



cambridgeshirearchaeology archaeological field unit

CAM ARC Report Number 960

Wryde Croft Wind Farm, Thorney, Peterborough

Desk-Based Assessment

Scott Kenney and Stephen Kemp

August 2007

Commissioned by Renewable Energy Systems UK Limited

CAM ARC Report Number 960

Wryde Croft Wind Farm, Thorney, Peterborough

Desk-Based Assessment

Scott Kenney and Stephen Kemp BA MSc MIFA

With contributions by Rog Palmer MA MIFA

Site Code: THO WRC 07 Date of works: August 2007 Grid Ref: TF 330075

Editor: Toby Gane MPhil AIFA Illustrator: Séverine Bézie BA MA

CAM ARC OASIS Report Form

OASIS Number:

PROJECT DETAILS					
Project name	Desk-Based Assess	ment at Wr	ryde Croft, T	horney, Peterborough	1
Short description	settlement, farmstea Record evidence ha archaeology. The e	ads and fiel s been use vidence sug	d systems. A d to model t ggests that v	he potential extent an	d Historic Environment
Project dates	Start	25/07/0)7	End	06/08/07
Previous work		20/01/0		Future work	unknown
Associated project reference codes	THO WRC 07				
Type of project	DBA				
Site status	SAM 20801				
Current land use (list all that apply)	Agricultural				
Planned development	Wind Farm				
Monument types / period (list all that apply and use thesaurus of monument types) Significant finds:	Field Systems, Rom Pottery, Roman	an			
Artefact type / period (list all that apply and use <u>MDA</u> <u>object thesaurus</u>)					
PROJECT LOCATION	1				
County	Peterborough		Parish	The	orney
HER for region	Peterborough				
Site address (including postcode)					
Study area (sq.m or ha)	240ha				
National grid reference	Easting (6 figure)	533000)	Northing (6 figure)	307500
Height OD	Max OD	3m		Min OD	1m
PROJECT ORIGINATORS					
Organisation	Cambridgeshire Cou	unty Counci	il, CAM ARC)	
Project brief originator	Peterborough City A	rchaeologi	cal Service		
Project design originator	Toby Gane				
Director/supervisor	Scott Kenney				
Project manager	Toby Gane				
Sponsor or funding body	Renewable Energy	Systems UI	K Limited		
ARCHIVES	Location and acces	ssion num	ber	Content (e.g. po	ttery, animal bone,
				database, conte	
Physical					
Physical Paper					
Physical Paper Digital					
Physical Paper Digital				database, conte	xt sheets etc)
Physical Paper Digital	Wryde Croft Wind F	arm, Thorn			xt sheets etc)
Physical Paper Digital BIBLIOGRAPHY Full title Report number	Wryde Croft Wind F	arm, Thorn		database, conte	xt sheets etc)
Physical Paper Digital BIBLIOGRAPHY Full title Report number				database, conte	xt sheets etc)
Physical Paper Digital BIBLIOGRAPHY Full title Report number Series title and volume	960			database, conte	xt sheets etc)
Physical Paper Digital BIBLIOGRAPHY	960 CAM ARC report se	ries	ey, Peterbor	database, conte	xt sheets etc)

Summary

The archaeological desk-based assessment indicates an area rich in Romano-British settlement, farmsteads and field systems. Aerial photographic and Historic Environment Record evidence has been used to model the potential extent and complexity of the archaeology. The evidence suggests that wherever the turbines are located in the subject area there is the potential to impact on archaeological deposits.

Aerial photographic interpretation suggests that there may be scope for a mitigation strategy allowing for the avoidance of particularly complex areas of archaeology, however this technique only shows part of the picture. Other archaeology such as pits, post-holes and gullies representing buildings are likely to be invisible at this scale and with these methods. It is clear that the archaeological model needs to be further refined to aid in the siting of turbines. In the first instance a geophysical survey and evaluation of areas proposed for disturbance would enhance existing understanding of the archaeological resource.

