

Archaeological Report of Geophysical Survey, Strip, Map and Sample, and Watching Brief

Prepared for: Oak Farming The Farm Office St Helens Farm Seaton Ross YO43 4NP

Prepared by: Wessex Archaeology Unit R6, Sheaf Bank Business Park Prospect Road Sheffield S2 3EN

www.wessexarch.co.uk

May 2015

Report ref. 106120.01



Quality Assurance

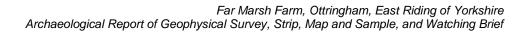
Project Code	106120	Accession Code	n/a	Client Ref.	n/a
Planning Application Ref.		Ordnance Survey (OS) national grid reference (NGR)	524679 421578		

Version	Status*	Prepared by	Checked and Approved By	Approver's Signature	Date
v01	1	AMc			
File:	S:\PROJ	ECTS\106120_Rep	orts\		
v02	1	AKC			
File:	S:\PROJECTS\106120_Reports\V2\				
v03	E	AWT			
File:	S:\PROJECTS\106120_Reports\v03\				
V04	F	AR			
File:	S:\PROJECTS\106120_Reports\V4\				
File:					

* I = Internal Draft; E = External Draft; F = Final

DISCLAIMER

THE MATERIAL CONTAINED IN THIS REPORT WAS DESIGNED AS AN INTEGRAL PART OF A REPORT TO AN INDIVIDUAL CLIENT AND WAS PREPARED SOLELY FOR THE BENEFIT OF THAT CLIENT. THE MATERIAL CONTAINED IN THIS REPORT DOES NOT NECESSARILY STAND ON ITS OWN AND IS NOT INTENDED TO NOR SHOULD IT BE RELIED UPON BY ANY THIRD PARTY. TO THE FULLEST EXTENT PERMITTED BY LAW WESSEX ARCHAEOLOGY WILL NOT BE LIABLE BY REASON OF BREACH OF CONTRACT NEGLIGENCE OR OTHERWISE FOR ANY LOSS OR DAMAGE (WHETHER DIRECT INDIRECT OR CONSEQUENTIAL) OCCASIONED TO ANY PERSON ACTING OR OMITTING TO ACT OR REFRAINING FROM ACTING IN RELIANCE UPON THE MATERIAL CONTAINED IN THIS REPORT ARISING FROM OR CONNECTED WITH ANY ERROR OR OMISSION IN THE MATERIAL CONTAINED IN THE REPORT. LOSS OR DAMAGE AS REFERRED TO ABOVE SHALL BE DEEMED TO INCLUDE, BUT IS NOT LIMITED TO, ANY LOSS OF PROFITS OR ANTICIPATED PROFITS DAMAGE TO REPUTATION OR GOODWILL LOSS OF PROFITS OR ANTICIPATED PROFITS DAMAGE TO ANY THIRD PARTY (IN ALL CASES WHETHER DIRECT INDIRECT OR CONSEQUENTIAL) OR ANY OTHER DIRECT INDIRECT OR CONSEQUENTIAL LOSS OR DAMAGE.





Archaeological Report of Geophysical Survey, Strip, Map and Sample, and Watching Brief

Contents

Summ	nary	. iii
Ackno	wledgements	.iv
1	INTRODUCTION	.1
1.1	Project background	
1.2	Location, topography and geology	
2	ARCHAEOLOGICAL BACKGROUND	. 2
2.1	Introduction	. 2
2.2	Prehistoric and Romano-British	. 2
2.3	Anglo-Saxon to post-medieval	. 2
3	AIMS AND OBJECTIVES	. 3
3.1	Strip, map and sample and watching brief	. 3
4	METHODOLOGY	. 3
4.1	General	. 3
4.2	Geophysical survey	. 3
4.3	Watching brief and strip, map and sample	
4.4	Finds	. 4
5	ARCHAEOLOGICAL RESULTS	. 4
5.1	Geophysical survey	. 4
5.2	Strip, map and sample and watching brief	. 5
6	ARTEFACTUAL EVIDENCE	. 6
6.1	General	. 6
7	DISCUSSION	.7
7.1	Summary	.7
8	ARCHIVE STORAGE AND CURATION	
8.1	Museum	
8.2	Archive	
8.3	Discard policy	
8.4	Security copy	. 7



9	REFERENCES	9
9.1	Bibliography	
10	APPENDICES	11
10.1	Appendix 1: geophysical survey equipment and data processing	11
10.2	Appendix 2: geophysical interpretation	
10.3	Appendix 2: context descriptions	14
10.4	Appendix 4: OASIS Form	

Figures

Figure 1:	Site location and survey extent
-----------	---------------------------------

- Figure 2: Greyscale of geophysical survey
- Figure 3: XY Trace of geophysical survey
- Figure 4: Interpretation of geophysical survey

Plates

Front cover:View facing south-east along Area APlate 1:Representative section of cable trench in Area APlate 2:Plastic land drain correlating with geophysical anomaly 4000

Tables

Table 1: All finds by context

Archaeological Report of Geophysical Survey, Strip, Map and Sample, and Watching Brief

Summary

Wessex Archaeology were commissioned by Oak Farming to undertake an archaeological investigation of land at Far Marsh Farm, Ottringham, East Riding of Yorkshire centred on National Grid Reference 524679 421578. The archaeological work was required in advance of the construction of a wind turbine, cable trench and substation.

