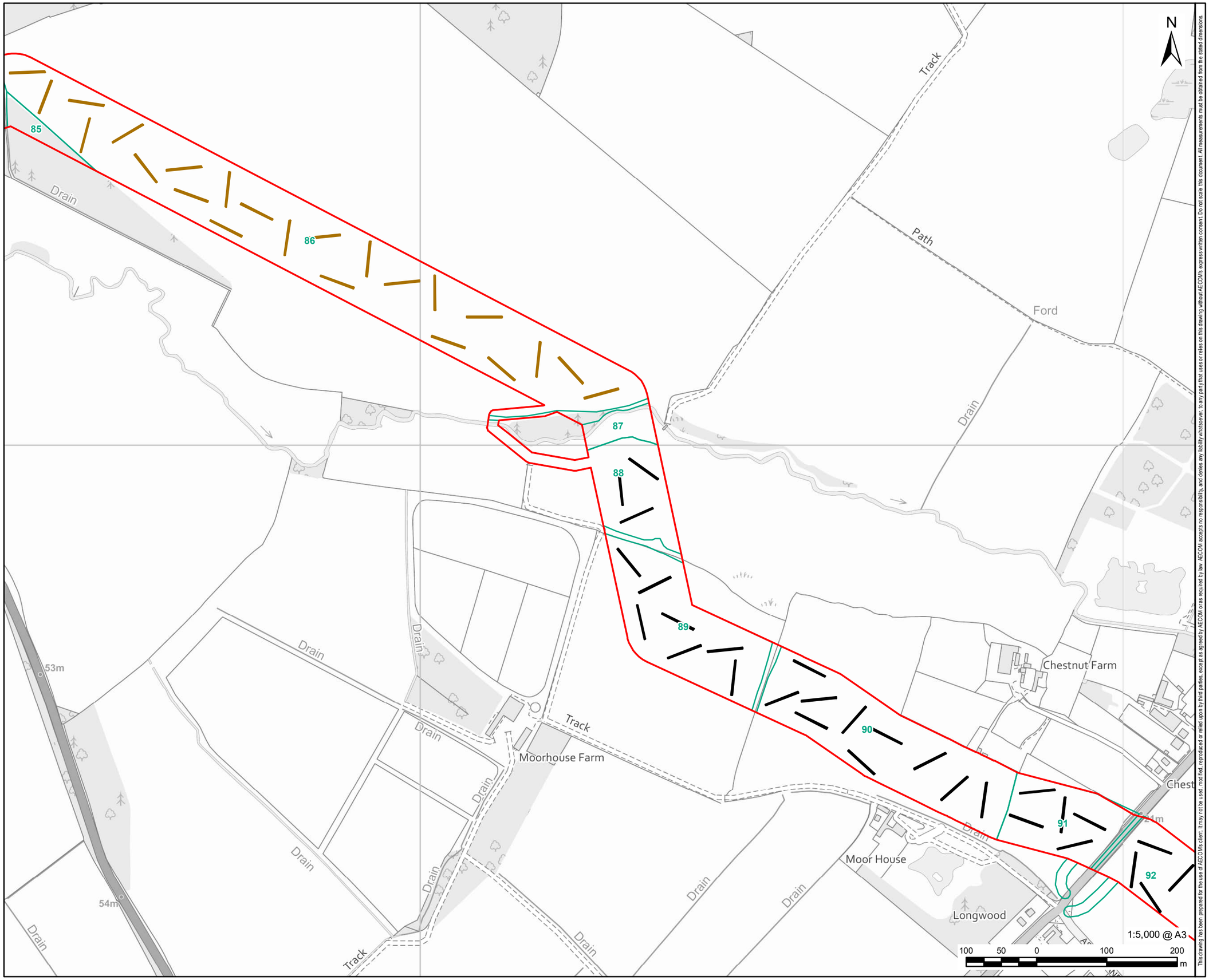

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

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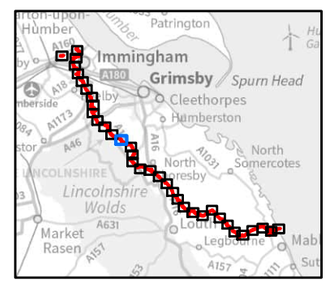

FIGURE TITLE

Figure 3 (13 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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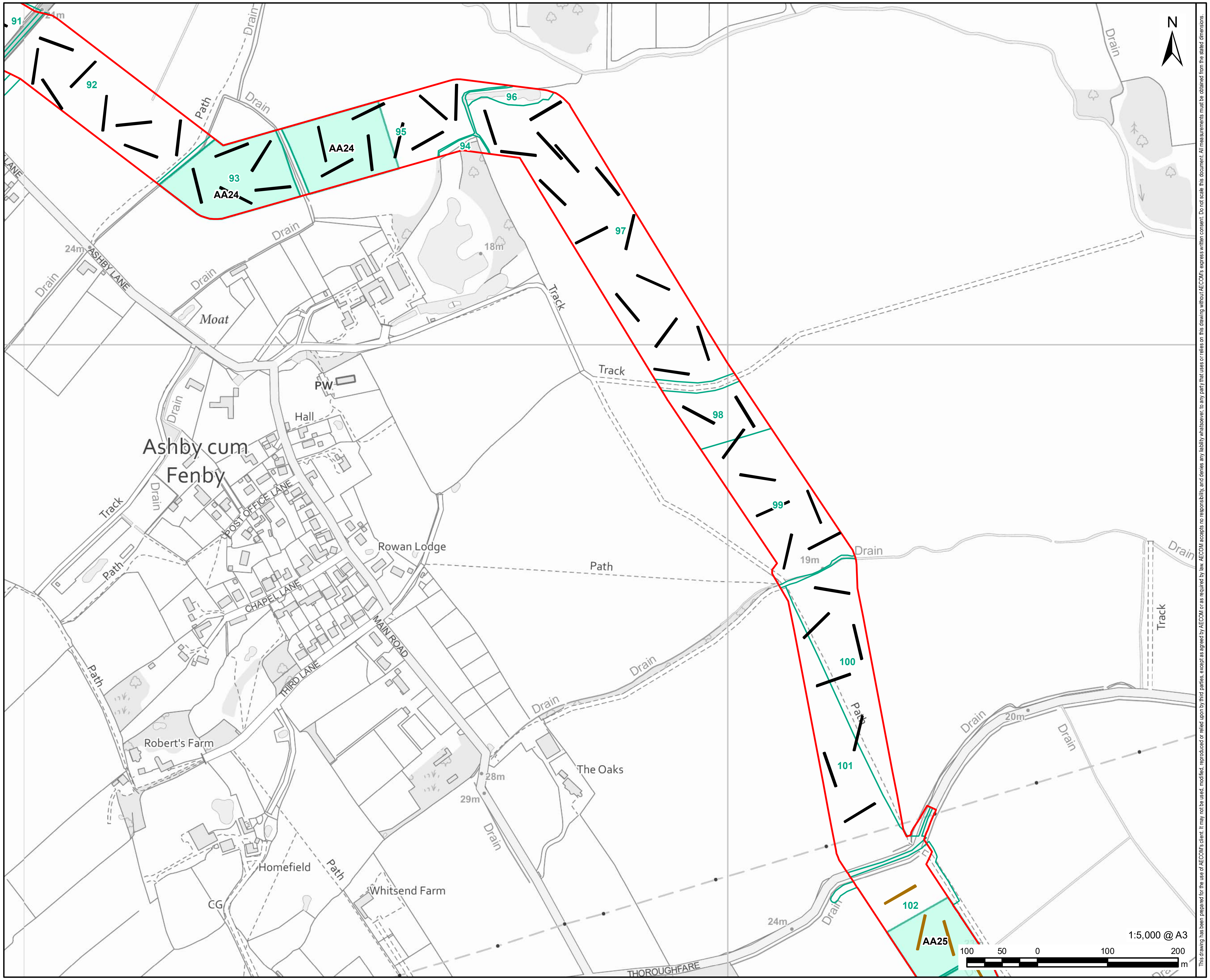

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

DCO Site Boundary

Geophysical Survey Area - AOC Field Numbers

Trench Location

Excavated

Planned

Provisional Archaeological Action Area (Type)

AER (SMS)

NOTES:

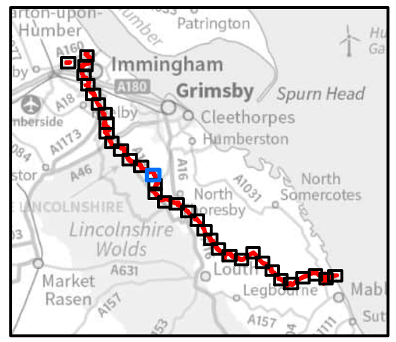

FIGURE TITLE

Figure 3 (14 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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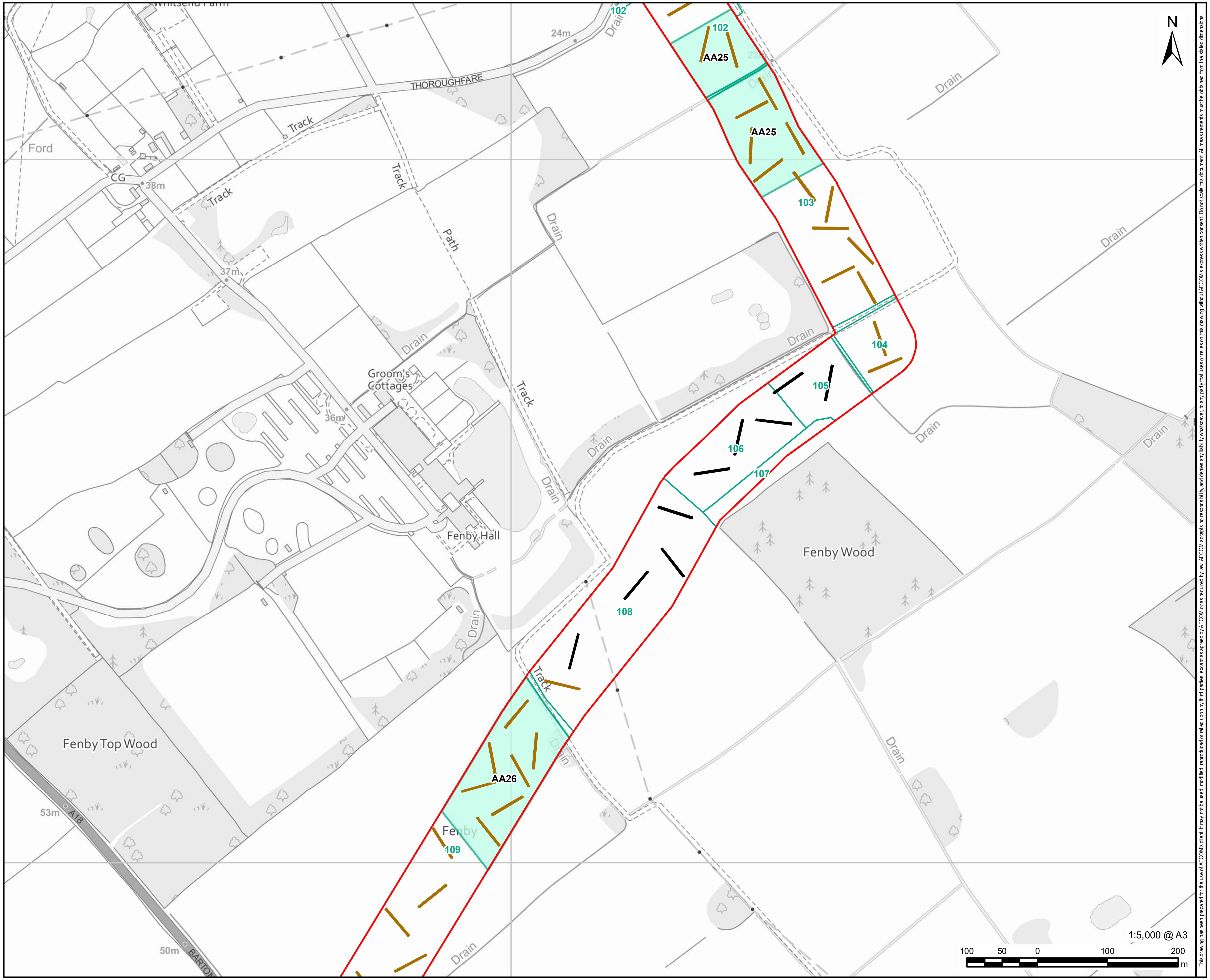