Contents

1	Introd	luction	1
	1.1	Planning Background	1
	1.2	Location, Topography and Geology	1
2	Archa	eological and Historical Sources	1
	2.1	Historical Sources	2
	2.2		2
	2.3	Cartographic Evidence	2
	2.4	Aerial Photographs	3
	2.5		3
	2.6	Archaeological Excavations and Surveys	3
3	Officia	al Designations	3
4	Archa	eological and Historical Background	4
	4.1	Bronze Age	4
	4.2	Iron Age	4
	4.3	Roman	4
	4.4	Saxon	4
	4.5	Medieval	5
	4.6	Site-Specific Background	5
	4.7	Previous Archaeological Work	5
5	Confic	dence Rating	6
	5.1	Historical Sources	6
	5.2	The Historic Environment Record (formerly SMR)	6
	5.3	Cartographic Evidence	6
	5.4	Aerial Photographs	6
	5.5	Earthworks	7
	5.6	Archaeological Excavations and Surveys	7
6	Depos	sit Mapping of Archaeological Remains	7
7	Degre	e of Survival of Archaeological Remains	8
8	Rating	g	8
9	Concl	usions	9
	Ackno	owledgements	12

Bibliography	12
Maps Consulted	12
List of Appendices	
Appendix 1: Summary of HER Entries	13
Appendix 2: Environmental Impact Statement	15
Appendix 3: Aerial Photographic Assessment by Rog Palmer	18
List of Figures	
Figure 1: Location of the development area	

Figure 1:Location of the development areaFigure 2:HER entries around the study areaFigure 3:Cropmarks, turbines and developm

Cropmarks, turbines and development area overlain on 3-D surface model

1 Introduction

1.1 Planning Background

Renewable Energy Systems UK Ltd commissioned a desk-based study from CAM ARC, Cambridgeshire County Council (formerly Archaeological Field Unit). The aim of this assessment is to determine the archaeological potential of the site at Wryde Croft Farm, Thorney, Peterborough and the likely impact that the proposed location of seven wind turbines will have on this resource, prior to redevelopment.

In addition to the turbines the proposals include access tracks, a substation, a temporary construction compound with widening of existing tracks, and some watercourse crossings. The potential effect of these works on archaeology has been included in this assessment.

Approximately 240ha of farmland have been defined as the site area with aerial photographic mapping extending up to 100m beyond the margins. Archaeological records were collected for an area up to 2km from the proposed site in order to give a thorough basis for deposit predictions.

The work contained in this document is entirely produced from a deskbased assessment and does not include any data from physical investigation at the proposed development site.

1.2 Location, Topography and Geology

The proposed development site is located at Wryde Croft within Inkerson Fen, north-west of Thorney and east of Parson Drove. Malice Farm (TF324085) and Gold Dike Farm (TF327070) are contained within the outline of the site area. (Fig.1). It is centred at TF330075, at a height of approximately 1.5m OD. The proposed wind farm lies entirely within the boundary of the Peterborough City Council unitary authority.

The subject area consists of drained fenlands with the infill deposits of former river channels that date back to the Bronze Age. The underlying geology comprises Barroway Drove Beds overlying the pre-Flandrian geology of Oxford Clay (British Geological Survey 1984). **2 Historical and Archaeological Sources**

The aim of the assessment is to undertake a wide-ranging survey of the local records held by the County and City Councils Historic Environment Records (HERs) and Local Record Offices, to investigate the historic record for the area. As part of this process the aerial photographic resource was re-assessed and re-mapped. Relevant texts from the English Heritage Fenland Survey were used to provide an environmental and archaeological landscape context to aid site prediction and deposit mapping.

2.1 Historical Sources

During the course of these investigations CAM ARC has consulted:

Cambridgeshire County Council Historic Environment Record (CHER) and County Record Office (CRO) Peterborough City Council Historic Environment Record (PHER) Cambridge University Committee for Aerial Photography (CUCAP) National Monuments Record (NMR) Fenland Survey Documentation

A site visit was undertaken on the 25th November 2003 the results of which are outlined below in section 4.6.

2.2 The Historic Environment Record (formerly SMR)

Data was gathered from the Cambridgeshire and Peterborough HER's.