The Site has previously been subject to a baseline study of the known cultural heritage assets in the area. A Written Scheme of Investigation outlining the scope of the proposed works was submitted to Dave Evans, Archaeology Manager in the Humber Archaeology Partnership at East Riding of Yorkshire Council for approval prior to the commencement of fieldwork.

The archaeological work comprised a geophysical survey along the line of the cable trench, strip, map and sample of the turbine base and cable trench, and an archaeological watching brief following excavation for a substation.

The only finds came from the excavation of the cable trench. A waste flint flake and an undiagnostic fragment of fired clay were recovered from a shallow layer in an area identified as having an increased magnetic response by the geophysical survey. The finds are of low significance, but the presence of flint does demonstrate potential prehistoric activity in the area. A residual sherd of Romano-British pottery was recovered from a subsoil deposit which also contained modern material. A single geophysical anomaly, interpreted as indicating the presence of possible archaeology, was found to correlate with a plastic land drain. Three modern field boundaries, two of which are extant, were also recorded in the cable trench.

The archive of the archaeological works is currently held at the offices of Wessex Archaeology in Sheffield, under the project code 106120. It is recommended that the project archive be deposited with East Riding of Yorkshire Museums Service at Sewerby Hall Museum under an accession number to be issued upon deposition. An OASIS form, ID number **wessexar1-190148**, has been provisionally completed and will be submitted at the time of deposition.



Archaeological Report of Geophysical Survey, Strip, Map and Sample, and Watching Brief

Acknowledgements

The fieldwork was commissioned by Oak Farming and Wessex Archaeology are grateful to them in this regard. The project was managed for Wessex Archaeology by Richard O'Neill. The geophysical survey was carried out by Matthew Tooke and Phillip Maier with the data processed and interpreted by Garreth Davey. The geophysical work was quality controlled by Dr. Paul Baggaley and Ben Urmston.

The watching brief was carried out by Simon Evans and the strip, map and sample was undertaken by Amy Farrington McCabe and Martyn Cooper. The finds were assessed by Lorraine Mepham.

This report was compiled by Ashley Tuck from drafts by Amy Farrington McCabe and Alex Cassels. The sections of the report referring to the geophysical survey were written by Garreth Davey. Illustrations were completed by Garreth Davey, Alix Sperr and Chris Breeden.



Archaeological Report of Geophysical Survey, Strip, Map and Sample, and Watching Brief

1 INTRODUCTION

1.1 Project background

- 1.1.1 Wessex Archaeology were commissioned by Oak Farming (hereafter 'the client') to undertake an archaeological investigation of land at Far Marsh Farm, Ottringham, East Riding of Yorkshire (hereafter "the Site") centred on National Grid Reference 524679, 421578 (**Figure 1**). The archaeological work was required in advance of the construction of a wind turbine, cable trench and substation. These works form part of an ongoing programme of archaeological works being undertaken ahead of a larger wind turbine development.
- 1.1.2 The Site has previously been subject to a baseline study of the known cultural heritage assets in the area (Humber Archaeology Partnership 2013). A Written Scheme of Investigation (WSI) outlining the scope of the proposed works was submitted to Dave Evans, Archaeology Manager in the Humber Archaeology Partnership at East Riding of Yorkshire Council (hereafter 'ERYC') for approval prior to the commencement of fieldwork (Wessex Archaeology 2014).
- 1.1.3 This report presents a brief description of the methodology followed, the detailed geophysical survey results and archaeological interpretation of the geophysical data, as well as the results of the strip, map and sample and the watching brief. All work undertaken conformed to current best practice and to the guidance (English Heritage 2008; Historic England 2015; ClfA 2014a-e).

1.2 Location, topography and geology

- 1.2.1 The Site occupies a strip of land across two arable fields in the East Riding of Yorkshire, less than 5 km from the River Humber. At the time of the geophysical survey the fields were mostly open and free of obstruction except to the north where some of the survey area had already been turned over.
- 1.2.2 The Site is located on gently sloping arable land sloping from a height of 3 m above Ordnance Datum (aOD) at the eastern end, to 2 m aOD at the western end. The underlying geology of the Site is mapped as chalk of the White Chalk Subgroup, with superficial Tidal Flat deposits of clay and silt (British Geological Survey Sheet 081 Patrington).