PROJECT

Viking CCS Pipeline

LEGEND

DCO Site Boundary

Geophysical Survey Area - AOC Field Numbers

Trench Location

Excavated

Planned

Provisional Archaeological Action Area (Type)

AER (SMS)

NOTES:

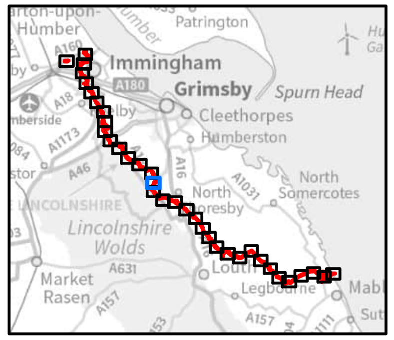

FIGURE TITLE

Figure 3 (15 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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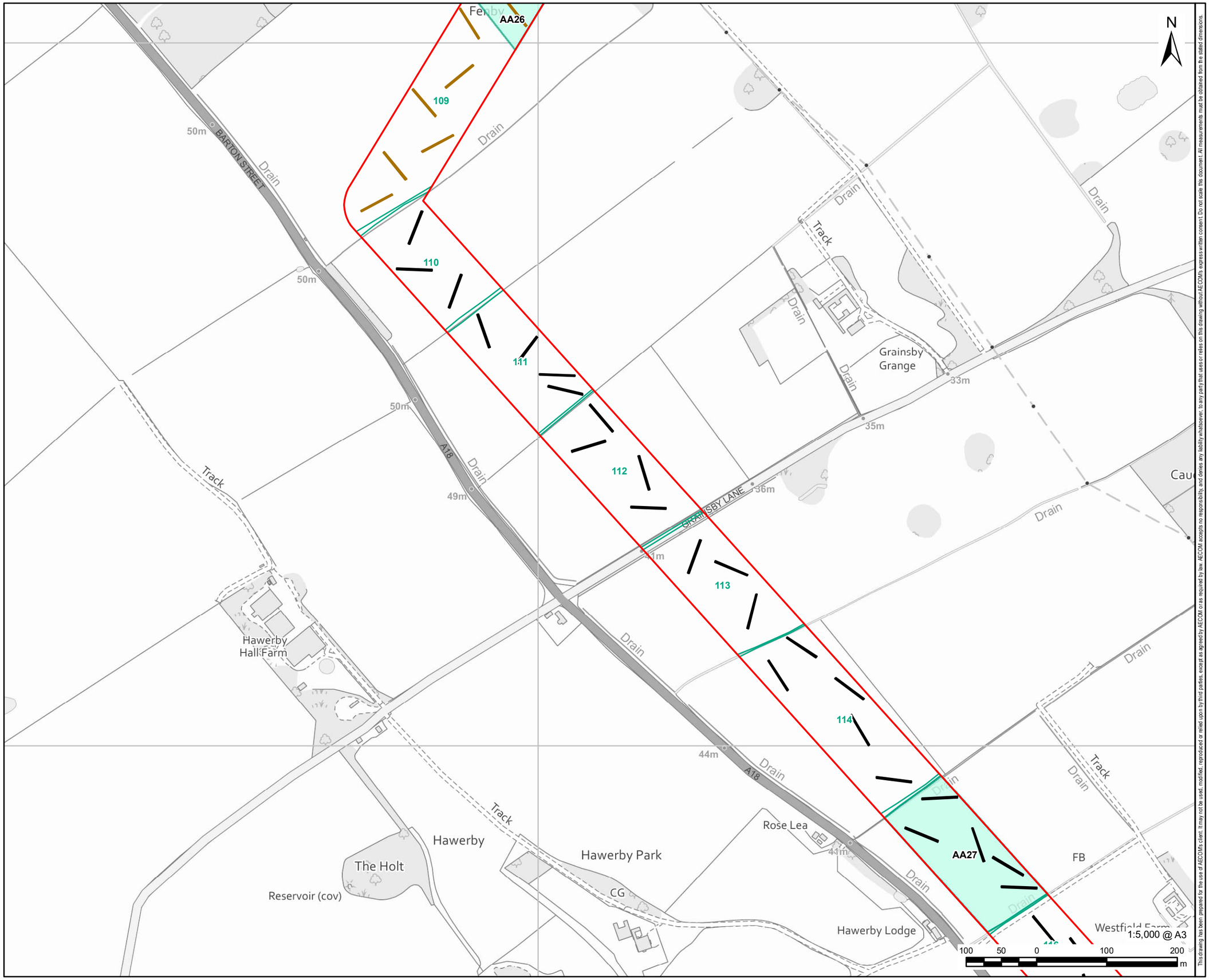

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

Provisional Archaeological Action Area (Type)

- AER (SMS)

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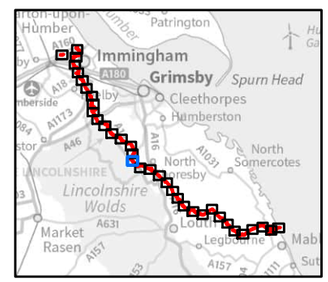

FIGURE TITLE

Figure 3 (16 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_3

Revision: 3 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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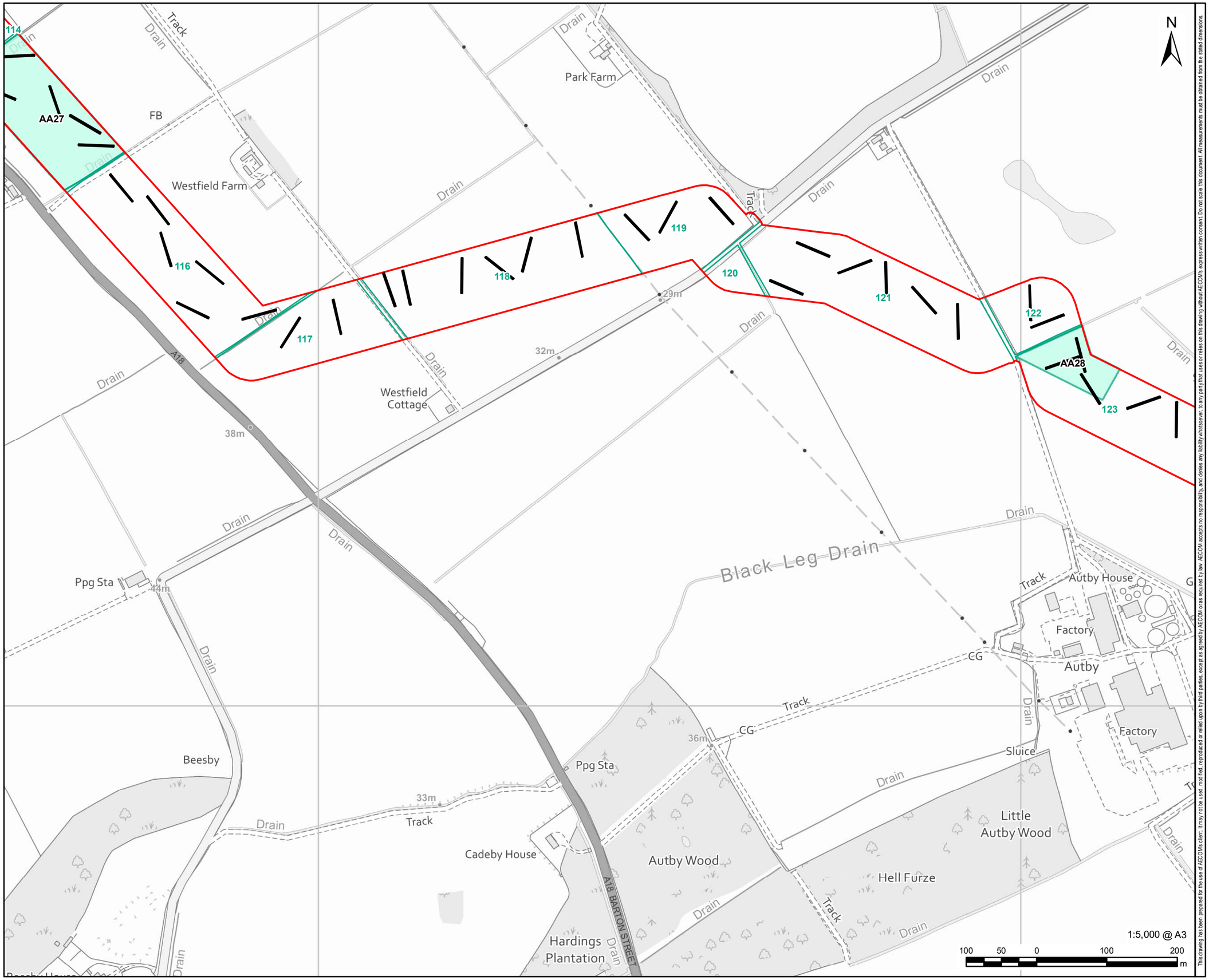

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated

Provisional Archaeological Action Area (Type)

- AER (SMS)

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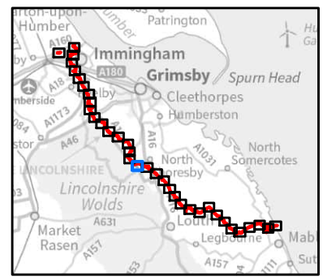