The results of this research indicate an extensive series of Roman cropmarks that extend beyond the boundaries of the site (see Appendix 1 and fig 1). The interpretation of the HER data is of a landscape of small scattered farmsteads, droveways and fieldsystems lying to the northeast of the roddon. To the north of Chestnut Farm lie cropmarks and earthworks also of Roman date suggesting an extensive settlement area. This area in particular has been given Scheduled Ancient Monument status.

HER data highlighted the presence of a monastic Grange sited within Wryde Croft in the fourteenth century (PHER 08265). The precise location of this site is currently unclear.

Beyond the boundaries of the site the majority of the remains are shown as cropmarks and are either of Roman or unknown date. Small amounts of Bronze Age material have been recovered to the southwest and a World War II aircraft has been excavated to the west.

Those references occurring within the development are highlighted in bold.

2.3 Cartographic Evidence

The Cambridge County Record Office holds records for the area dating back to 1652. Hare's map of 1652 (CRO R71/81) indicates a series of divided and drained fields in a regular linear pattern. No farms or

buildings are marked within the area, although they do occur to the west along the course of what is now the B1167.

By 1732 Halsey had recorded the presence of farms at Malice and Gold Dike, suggesting an organised post-medieval expansion of settlement into this part of the fens, occupation of which had not been seen since Roman times.

The OS 2nd edition 1:2500 shows the land as a series of large enclosed fields of approximately 15 - 16 ha in size. These have been laid out in a combination of east-west and north-south directions in much the same way as they were shown in 1652. At this time Chestnut Farm was listed as Malice Farm and the scheduled area, lying out side of the site area, is shown as pasture with the occasional trees.

2.4 Aerial Photographs

An aerial photographic assessment and replotting of aerial photographs was undertaken in 2003 by Rog Palmer of Airphoto Services, Cambridge. The assessment included visits to CUCAP and the NMR and the aerial photographs were re-plotted at 1:2,500 scale.

The results of this re-plotting are shown in Figures 1 and 2 and the complete report can be found in Appendix 1. The plot shows a particularly dense complex of settlement, particularly SAM 20801, farmsteads, trackways and fieldsystems the majority of which are probably of Roman date.

Further replotting is considered unnecessary for this report

2.5 Earthworks

The low earthworks to the north of Chestnut Farm have been recognised since at least 1954 (PHER 03616).

2.6 Archaeological Excavations and Surveys

Although no excavations are known to have taken place within the subject area, an evaluation in 1994 to the northeast at Throckenholt Farm, Parson Drove revealed extensive Roman remains (Bray & Spoerry 1994). This site is also known from aerial photographs and has a similar character to that at Wryde Croft.

3 Official Designations

The low earthworks to the north of Chestnut Farm (PHER 03616) have been designated as Scheduled Ancient Monument 20801.

4 Archaeological and Historical Background

4.1 Bronze Age

The data presented in Appendix 1 and figs 1 and 2 clearly shows that early prehistoric occupation was limited to areas to the south and west of the subject area. The geology for the area suggests that at this time the site area lay within an extensive lagoon dominated by early river courses.

By the Bronze Age the subject area was dominated by a single roddon (palaeochannel) which would become the focus for later occupation. At this time the roddon was an extensive watercourse fed by numerous other river channels. Again the archaeology is focused towards the drier lands and fen edge to the west where settlement and burial monuments have been recognised. The fenlands with their complex natural waterways provided seasonal opportunities for grazing and wildfowling, and would have been exploited by these early occupants. The archaeological data suggests, however, that the fens themselves were not occupied.

4.2 Iron Age

In the Iron Age the lagoon remained over Chestnut Farm and the Terrington Beds were deposited in it. The lagoon was also fed by roddons draining from the south. Much like earlier times settlement was located in the western parts of the parish. The extensive and complex dendritic river and drainage patterns had now given way to the development of marshes and peat growth.

4.3 Roman

During the Roman period there is a considerable development in settlement both on the gravels to the west and also on the Terrington Beds in the northern parts of the parish. It is at this time that the area around Chestnut Farm became habitable and an extensive system of cropmarks showing settlement, farms, fieldsystems and droveways developed.

4.4 Saxon

By Saxon times peat growth had started again. Only small amounts of dry land were available under the present village and even the lands to the west favoured in prehistoric times were now beneath shallow fen (Hall 1987).