2 ARCHAEOLOGICAL BACKGROUND

2.1 Introduction

- 2.1.1 The following section is a summary of information contained in the baseline study produced by Humber Archaeological Partnership (2013).
- 2.1.2 Set within the wetland landscape of the southern Holderness Plain, an area considered to have been extensively exploited throughout history, the land surrounding the Site is regarded as having a particularly high archaeological potential for remains from the early-prehistoric to Romano-British as well as from the medieval and post-medieval periods.

2.2 Prehistoric and Romano-British

2.2.1 Situated on 'islands' of higher ground settlement from the surrounding region the earliest prehistoric activity is represented primarily by findspots comprising worked flint and hand axes, with evidence for extensive exploitation of the landscape since the Mesolithic period. Recent excavations in the area have also provided evidence from later prehistory, with extensive infrastructural projects and aerial photographic surveys revealing a growing number of Bronze Age funerary sites as well as Iron Age and Roman-British settlements.

2.3 Anglo-Saxon to post-medieval

- 2.3.1 It is probable that the Site has been in continual agricultural use from the Anglo-Saxon period onwards.
- 2.3.2 The villages of Ottringham and Keyingham, to the north of the Site, are thought have been established during the Anglo-Saxon periods, with both names derived from Old English. Both villages appear as well established settlements in the Domesday Survey of 1086. The name typology and Domesday estate descriptions suggest a well occupied lowlying landscape, with extensive tracts of meadow interspersed with ploughland and woodland. Documentary sources show that during the early medieval period, between the 12th and 13th centuries, the Site was situated on land within Ottringham Marsh, also known as Monkgarth Ottringham, reclaimed marshland which was granted to the church estates.
- 2.3.3 Ridge and furrow of probable medieval or post-medieval date is recorded across the area and the proposed turbines appear to lie within former field boundaries interpreted as medieval sheep folds and small enclosures. Due to the presence of medieval and post-medieval archaeology, it is possible that these features may obscure older patterns of land use or archaeological features.
- 2.3.4 Map regression showed that the Site has been in use as arable fields from at least the 19th century to present as part of land held by Farr Marsh Farm, a post-enclosure farmstead.
- 2.3.5 Recent trial trenching within 100 m of the site as part of the Humber Gateway project, in advance of groundworks for cable installation, did not identify any deposits or features of archaeological interest in the immediate area (Wessex Archaeology 2015).



3 AIMS AND OBJECTIVES

3.1 Strip, map and sample and watching brief

- 3.1.1 The specific aims of the strip, map and sample and watching brief were:
 - to determine the extent, condition, character, importance and date of any archaeological deposit encountered;
 - to provide sufficient information to enable an informed decision to be made about the need for additional archaeological mitigation;
 - to investigate geophysical anomalies revealed by the previous survey;
 - to produce an accurate comprehensive record and report; and
 - to make available the results of the work.

4 METHODOLOGY

4.1 General

4.1.1 The geophysical survey was undertaken prior to the commencement of below-ground works. The areas of the substation and the turbine base had been excavated by the contractor prior to the arrival of an archaeologist. Monitoring was carried out during excavation of the entire length of the cable trench.

4.2 Geophysical survey

- 4.2.1 The detailed magnetometer survey was conducted using a Bartington Grad601-2 dual fluxgate gradiometer system. The survey was conducted in accordance with English Heritage guidelines (2008).
- 4.2.2 The geophysical survey was undertaken by Wessex Archaeology's in-house geophysics team between 15th and 20th January 2014. Field conditions at the time of the survey were good.
- 4.2.3 Individual survey grid nodes were established at 30 m x 30 m intervals using a Leica Viva RTK GNSS instrument, which is precise to approximately 0.02 m and therefore exceeds English Heritage recommendations (2008).
- 4.2.4 The magnetometer survey was conducted using a Bartington Grad601-2 fluxgate gradiometer instrument, which has a vertical separation of 1 m between sensors. Data were collected at 0.25 m intervals along transects spaced 1 m apart with an effective sensitivity of 0.03 nT, in accordance with EH guidelines (2008). Data were collected in the zigzag method.
- 4.2.5 Data from the survey was subject to minimal data correction processes. These comprise a zero mean traverse function (±5 nT thresholds) applied to correct for any variation between the two Bartington sensors used, and a de-step function to account for variations in traverse position due to varying ground cover and topography. These two steps were applied to all survey areas, with no interpolation applied.
- 4.2.6 Further details of the geophysical and survey equipment, methods and processing are described in **Appendices 1** and **2**.