FIGURE TITLE

Figure 3 (17 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_3

Revision: 3 Drawn: LC Checked: CM Approved: MW Date: 2024-09-18

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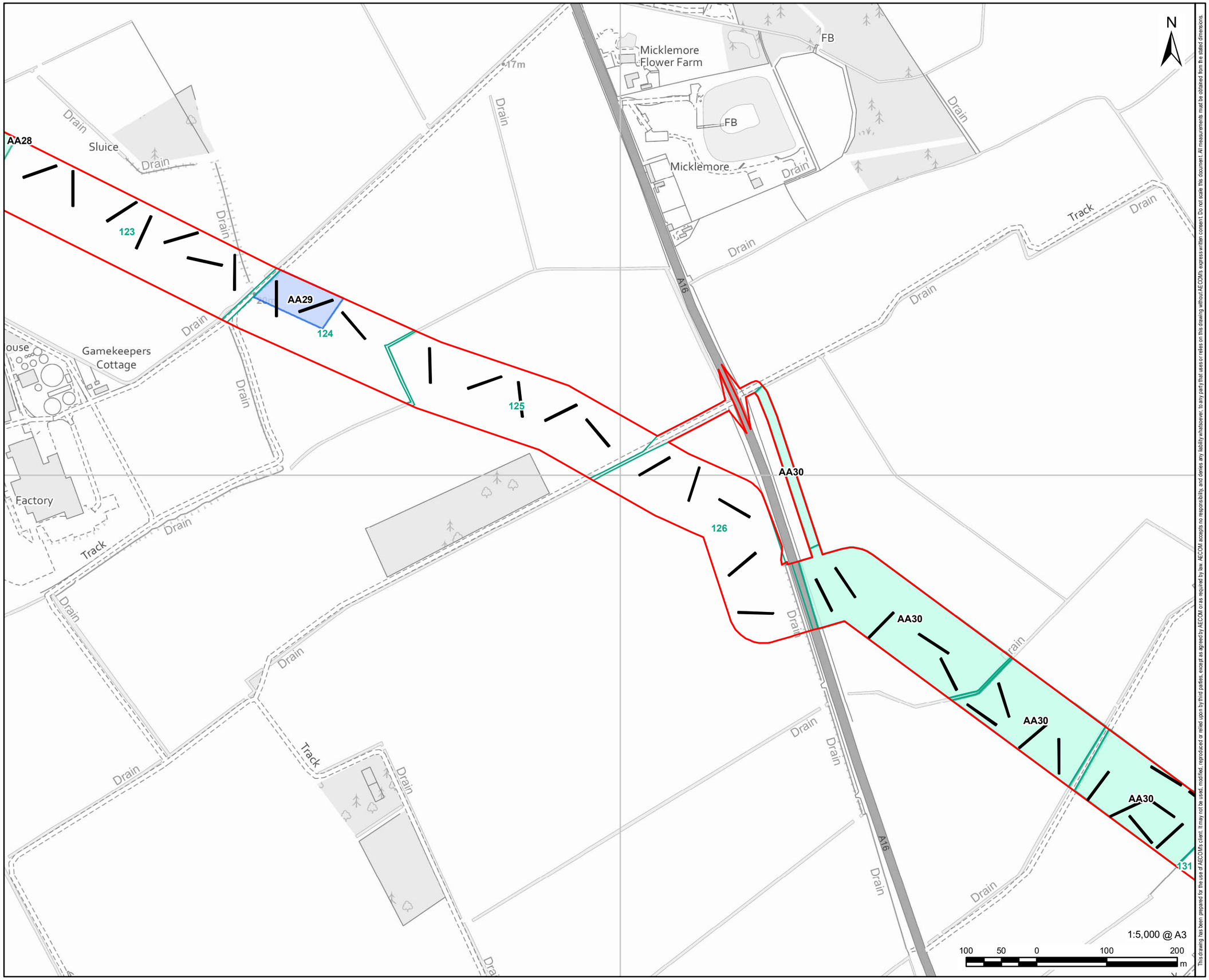

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated

Provisional Archaeological Action Area (Type)

- AER (SMS)
- AMR

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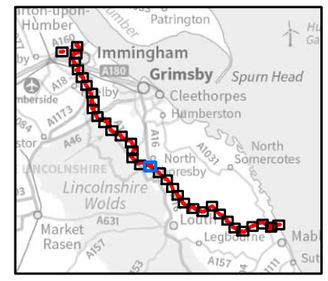

FIGURE TITLE

Figure 3 (18 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_3

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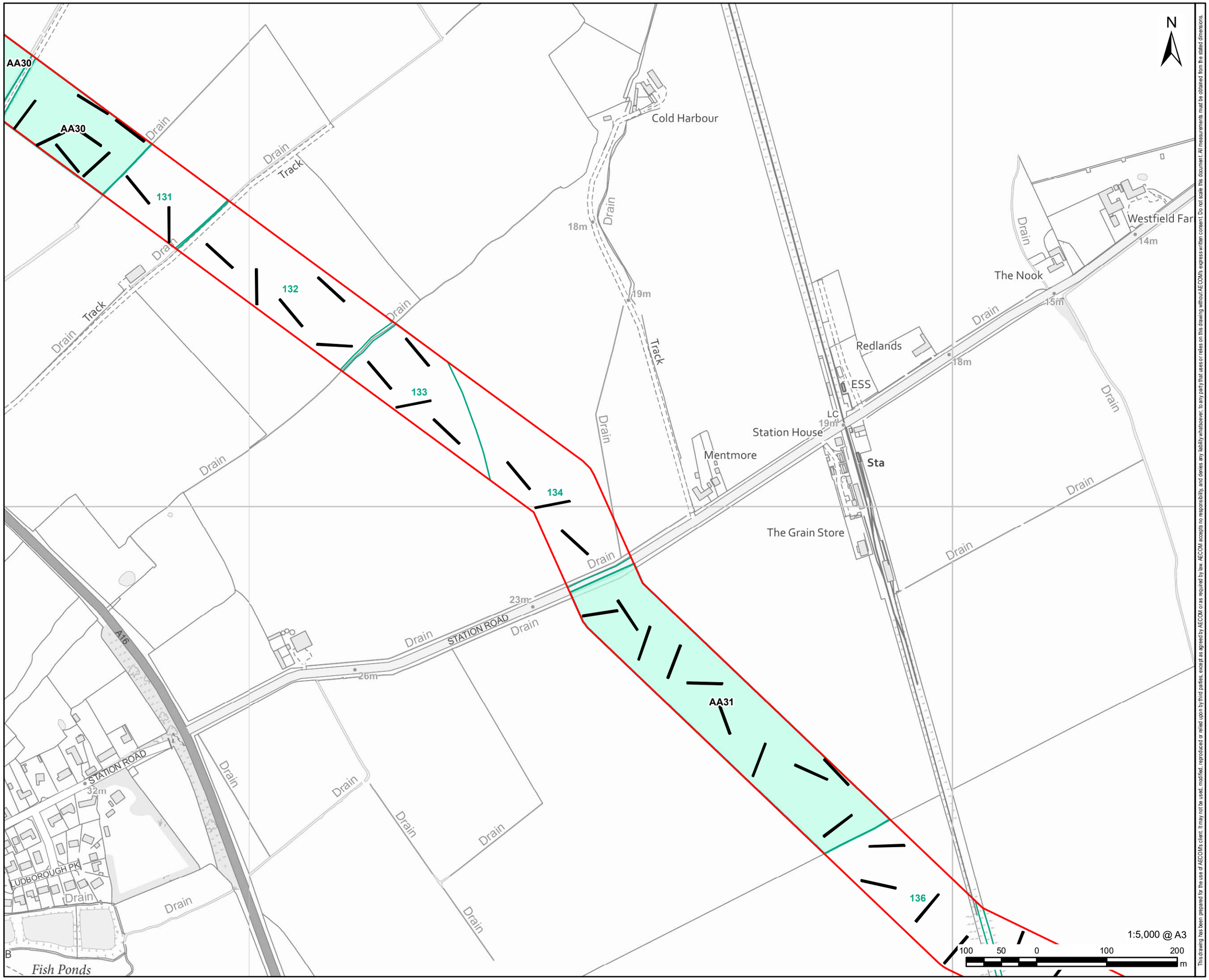

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated

Provisional Archaeological Action Area (Type)

- AER (SMS)

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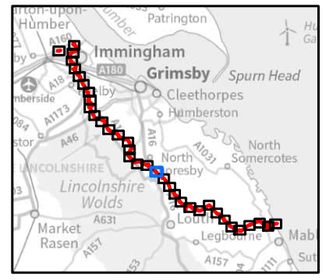

FIGURE TITLE

Figure 3 (19 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

60668955 / VCCS_240918_AMS_3

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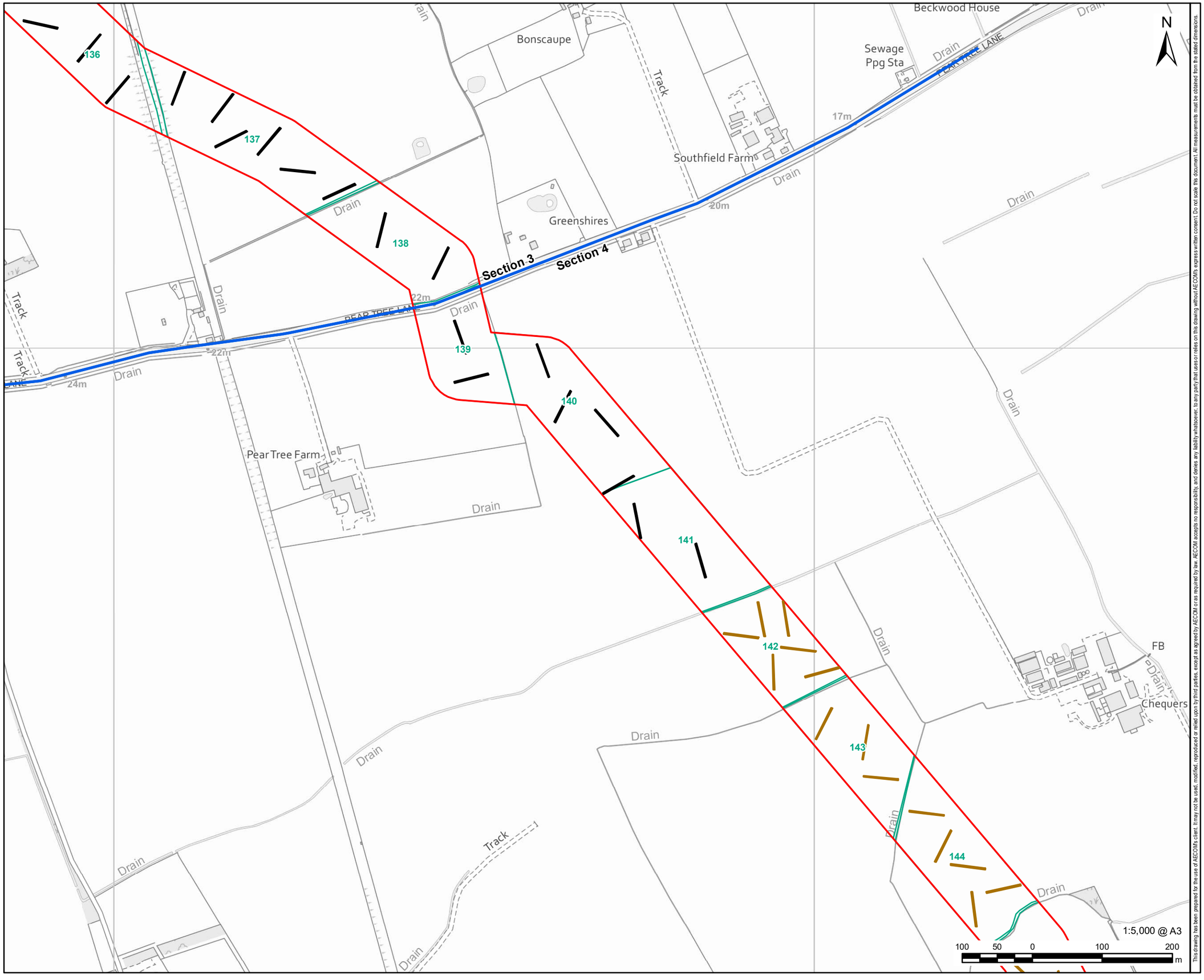

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Route Section Break
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

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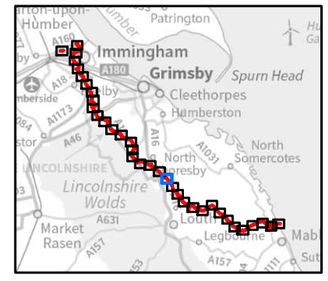