Thorney as a village name is not known until the late 10th century, although a hermitage or anchorite is recorded in the area in the Anglo-Saxon Chronicle of 656.

4.5 Medieval

The site area lies on the south side of the Old Ea or Shire Drain, which in the 13th Century probably divided the Lincolnshire and Cambridgeshire fens. The Lincolnshire fens were shallower and probably as a result provided reliable pasture in summer. This could not be guaranteed on the Thorney side of the drain (Hall 1987). Other parts of the Thorney fen were reclaimed by the 17th century as recorded by Benjamin Hare in 1652.

Gold Dike, which lies on the eastern boundary of the site area is known as such from about 1500 and was known as *Abbotesdik* in 1228. The dyke relates to land to the east owned by the Abbot of Ely. Wryde Croft, which covers much of the site area, occurs as a name from about 1250 and refers to a twisting stream that runs from Thorney along the course of the Bronze Age roddon through this area.

4.6 Site-Specific Background

A site visit was undertaken on the 20th November 2003. Conditions were dry and clear. The area was viewed from Malice Farm, Chestnut Farm and Archers Drove, all of which provided good views. The majority of the subject area is under plough and apart from the earthworks at Chestnut Farm, no archaeological features of any relief were observed. No new site visit was undertaken for this revised report.

4.7 Previous Archaeological Work

There are no known archaeological excavations within the subject area although as demonstrated above the existence of complex archaeological remains has been known for some time and a sample of the site has been selected as a Scheduled Ancient Monument. Hall (1987) outlines the positioning of Roman settlement in this area in prehistoric and Roman times and shows the location of the fen edge.

As part of the Fenland Project the lands between Chestnut Farm and Gold Dike to the east were walked in some detail. The land in the northern half of the area was walked in 30m transects whilst the southern fields were walked in a less systematic although still thorough manner (Hall 1987).

5 Confidence Rating

5.1 Historical Sources

Original documentary research has not been undertaken, as it lies outside the scope of this survey.

As a whole, the available documentary sources provide some useful and reliable information on the later historic, economic and social development of the parish.

5.2 The Historic Environment Record (formerly SMR)

The information provided by the CHER/PHER is affected by the following:

- the distribution of known cropmark remains and stray finds show a bias towards the later prehistoric and Roman periods and their locations may to some degree reflect the pattern of earlier watercourses now preserved as roddons
- the information provided by the CHER partially reflects the amount of archaeological work undertaken within the parish. Much of this work has taken place in the higher-lying parts where more recent development has occurred

The CHER/PHER collection represents a variable source of information that has been influenced by fieldwork strategies, collection of finds, antiquarian observations, local and professional interests. The degree of accuracy of the entries is therefore variable.

5.3 Cartographic Evidence

The earliest surviving map of the parish dates from 1652 and does not show any notable detail about the subject site. A second map dated 1732 is similarly blank.

Bearing in mind the varying degree of accuracy and detailing of the pre-Ordnance Survey maps, as a whole, the available cartographic evidence provides useful information for the later post-medieval and more recent development of the town and surrounding area.

5.4 Aerial Photographs

Aerial photographic assessment is affected by the coverage available and the quality of the cropmarks at the time of being photographed. This in turn is dependent upon weather and soil conditions for many months, even years beforehand. Taking these factors into account, the specialist (Rog Palmer, Air Photo Services) selects only those images that show relevant detail and replots them.

In this instance, the degree of confidence in the results is good.

5.5 Earthworks

The low earthworks to the north of Chestnut Farm have been designated as Scheduled Ancient Monument 20801, hence confidence in this form of evidence is high.

5.6 Archaeological Excavations and Surveys

Only comparative data from the evaluation in 1994 to the northeast at Throckenholt Farm, Parson Drove is available. No intrusive archaeological work has been carried out within the subject area

6 Deposit Mapping of Archaeological Remains

In this section, an attempt has been made to map all known monuments and events and, based on this mapping, to predict the existence of further remains within the proposed development site. These predictions should not be used to produce 'constraint maps'.

6.1 Prehistoric

Due to the environmental conditions at the time, early prehistoric sites tend to be buried under some of the later deposits in this area. The only Bronze Age sites are on small gravel islands to the south and it is unlikely that further finds of these periods will be found in the development area.