4.3 Watching brief and strip, map and sample



- 4.3.1 Detailed methodology for the work can be found in the WSI (Wessex Archaeology 2014). Wessex Archaeology procedures conform to industry best practice, as outlined in the standards and guidance documentation issued by the CIfA (CIfA 2014a-e) and relevant local and regional frameworks.
- 4.3.2 Prior to Wessex Archaeology arriving on site the areas for the substation (Watching Brief) had been excavated and backfilled while the area of the turbine base (Strip, Map and Sample) had been partially excavated. Monitoring of the turbine base was carried out on 16th September 2014 while the cable trench was monitored between the 21st and 24th October 2014.
- 4.3.3 Subsequently, monitoring was carried out during excavation of the cable trench. Topsoil and overburden were removed using a mechanical excavator fitted with a toothless ditching bucket and monitored at all times by a suitably experienced archaeologist.
- 4.3.4 The exposed surfaces were hand-cleaned as necessary to clarify the extent of any revealed archaeological remains. All spoil and fills were scanned to retrieve finds.
- 4.3.5 All archaeological features and deposits encountered were recorded using Wessex Archaeology's *pro forma* recording sheets and a continuous unique numbering system.
- 4.3.6 Excavated areas were located by means of a RTK GPS system and tied into the OS grid (within 0.1m). Plans, sections and elevations of archaeological features and deposits were drawn as necessary at 1:10, 1:20 and 1:50 as appropriate. All drawings were made in pencil on permanent drafting film.
- 4.3.7 The spot height of all principal features and levels was calculated in metres relative to Ordnance Datum, correct to two decimal places. Plans, sections and elevations are annotated with spot heights as appropriate.
- 4.3.8 Photographs were taken of all archaeological features to produce a photographic record consisting of 35 mm monochrome and colour digital images (at least 10 megapixel). All record shots are on 35 mm monochrome film.

4.4 Finds

4.4.1 Finds were treated in accordance with the relevant industry guidance (English Heritage 2005, Watkinson and Neal 1998). All artefacts from excavated contexts were retained, except those from features or deposits of obviously modern date. All retained artefacts were washed, weighed, counted and identified. All artefacts were recorded by context, with summary listing of artefacts by category to provide simple quantification. Artefacts were analysed and reported by specialists.

5 ARCHAEOLOGICAL RESULTS

5.1 Geophysical survey

General

5.1.1 The gradiometer survey was successful in identifying anomalies of possible archaeological interest across the Site, along with a number of modern services. Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at



a scale of 1:2,000. The data are displayed at -2 nT (white) to +3 nT (black) for the greyscale image and ± 25 nT at 25 nT per cm for the XY trace plots.

- 5.1.2 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends.
- 5.1.3 Numerous ferrous anomalies are visible throughout the detailed survey dataset. These are presumed to be modern in provenance and are not referred to, unless considered relevant to the archaeological interpretation.

Gradiometer survey results and interpretation

- 5.1.4 The only area of possible archaeological interest was identified in the southern most area of the survey. Anomaly 4000 is highlighted as a positive magnetic anomaly which is interpreted as representing a possible east-west linear feature. However, the anomaly is largely ephemeral and given the small survey area it is unclear whether it continues to the east or west. A further weaker linear anomaly is present running from north-west to southeast just to the south of 4000 (**Figures 2-4**).
- 5.1.5 Anomalies interpreted as evidence of ploughing were visible across the survey area and areas of increased magnetic response were also identified.

5.2 Strip, map and sample and watching brief *Introduction*

5.2.1 The following section provides a summary of the information held in the Site archive, with a full list of context numbers and context descriptions contained in **Appendix 3**.

General stratigraphy

- 5.2.2 The general stratigraphy was uniform across the Site (**Plate 1**). The undisturbed natural geology was orangish or yellowish brown silty sand or loam e.g. 203. In the area of the turbine base, the monitored excavations were not deep enough (halting at a maximum of 0.4 m) to reach natural. A dark brown silty sand relic plough soil classified as the subsoil e.g. 102 was seen in all areas of the Site. The base of the subsoil was generally at 0.4 m below ground level (blg) but was occasionally 0.6 m bgl. Modern ceramic building material (CBM) and residual Romano-British pottery were recovered from subsoil 302. The topsoil e.g. 101 was a dark greyish brown silty sand, measuring 0.15 m to 0.2 m in depth.
- 5.2.3 19th century land drains were observed across the Site, at a depth of *c*.1.1 m BGL, with a greater density of land drains in the south. These land drains appear to correlate with the "ploughing" anomalies identified by the geophysical survey.

Prehistoric

5.2.4 The southern 35 m of Area C contained a shallow layer 403 below the subsoil 402 and above the natural 404, only seen in section. Layer 403 was mid-orangey brown silty clay, similar to the natural, and likely represents a soil horizon. 403 correlates with a larger area of increased magnetic response identified by the geophysical survey. A prehistoric flint waste flake and an undated and undiagnostic fragment of fired clay were recovered from 403.