FIGURE TITLE

Figure 3 (20 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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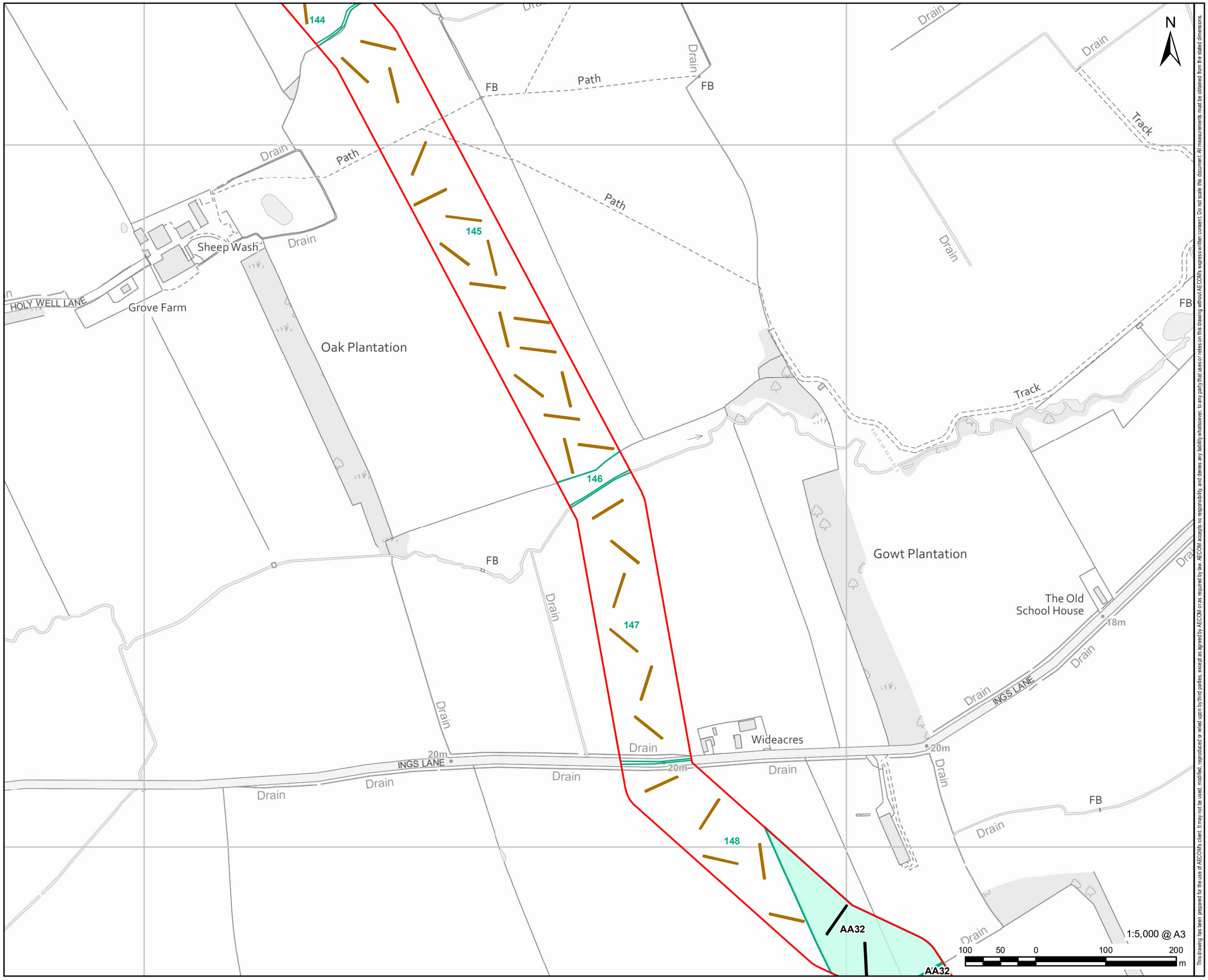

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

Provisional Archaeological Action Area (Type)

- AER (SMS)

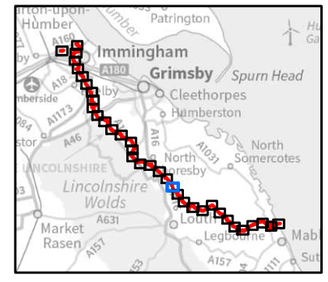

FIGURE TITLE

Figure 3 (21 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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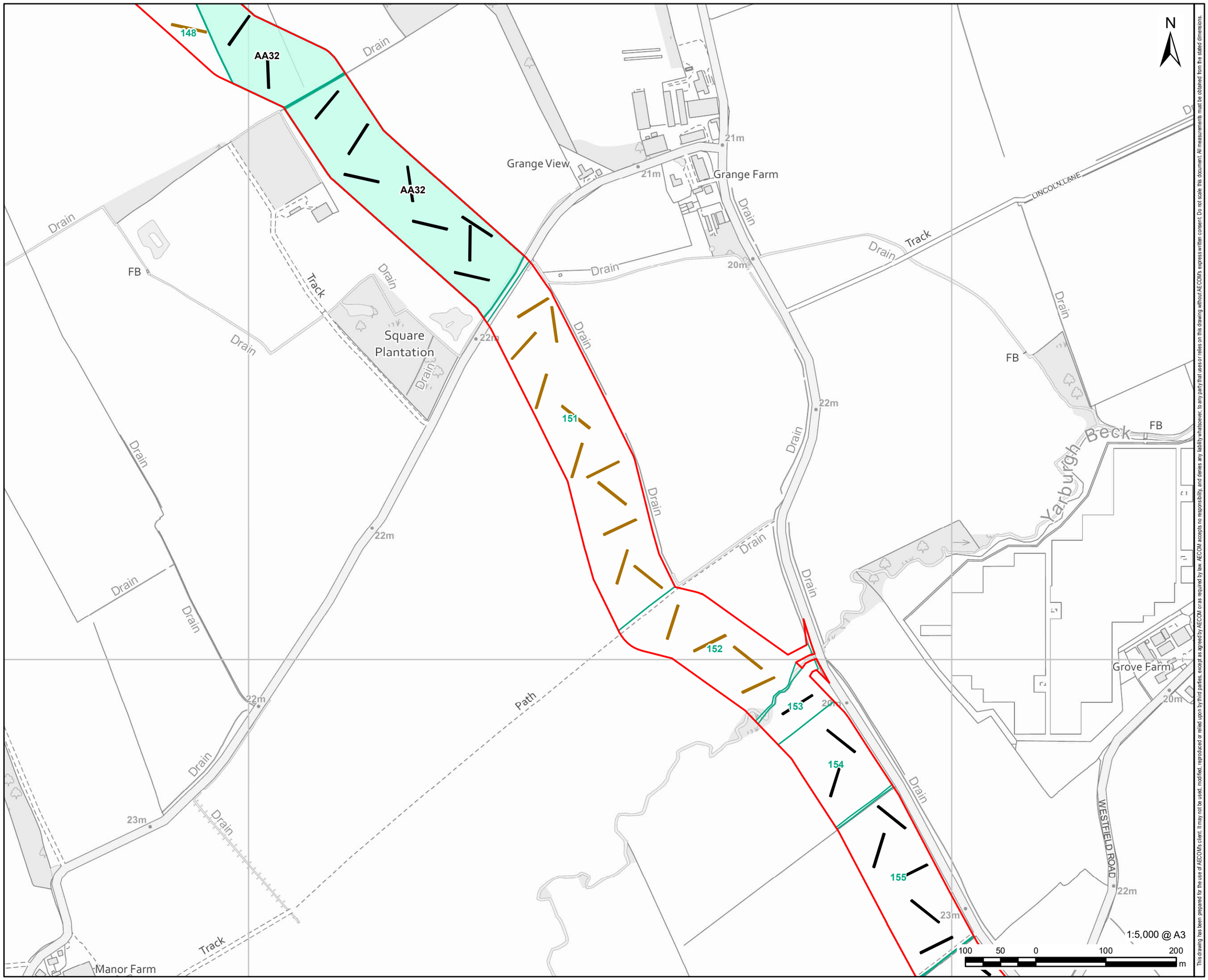

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VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

Provisional Archaeological Action Area (Type)

- AER (SMS)

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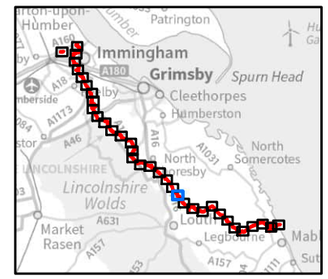

FIGURE TITLE

Figure 3 (22 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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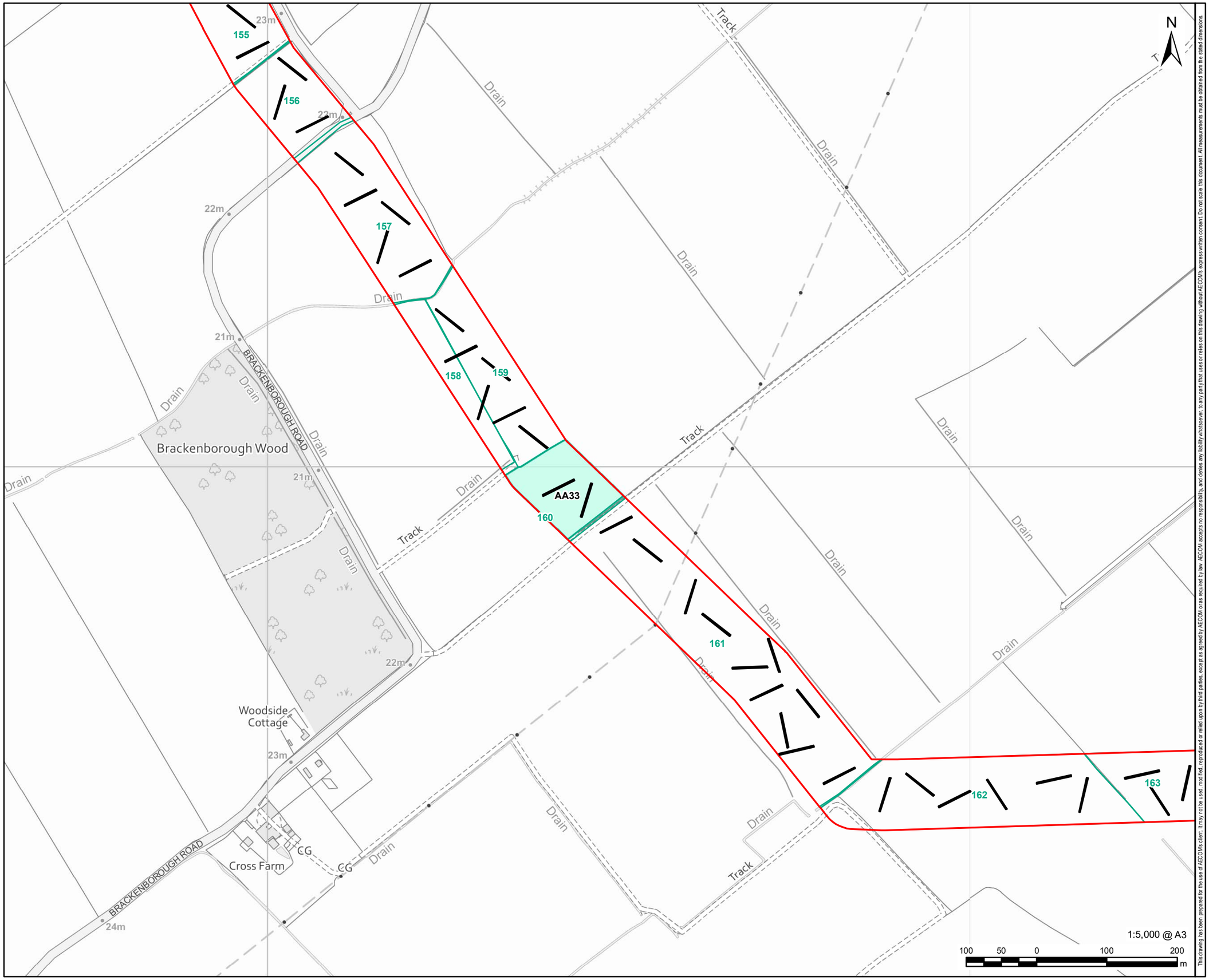

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- Trench Location
- Excavated
- Provisional Archaeological Action Area (Type)
- AER (SMS)

NOTES:

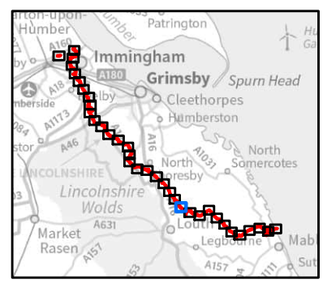

FIGURE TITLE

Figure 3 (23 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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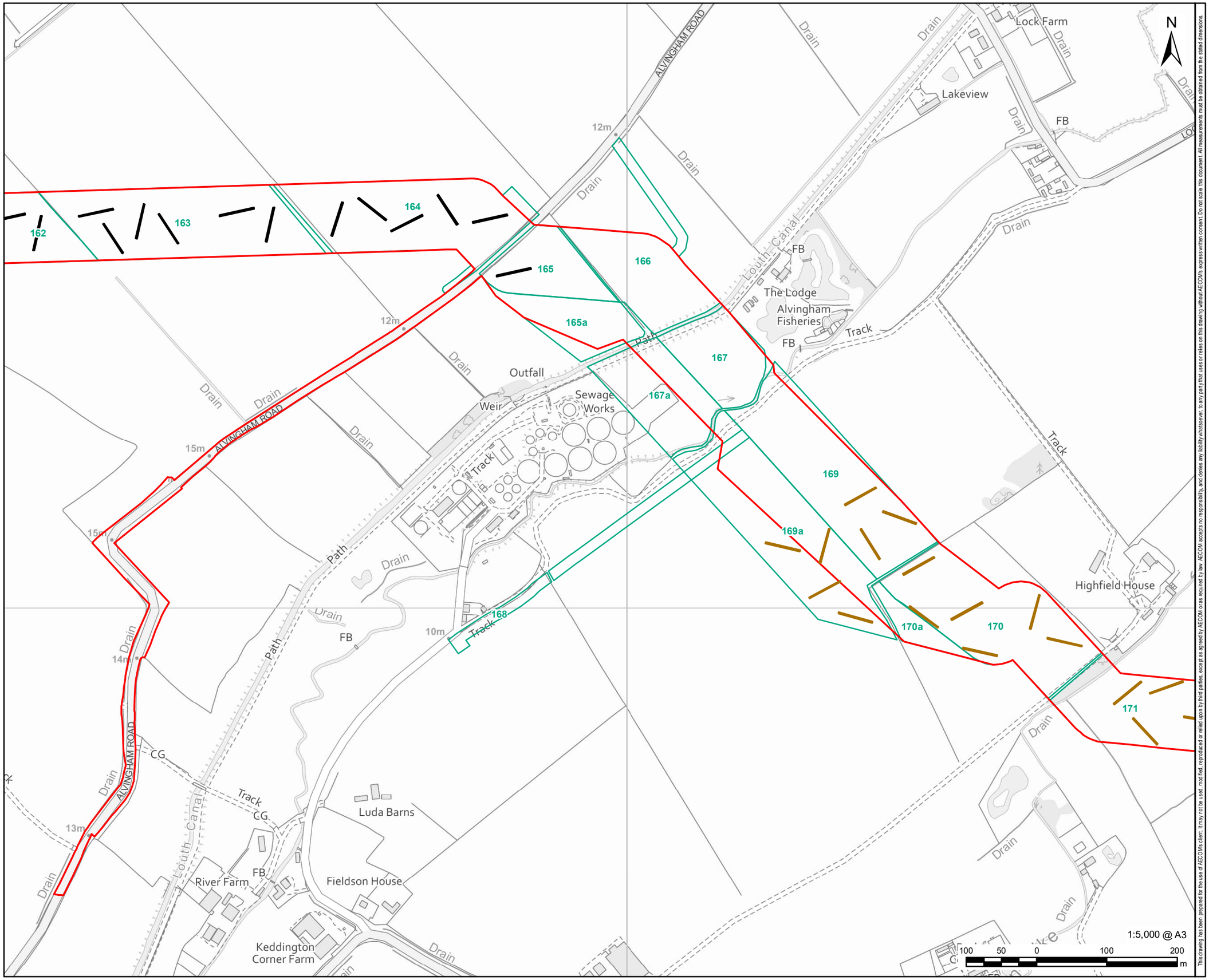

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

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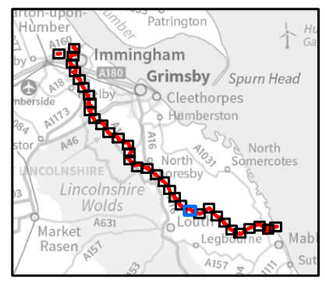

FIGURE TITLE

Figure 3 (24 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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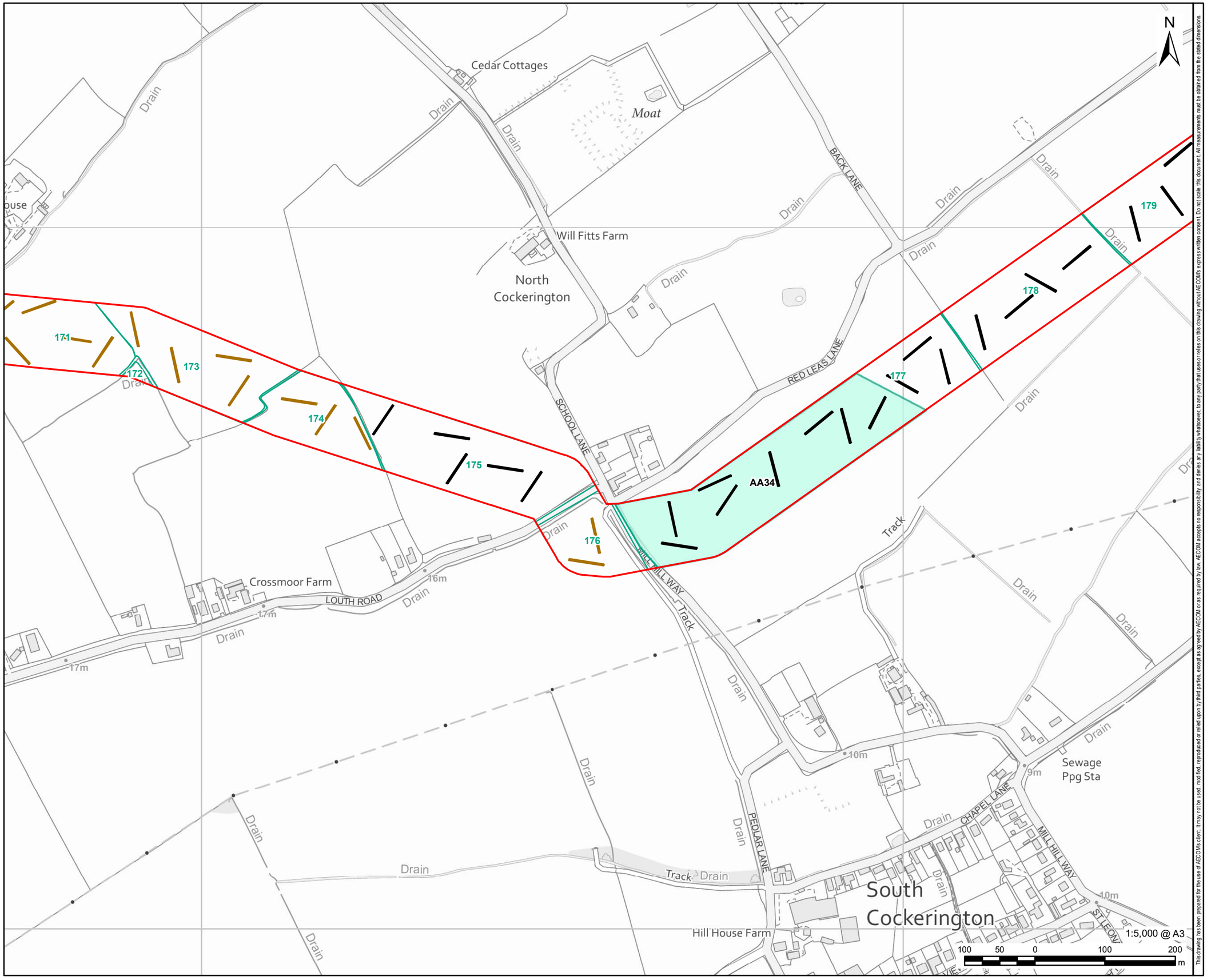

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

Provisional Archaeological Action Area (Type)

- AER (SMS)

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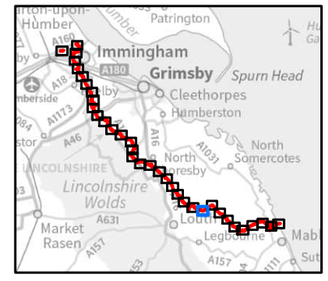

FIGURE TITLE

Figure 3 (25 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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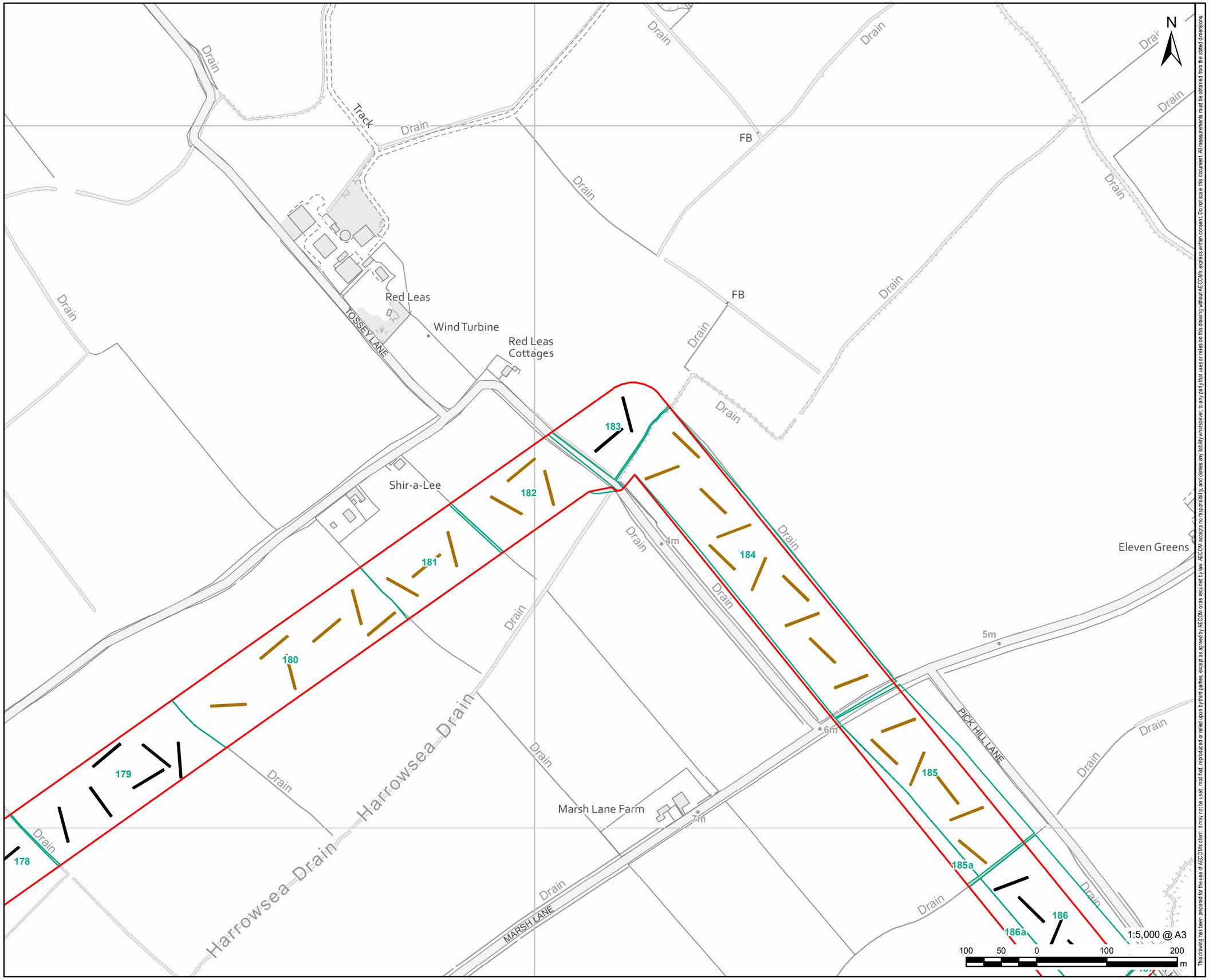