Modern



- 5.2.5 In Area A, a positive magnetic anomaly was identified during the geophysical survey. Geophysical anomaly **4000** was interpreted as being a possible east-west linear archaeological feature. Upon excavation it was revealed to be a modern land drain, comprising blue corrugated plastic piping, surrounded by compact white gravel aggregates (**Plate 2**).
- 5.2.6 A modern drainage ditch 204 measuring *c*.5 m wide and *c*.2 m deep and aligned northeast to south-west, divided Areas A and B. The full extent of the ditch was not visible due to vegetation and water.
- 5.2.7 An east to west aligned modern drainage ditch 307 measuring c.5 m wide and c.2 m deep divided Areas B and C,. The ditch was filled with vegetation and water. Ditch 307 was observed to be a re-cut of an earlier ditch 305 extending to 2.2 m BGL and with a shallow silvery grey sandy silty clay fill with black organic material inclusions 306.
- 5.2.8 A former drainage ditch 406 visible on Ordnance Survey mapping (**Figure 1**) was observed within Area C. It measured 0.7 m deep and 3 m wide and was primarily filled with greyish black silty detritus 407, heavily waterlogged and containing extensive plant remains and plastic sacks.

6 ARTEFACTUAL EVIDENCE

By Lorraine Mepham

6.1 General

6.1.1 Finds were recovered from two contexts 302, 403 during the Strip, Map and Sample of the cable trench. These comprised worked flint, pottery, fired clay and ceramic building material. Quantities by material type and by context are given in **Table 1** below.

Context	Pottery	СВМ	Fired Clay	Worked Flint
302	1/14	4/26		
403			1/6	1/10
TOTALS	1/14	4/26	1/6	1/10

Table 1: All finds by context (number / weight in grams)

- 6.1.2 The single sherd of pottery, an undiagnostic body sherd, is a grog-tempered ware of Romano-British date. It was a residual find in context 302, associated with post-medieval CBM. The latter consists of one small but diagnostic brick fragment and three very small undiagnostic fragments, lacking any surviving surfaces, but almost certainly also Post-medieval brick or roof tile fragments.
- 6.1.3 The worked flint comprises a prehistoric waste flake. It is not more closely datable within the prehistoric period. A small fragment of fired clay from the same context 403 is completely undiagnostic and undatable.



6.1.4 Given the quantity of objects recovered, their nature and date range, retention for longterm curation is not recommended, and the finds will be discarded prior to archive deposition.

7 DISCUSSION

7.1 Summary

- 7.1.1 A prehistoric waste flint flake and an undiagnostic and undated fragment of fired clay were recovered from a shallow soil horizon in an area identified as having an increased magnetic response by the geophysical survey. The finds are of low significance, but demonstrate the potential for prehistoric activity in the area.
- 7.1.2 A residual sherd of Romano-British pottery was recovered from a subsoil deposit which also contained modern material.
- 7.1.3 A single geophysical anomaly was interpreted as indicating the presence of possible archaeology. This was found to correlate with a plastic land drain.
- 7.1.4 Three modern field boundaries, two of which are still extant, were also recorded.
- 7.1.5 Given the largely negative results, it is likely that the Site lay some distance from any historic settlement.

8 ARCHIVE STORAGE AND CURATION

8.1 Museum

8.1.1 It is recommended that the project archive resulting from the excavation be deposited with East Riding of Yorkshire Museums Service at Sewerby Hall Museum. An accession number will be issued upon deposition.

8.2 Archive

- 8.2.1 The complete Site archive, which will include paper records, photographic records, graphics, artefacts, and digital data, will be prepared following the standard conditions for the acceptance of excavated archaeological material by the East Riding of Yorkshire Museums Service, and in general following nationally recommended guidelines (SMA 1995; ClfA 2014d; Brown 2011; ADS 2013).
- 8.2.2 All archive elements will be marked with the accession code, and a full index will be prepared.

8.3 Discard policy

8.3.1 Wessex Archaeology follows the guidelines set out in Selection, Retention and Dispersal (Society of Museum Archaeologists 1993), which allows for the discard of selected artefact and ecofact categories which are not considered to warrant any future analysis. Any discard of artefacts will be fully documented in the project archive.

8.4 Security copy

8.4.1 In line with current best practice (e.g. Brown 2011); on completion of the project a security copy of the written records will be prepared, in the form of a digital PDF/A file. PDF/A is an

ISO-standardised version of the Portable Document Format (PDF) designed for the digital preservation of electronic documents through omission of features ill-suited to long-term archiving.



9 **REFERENCES**

9.1 Bibliography

- ADS, 2013, Caring for Digital Data in Archaeology: a guide to good practice, Archaeology Data Service & Digital Antiquity Guides to Good Practice
- Brown, D.H., 2011, Archaeological archives; a guide to best practice in creation, compilation, transfer and curation, Archaeological Archives Forum (revised edition)
- Chartered Institute for Archaeologists (CIfA), 2014b, Standard and Guidance for Watching Brief
- Chartered Institute for Archaeologists (CIfA), 2014b, Standard and Guidance for Excavation
- Chartered Institute for Archaeologists (ClfA), 2014c, Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials
- Chartered Institute for Archaeologists (CIfA), 2014d, Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives
- Chartered Institute for Archaeologists (ClfA), 2014e, Code of Conduct
- English Heritage, 2005, A Strategy for the Care and Investigation of Finds
- English Heritage, 2008. Geophysical Survey in Archaeological Field Evaluation. Research and Professional Service Guideline No 1, 2nd edition
- Historic England, 2015. Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide
- Humber Archaeological Partnership, 2013, Letter report Re: Erection of a substation building and electricity cable to facilitate supply of renewable energy to the grid. At Far Marsh farm, Marsh Road, Ottringham, East Riding of Yorkshire. Unpublished client letter report
- Watkinson, D. and Neal, V. (eds.), 1998, First Aid for Finds: Practical Guide for Archaeologists. United Kingdom Institute for Conservation of Historic & Artistic Works, Archaeology Section; 3rd Revised Edition
- Society of Museum Archaeologists (SMA), 1993, Selection, Retention and Dispersal of Archaeological Collections, Society of Museum Archaeologists
- Society of Museum Archaeologists (SMA), 1995, Towards an Accessible Archaeological Archive, Society of Museum Archaeologists
- Wessex Archaeology, 2014, Far Marsh Farm, Ottringham, East Riding of Yorkshire: Written Scheme of Investigation for Archaeological Strip, Map and Sample and Watching Brief. Unpublished client report ref T18715.02



Wessex Archaeology, 2015, Humber Gateway Onshore Cable Route, Easington to Salt End, East Yorkshire: Post-Excavation Assessment Report and Updated Project Design. Unpublished client report ref 76814.01



10 APPENDICES

10.1 Appendix 1: geophysical survey equipment and data processing

Survey Methods and Equipment

The magnetic data for this project was acquired using a Bartington 601-2 dual magnetic gradiometer system. This instrument has two sensor assemblies fixed horizontally 1m apart allowing two traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 1m separation, and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

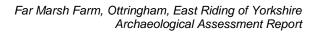
The gradiometers have an effective resolution of 0.03nT over a $\pm 100nT$ range, and measurements from each sensor are logged at intervals of 0.25m. All of the data are stored on an integrated data logger for subsequent post-processing and analysis.

Wessex Archaeology undertakes two types of magnetic surveys: scanning and detail. Both types depend upon the establishment of an accurate 20m or 30m site grid, which is achieved using a Leica Viva RTK GNSS instrument and then extended using tapes. The Leica Viva system receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined with a precision of 0.02m in real-time and therefore exceed the level of accuracy recommended by English Heritage (2008) for geophysical surveys.

Scanning surveys consist of recording data at 0.25m intervals along transects spaced 10m apart, acquiring a minimum of 80 data points per transect. Due to the relatively coarse transect interval, scanning surveys should only be expected to detect extended regions of archaeological anomalies, when there is a greater likelihood of distinguishing such responses from the background magnetic field.

The detailed surveys consist of 20m x 20m or 30m x 30m grids, and data are collected at 0.25m intervals along traverses spaced 1m apart. These strategies give 1600 or 3600 measurements per 20m or 30m grid respectively, and are the recommended methodologies for archaeological surveys of this type (EH, 2008).

Data may be collected with a higher sample density where complex archaeological anomalies are encountered, to aid the detection and characterisation of small and ephemeral features. Data may be collected at up to 0.125m intervals along traverses spaced up to 0.25m apart, resulting in a maximum of 28800 readings per 30m grid, exceeding that recommended by English Heritage (2008) for characterisation surveys.





Post-Processing

The magnetic data collected during the detail survey are downloaded from the Bartington system for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

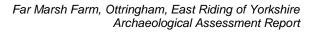
As the scanning data are not as closely distributed as with detailed survey, they are georeferenced using the GPS information and interpolated to highlight similar anomalies in adjacent transects. Directional trends may be removed before interpolation to produce more easily understood images.

Typical data and image processing steps may include:

- Destripe Applying a zero mean traverse in order to remove differences caused by directional effects inherent in the magnetometer;
- Destagger Shifting each traverse longitudinally by a number of readings. This corrects for operator errors and is used to enhance linear features;
- Despike Filtering isolated data points that exceed the mean by a specified amount to reduce the appearance of dominant anomalous readings (generally only used for earth resistance data)

Typical displays of the data used during processing and analysis:

- XY Plot Presents the data as a trace or graph line for each traverse. Each traverse is displaced down the image to produce a stacked profile effect. This type of image is useful as it shows the full range of individual anomalies.
- Greyscale Presents the data in plan view using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.