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

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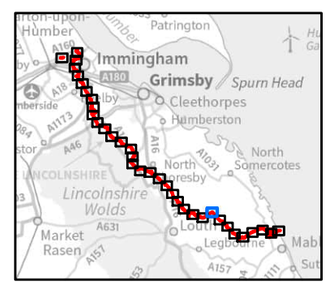

FIGURE TITLE

Figure 3 (26 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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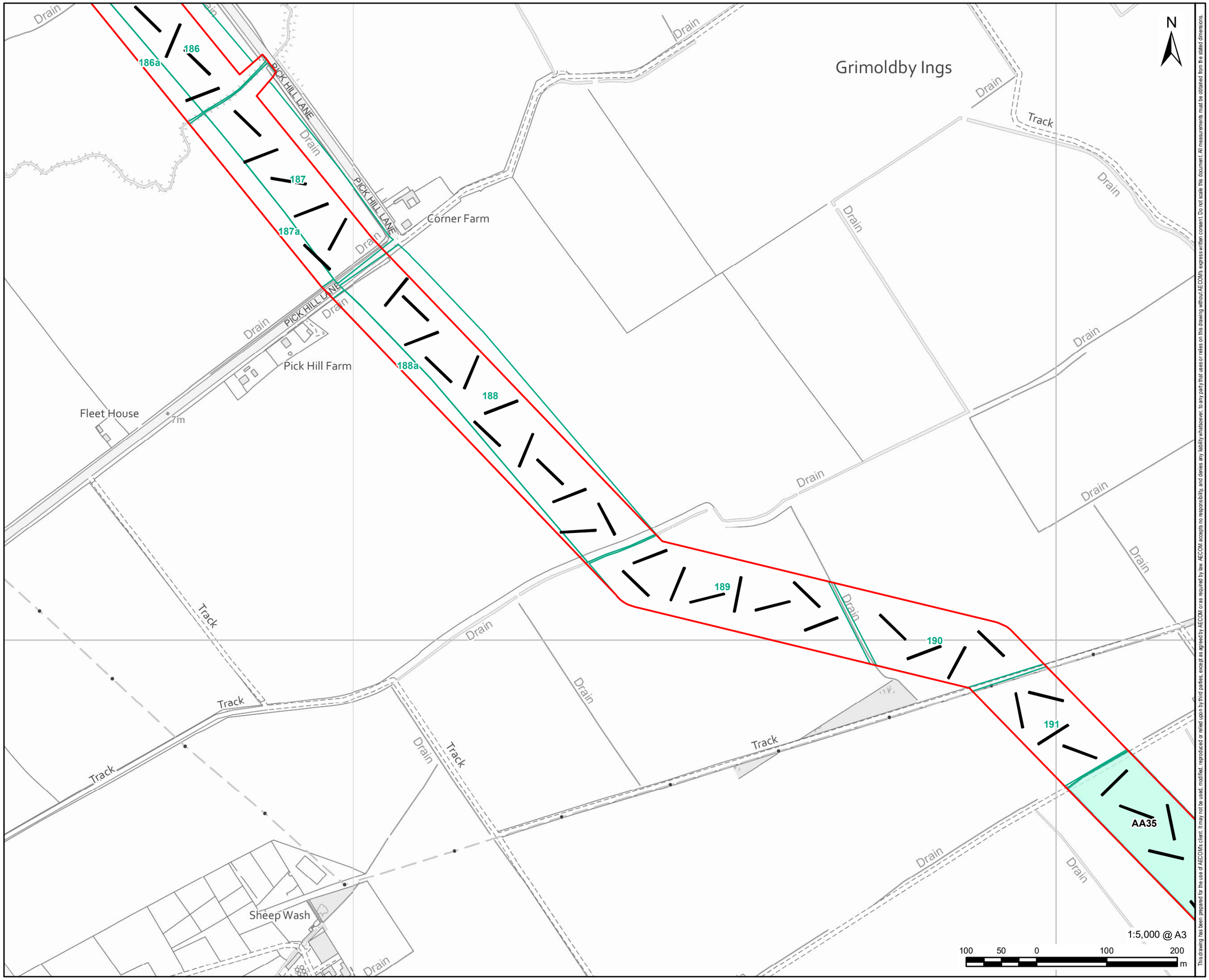

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- Trench Location
- Excavated
- Provisional Archaeological Action Area (Type)
- AER (SMS)

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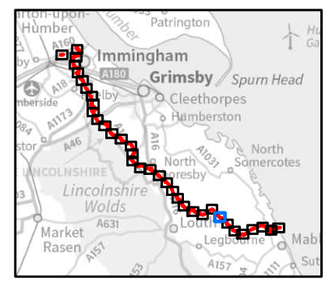

FIGURE TITLE

Figure 3 (27 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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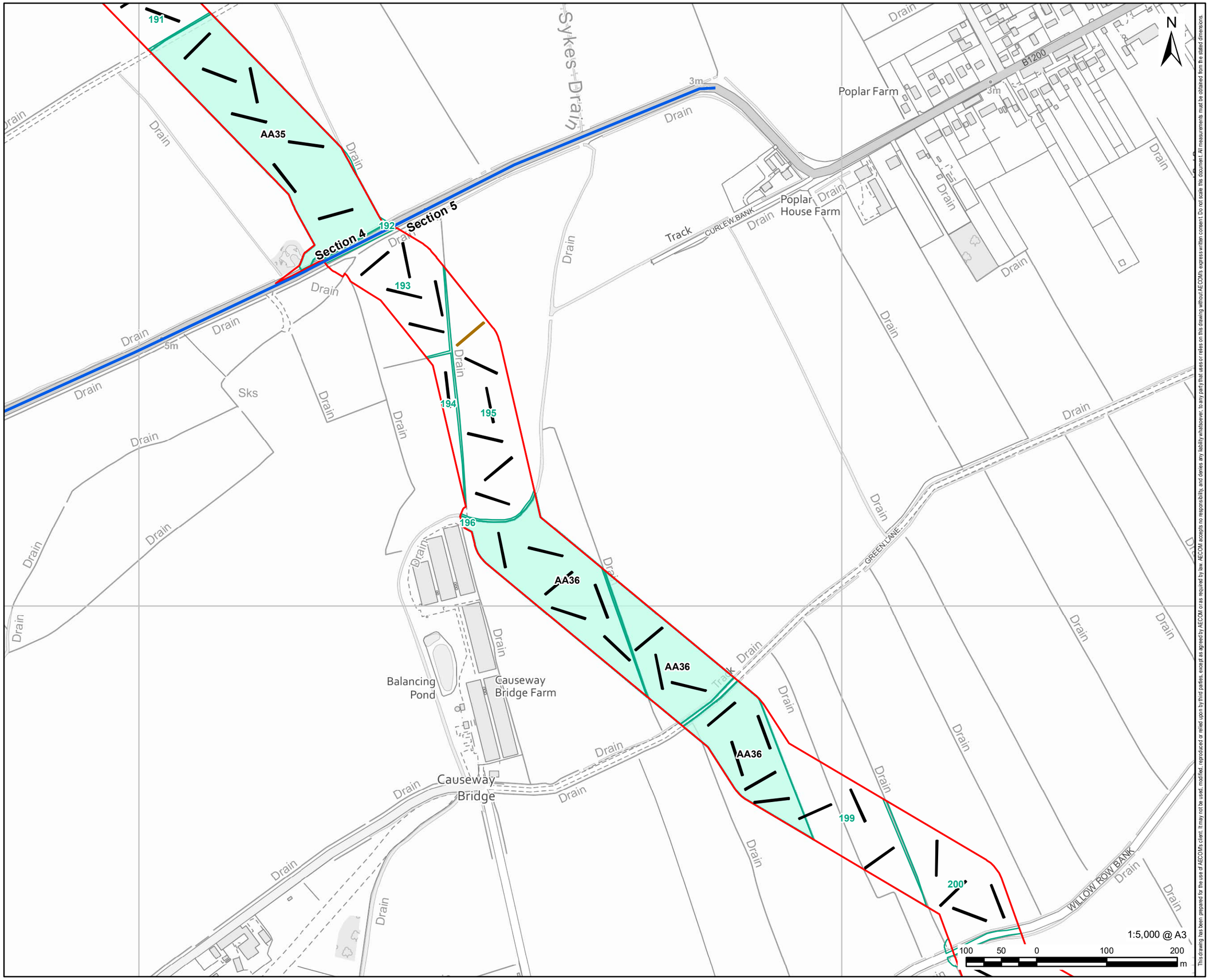

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Route Section Break
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

Provisional Archaeological Action Area (Type)

- AER (SMS)

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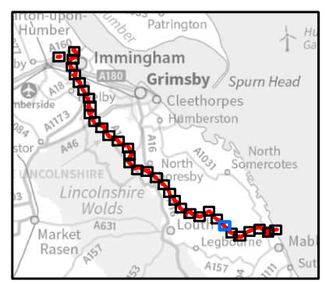

FIGURE TITLE

Figure 3 (28 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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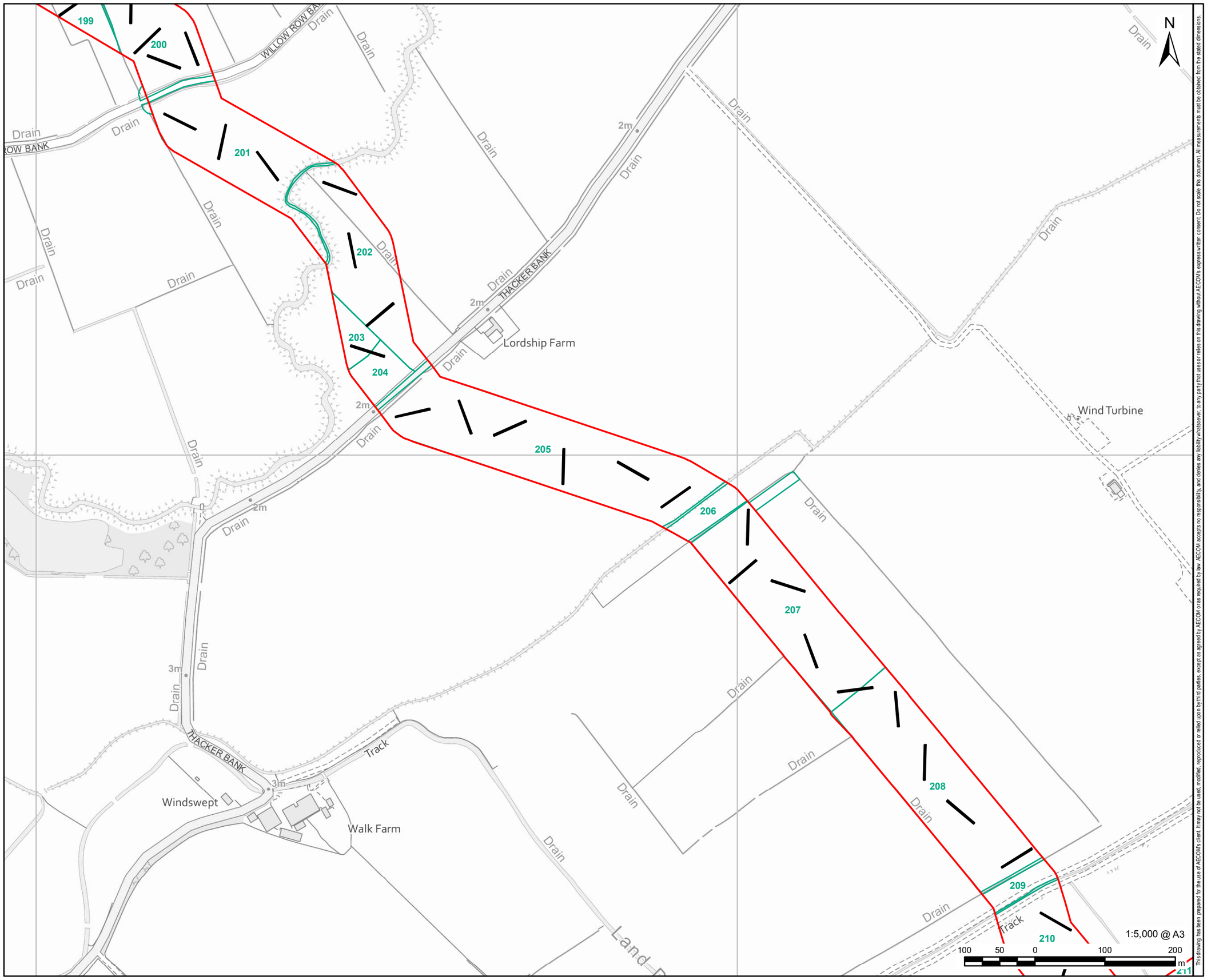