10.2 Appendix 2: geophysical interpretation

The interpretation methodology used by Wessex Archaeology separates the anomalies into two main categories: archaeological and unidentified responses.

The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further subdivided into three groups, implying a decreasing level of confidence:

- Archaeology used when there is a clear geophysical response and anthropogenic pattern.
- Probable archaeology used for features which give a clear response but which form incomplete patterns.
- Possible archaeology used for features which give a response but which form no discernible pattern or trend.

The unidentified category is used for features when the form, nature and pattern of the anomaly are not sufficient to warrant a classification as an archaeological feature. This category is further sub-divided into:

- Increased magnetic response used for areas dominated by indistinct anomalies which may have some archaeological potential.
- Trend used for low amplitude or indistinct linear anomalies.
- Ferrous used for responses caused by ferrous material. These anomalies are likely to be of modern origin.

Finally, services such as water pipes are marked where they have been identified.



10.3 Appendix 2: context descriptions

Context	Description	Depth BGL (m)
	Turbine Base	Max depth 0.4m
101	Topsoil: Dark greyish brown silty sand, moderately compact, containing post-medieval and 19th century ceramic, high organic content, recently spread with manure	0-0.15
102	Subsoil: Dark brown silty sand, moderately compact, frequent rooting and organic remains.	0.15+
	Area A	Max Depth: 1.2m
201	Topsoil: Dark greyish brown silty sand, moderately compact, containing post-medieval and 19th century ceramic, high organic content, recently spread with manure	0-0.2
202	Subsoil: Dark brown silty sand, moderately compact, frequent rooting and organic remains.	0.2-0.4
203	Natural: Light orangey brown silty sandy clay, with lensing of light grey and yellow silty sand, infrequent ironstone inclusions c. 2-5mm in size and poorly sorted (<2%)	0.4+
204	Cut: Cut for drainage ditch, over 2m in depth and approximately 5m in width. In filled with vegetation and water, straight sides (approximately 45 angle) with probable concave base	0-2+
	Area B	Max Depth: 2.2m+
301	Topsoil: Dark greyish brown silty sand, moderately compact, containing post-medieval and 19th century ceramic, high organic content, recently spread with manure	0- 0.2
302	Subsoil: Dark brown silty sand, moderately compact, frequent rooting and organic remains.	0.2-0.4/0.5
303	Natural: Light orangey brown silty sandy clay, with lensing of light grey and yellow silty sand, infrequent ironstone inclusions c. 2-5mm in size and poorly sorted (<2%)	0.4/0.5+
304	Natural: Dark brown yellow silty sand with grey clay lensing	1+
305	Cut: Original cut of drainage ditch, concave base, sides of cut truncated by later cut of ditch with only the base visible. Due to the depth of feature, accurate measurements could not be taken	2.2+
306	Fill: Fill of cut 305, sandy silty clay, silvery grey in colour with black organic material inclusions	2-2.2
307	Cut: Recut of drainage ditch approximately 2m in depth and approximately 5m in width. In filled with vegetation and water, straight sides (approximately 45 angle) with concave base	0-2
	Area C	Max Depth:1.2m
401	Topsoil: Dark greyish brown silty sand, moderately compact, containing post-medieval and 19th century ceramic, high organic content, recently spread with manure	0-0.2
402	Subsoil: Dark brown silty sand, moderately compact, frequent rooting and organic remains.	0.2- (0.4-0.6)
403	Layer: Mid orangey brown silty clay, moderately compact containing flint and fired clay fragment extending for 35m to the northwest of ditch 307	0.5-0.6
404	Natural: Light orangey brown silty sandy clay, with lensing of light grey and yellow silty sand, infrequent ironstone inclusions c. 2-5mm in size and poorly sorted (<2%)	0.6-0.8
405	Layer: Dark brown yellow silty sand with grey clay lensing	0.8+
406	Cut: former drainage ditch approximately 0.7m in depth and 3m in width visible in trench	0.5-1.2+
407	Fill: Fill of ditch 406, greyish black silty detritus, heavily waterlogged	0.9-1.2

Context	Description	Depth BGL (m)
	containing extensive plant remains with modern plastic inclusions (plastic animal feed bags)	
408	Fill: Fill of ditch 406, silty sandy clay, mid dark brown, backfill of ditch	0.5-0.9