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers
- Trench Location
- Excavated

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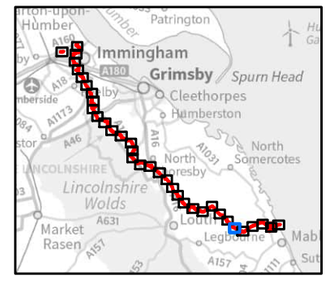

FIGURE TITLE

Figure 3 (29 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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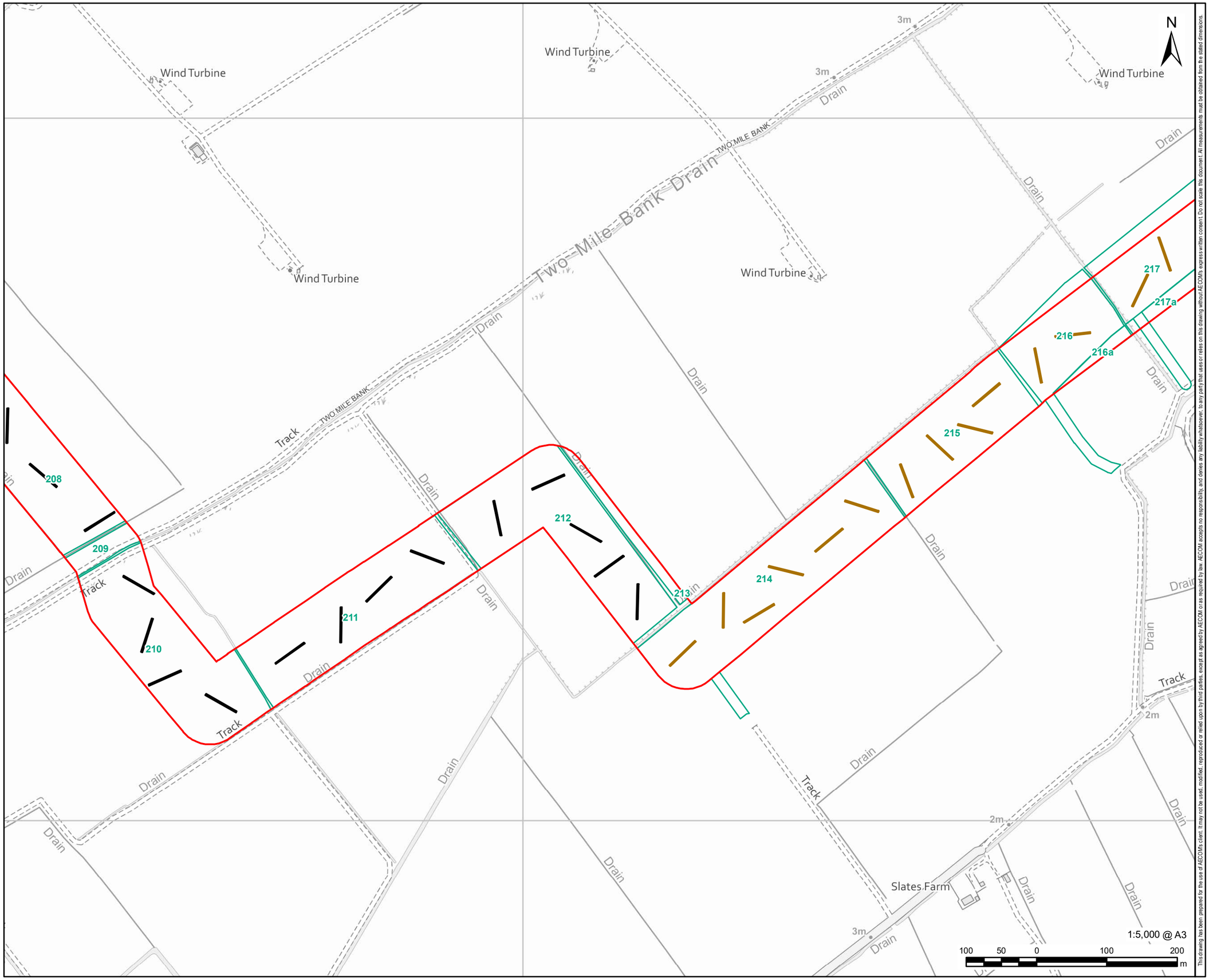

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

NOTES:

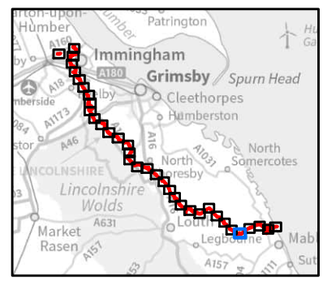

FIGURE TITLE

Figure 3 (30 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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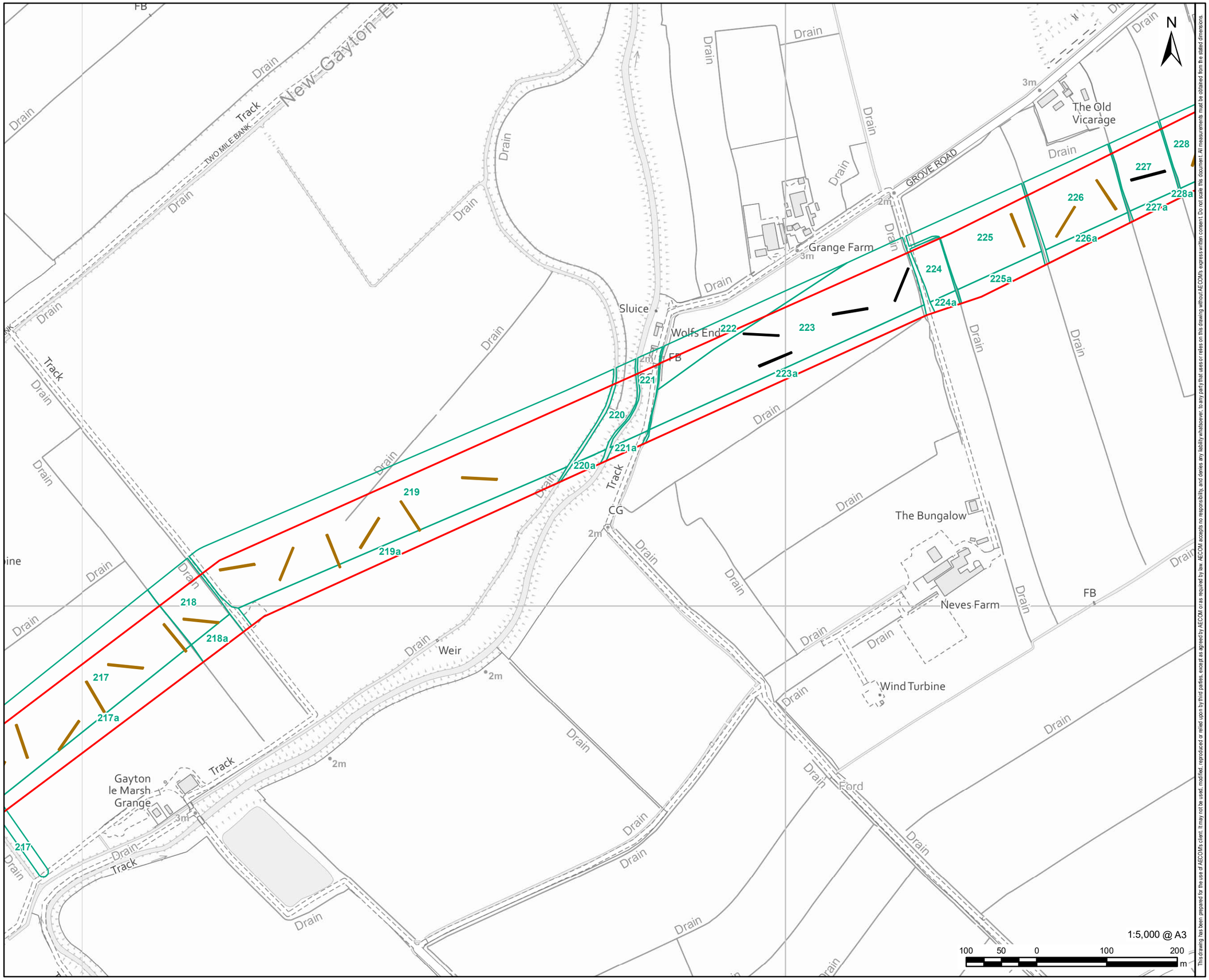

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

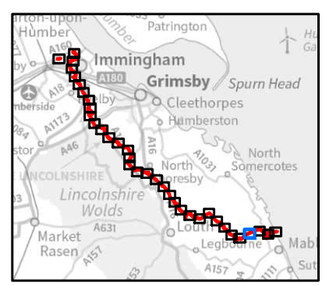

FIGURE TITLE

Figure 3 (31 of 35)
Completed Trench Locations

ISSUE PURPOSE

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PROJECT NUMBER / REFERENCE

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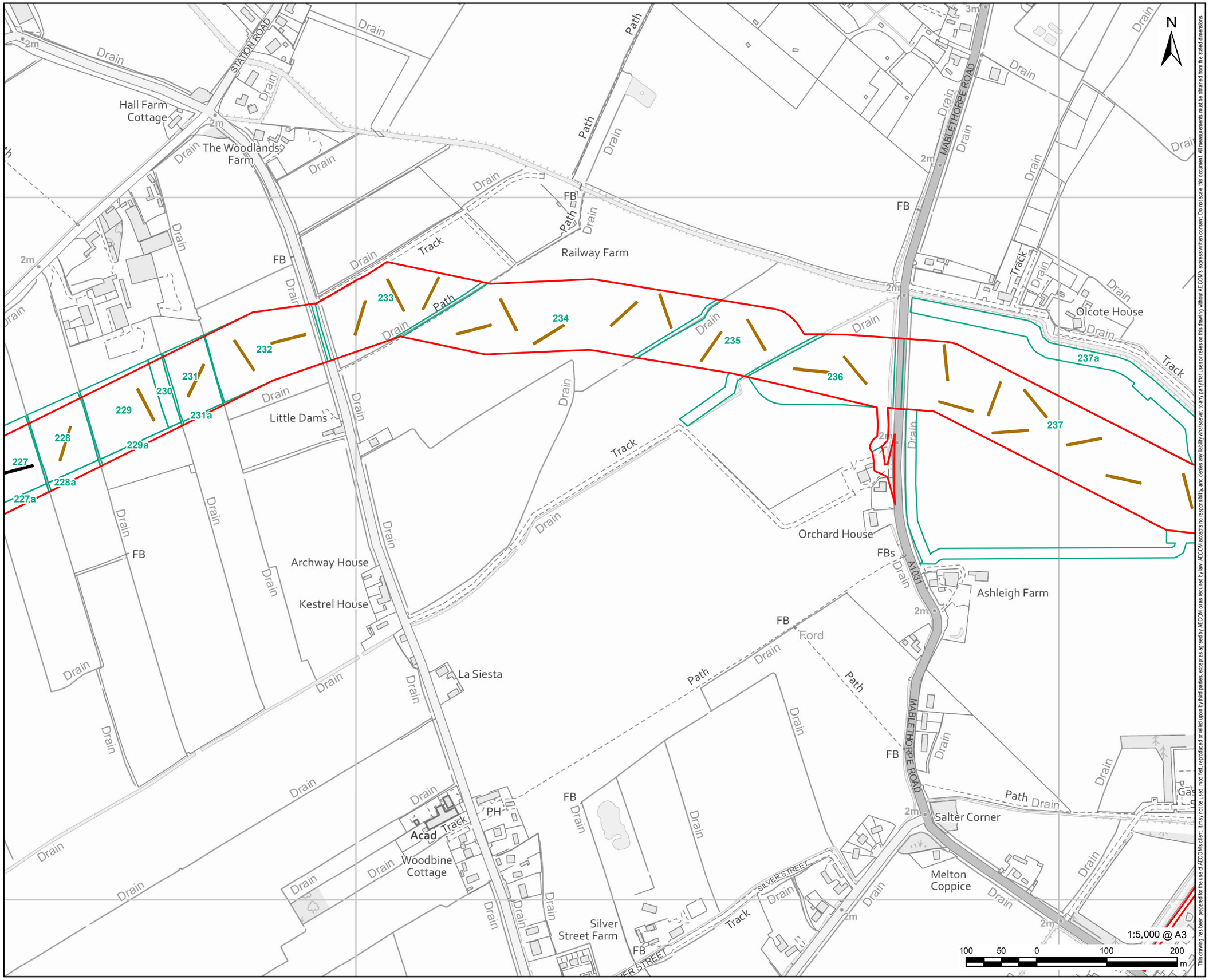

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PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

Trench Location

- Excavated
- Planned

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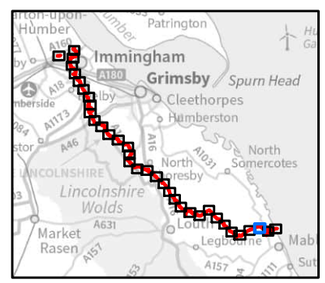

FIGURE TITLE

Figure 3 (32 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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VikingCCS

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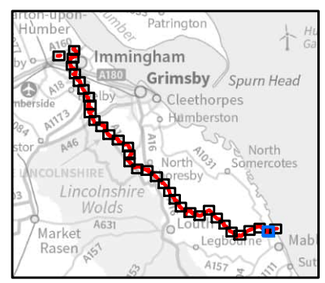

FIGURE TITLE

Figure 3 (33 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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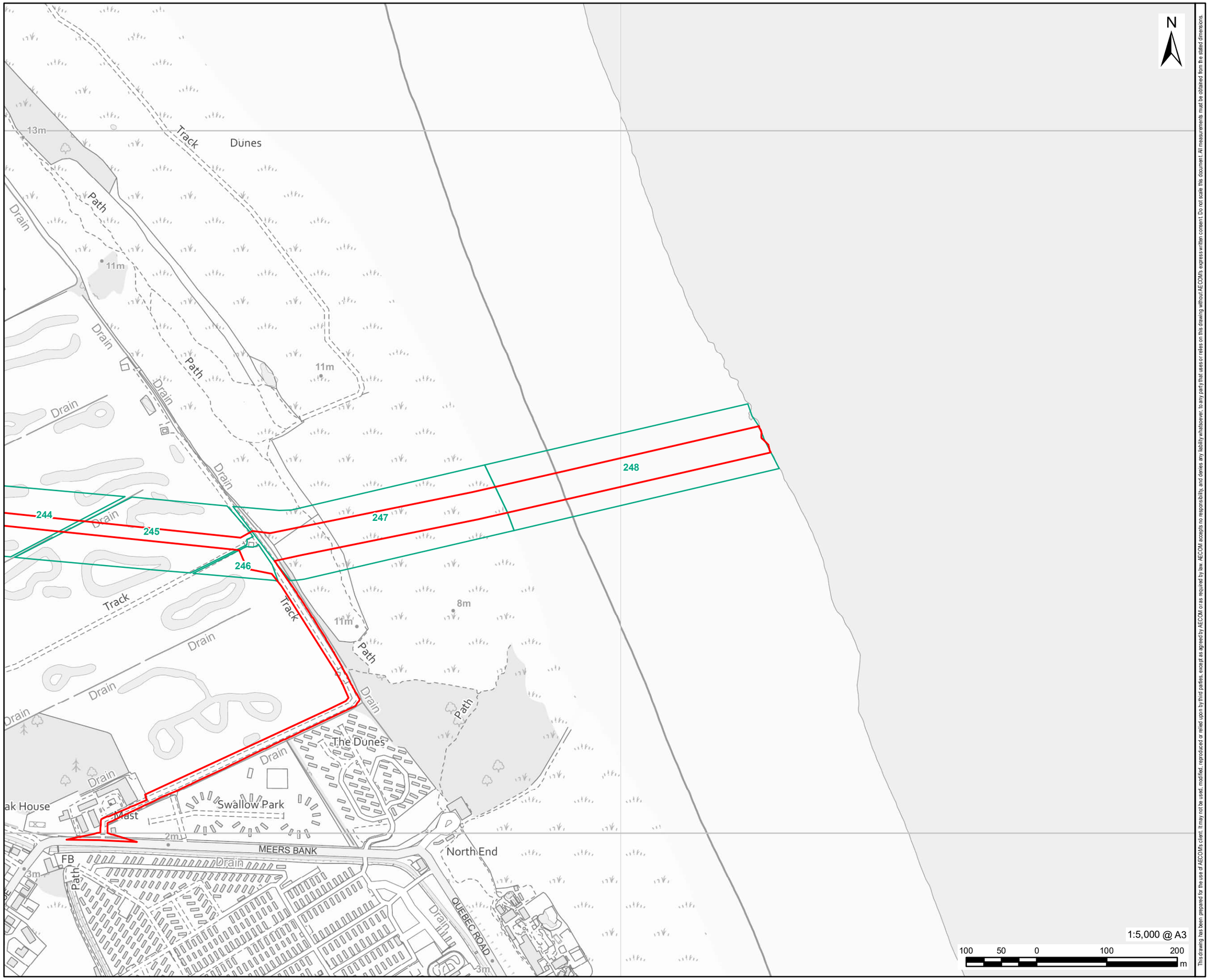

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PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- Geophysical Survey Area - AOC Field Numbers

NOTES:

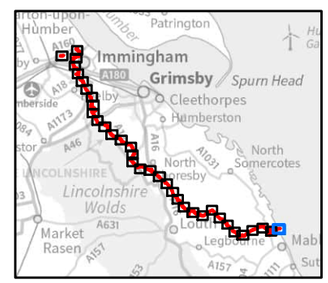

FIGURE TITLE

Figure 3 (34 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

PROJECT NUMBER / REFERENCE

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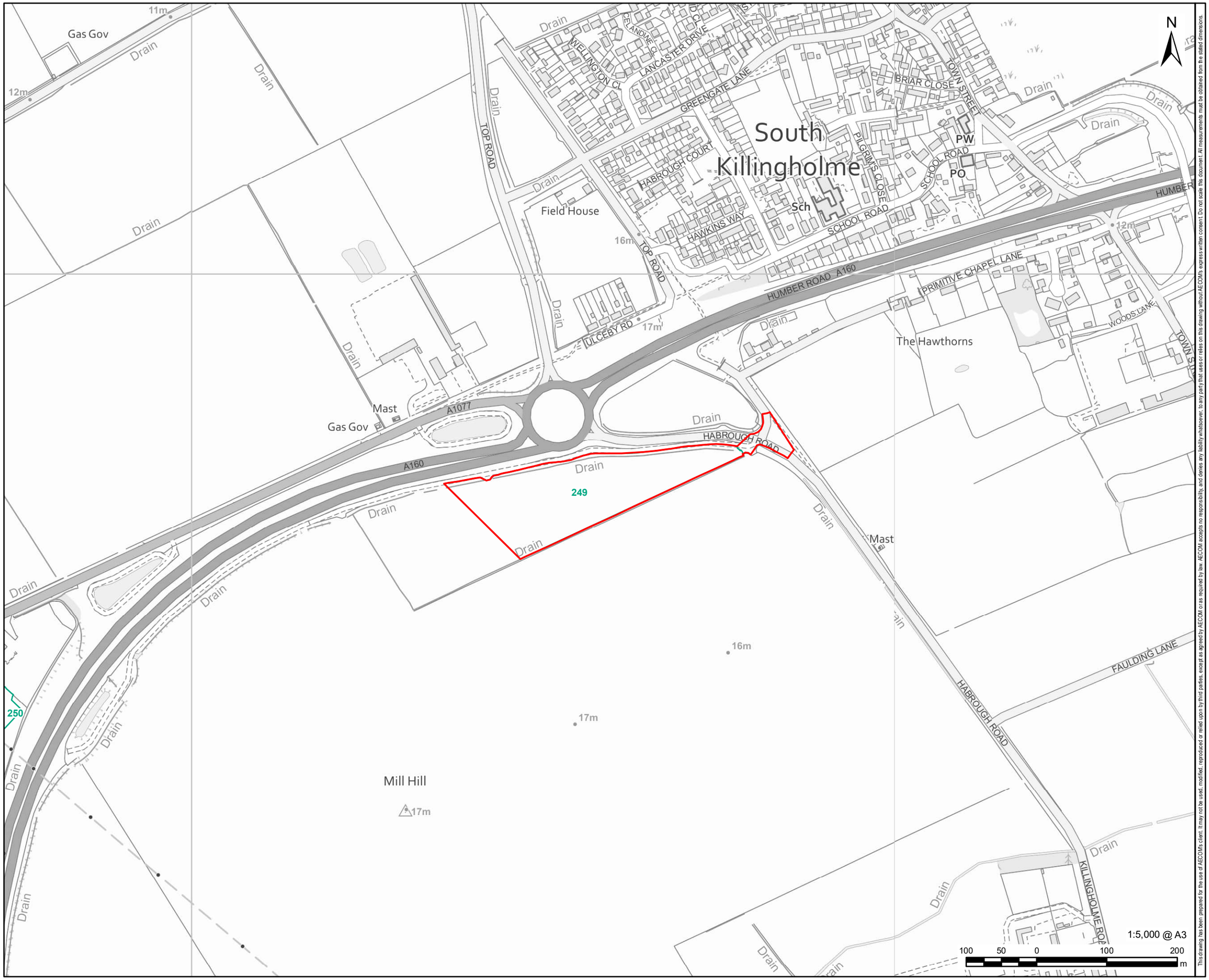

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Viking CCS Pipeline

LEGEND

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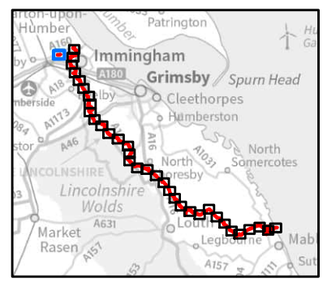

FIGURE TITLE

Figure 3 (35 of 35)
Completed Trench Locations

ISSUE PURPOSE

ARCHAEOLOGICAL MITIGATION STRATEGY

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