10.4 Appendix 4: OASIS Form

OASIS ID: wessexar1-190148

Project details	
Project name	Far Marsh Farm, Ottringham, East Riding of Yorkshire
Short description of the project	Wessex Archaeology were commissioned by Oak Farming (hereafter 'the client') to undertake an archaeological investigation of land at Far Marsh Farm, Ottringham, East Riding of Yorkshire (hereafter
Project dates	Start: 16-09-2014 End: 24-10-2014
Previous/future work	Yes / Not known
Any associated project reference codes	106120 - Sitecode
Any associated project reference codes	DC/14/00542/PLF/EASTSE - Planning Application No.
Type of project	Recording project
Site status	None
Current Land use	Grassland Heathland 2 - Undisturbed Grassland
Monument type	NONE None
Significant Finds	FLINT Late Prehistoric
Significant Finds	CERAMIC Roman
Investigation type	"Part Excavation","Watching Brief"
Deserve	
Prompt	Planning condition
Prompt Project location	Planning condition
	England
Project location	-
Project location Country	England EAST RIDING OF YORKSHIRE EAST RIDING OF YORKSHIRE
Project location Country Site location	England EAST RIDING OF YORKSHIRE EAST RIDING OF YORKSHIRE OTTRINGHAM Far Marsh Farm, Ottringham, East Riding of Yorkshire
Project location Country Site location Postcode	England EAST RIDING OF YORKSHIRE EAST RIDING OF YORKSHIRE OTTRINGHAM Far Marsh Farm, Ottringham, East Riding of Yorkshire HU12 0AL
Project location Country Site location Postcode Study area	England EAST RIDING OF YORKSHIRE EAST RIDING OF YORKSHIRE OTTRINGHAM Far Marsh Farm, Ottringham, East Riding of Yorkshire HU12 0AL 0 Square metres TA 526500 424500 53.855556498 0.32116601023 53 51 20 N 000 19 16 E
Project location Country Site location Postcode Study area Site coordinates	England EAST RIDING OF YORKSHIRE EAST RIDING OF YORKSHIRE OTTRINGHAM Far Marsh Farm, Ottringham, East Riding of Yorkshire HU12 0AL 0 Square metres TA 526500 424500 53.855556498 0.32116601023 53 51 20 N 000 19 16 E
Project location Country Site location Postcode Study area Site coordinates Project creators	England EAST RIDING OF YORKSHIRE EAST RIDING OF YORKSHIRE OTTRINGHAM Far Marsh Farm, Ottringham, East Riding of Yorkshire HU12 0AL 0 Square metres TA 526500 424500 53.855556498 0.32116601023 53 51 20 N 000 19 16 E Point
 Project location Country Site location Postcode Study area Site coordinates Project creators Name of Organisation 	England EAST RIDING OF YORKSHIRE EAST RIDING OF YORKSHIRE OTTRINGHAM Far Marsh Farm, Ottringham, East Riding of Yorkshire HU12 0AL 0 Square metres TA 526500 424500 53.855556498 0.32116601023 53 51 20 N 000 19 16 E Point Wessex Archaeology
 Project location Country Site location Postcode Study area Site coordinates Project creators Name of Organisation Project brief originator Project design 	England EAST RIDING OF YORKSHIRE EAST RIDING OF YORKSHIRE OTTRINGHAM Far Marsh Farm, Ottringham, East Riding of Yorkshire HU12 0AL 0 Square metres TA 526500 424500 53.855556498 0.32116601023 53 51 20 N 000 19 16 E Point Wessex Archaeology East Riding of Yorkshire Council
 Project location Country Site location Postcode Study area Site coordinates Project creators Name of Organisation Project brief originator Project design originator Project 	England EAST RIDING OF YORKSHIRE EAST RIDING OF YORKSHIRE OTTRINGHAM Far Marsh Farm, Ottringham, East Riding of Yorkshire HU12 0AL 0 Square metres TA 526500 424500 53.855556498 0.32116601023 53 51 20 N 000 19 16 E Point Wessex Archaeology East Riding of Yorkshire Council Wessex Archaeology

106120.01



Name of Oak Farming sponsor/funding body

Project archives	
Physical Archive Exists?	No
Digital Archive recipient	East Riding of Yorkshire Museum Service
Digital Contents	"none"
Digital Media available	"Images raster / digital photography","Survey"
Paper Archive recipient	East Riding of Yorkshire Museum Service
Paper Contents	"Ceramics","Worked stone/lithics"
Paper Media available	"Context sheet","Diary","Photograph","Plan","Report"
Project bibliography 1	
Publication type	Grey literature (unpublished document/manuscript)
Title	Far Marsh Farm, Ottringham, East Riding of Yorkshire Archaeological Report of Geophysical Survey, Strip, Map and Sample, and Watching Brief
Author(s)/Editor(s)	Tuck, A., Davey, G. et al
Other bibliographic details	106120.01
Date	2015
Issuer or publisher	Wessex Archaeology
Place of issue or publication	Sheffield
Description	A4 comb bound laser printed report
Entered by	Ashley Tuck (a.tuck@wessexarch.co.uk)
Entered on	8 May 2015