6.2 Romano-British

Since the inception of aerial photography, extensive and complex cropmark sites have been identified in the Fens around Thorney and Parson Drove. Stray finds recovered by farmers and locals crossing ploughed fields have shown that these sites are mostly Roman.

Modern interpretation of the cropmarks shows the complexity of the sites and in the particular case of Wryde Croft, one area has been selected as a Scheduled Ancient Monument (SAM 20801). The majority of the archaeological features encountered within the development area are likely to be Roman.

6.3 Anglo-Saxon

Early and middle Saxon occupation tends to be dispersed clusters of settlement and not villages, and this can make predicting the location of such sites problematic.

Although no finds of this period have been made to date in this part of the parish, Saxon occupation cannot be discounted and stray finds may be encountered.

6.4 Medieval

There is no particular evidence of a ridge and furrow agricultural system, however there may be other remnants of the pre-Enclosure landscape such as field boundaries within the study area.

7 Degree of Survival of Archaeological Remains

This section broadly assesses the degree of survival of archaeological remains in the areas defined by deposit mapping. The assessment takes the form of a prediction model based on probability and not certainty. It is intended as a guide only.

A major constraint to a prediction model is presented by the paucity of recovered archaeological evidence from within the study area itself. Although the proposed development lies within several areas of high archaeological potential, little is known directly about the exact character of the features. Interpretations are therefore subject to the aforementioned provisos.

The degree of preservation of potential buried remains within the study area is likely to have been affected by modern deep ploughing and by the drainage of the general area since the 17th century. Taking the evidence found at Throckenholt Farm into consideration, however, the major features are likely to be substantial ditches that survive well. Smaller features related to settlement may also survive in areas that have not been adversely affected by modern ploughing.

8 Rating

Based on the distribution of known finds and their degree of survival in the study area, as defined in the previous sections, rating can be summarised as follows:

Distribution
Low/known
High/known
Low/known
Low/known

Survival unknown good poor good

9 Conclusions

The revised proposal is for seven wind turbines, with the immediate impact confined to seven areas of approximately 8-12m² for the turbine foundations (buried to plough depth) and approximately 216m² for the associated crane pad areas, the substation will require approximately 2,700m² of land. A temporary construction compound is needed with additional works to include new tracks, upgrading of existing farm tracks, underground cable trenches and watercourse crossings.

The assessment suggests an area of complex Romano-British settlement and farming systems. The aerial photographic survey provides a broad outline of the types of archaeology involved and their degree of complexity, both of which are high. It does not however provide the level of detail to indicate whether adjusting the positions of the turbines into the apparently archaeologically blank areas will mean that there is no archaeological impact.

This assessment is complicated by the fact that cropmarks will only indicate the position of the major ditched systems. Smaller settlement features may not be clearly identified on aerial photographs and they are commonly only interpreted as such due to complex ditch systems defining enclosures. Therefore the blank spaces in the cropmarks may be as significant as the ditch systems recorded on the photographs.

Furthermore it is unclear as to the significance of the northwest to southeast droveway that cuts through the subject area. The intermittent picture to the northeast of it and the absence of cropmarks to the southwest may suggest a topographical or geological phenomenon that is disguising the complete record and causing a bias in interpretation.

Figure 2 outlines the most archaeologically sensitive areas based on sites protected by national legislation and areas defined as containing archaeological deposits following the archaeological baseline assessment.

It is clear from the aerial photographic evidence and the proposed locations of the wind turbines and access tracks within the site that the archaeology will be impacted on where penetration passes through the topsoil and subsoil into the underlying substrata. It is however unclear as to the actual impact as the relevant aerial photographs and plots lack detail to map the archaeology at a fine enough resolution to define categorically the archaeology within a 10 metre square. A further complication is that there will inevitably be a degree of error in the location in the archaeological features resulting from the plotting of oblique photographs.

Figure 1 shows that Turbines 1, 2, and 3 should have less impact on the archaeology, whilst Turbines 4, 5, 6, and 7 are likely to have more

impact. It is however unclear without further investigation what this impact will be since the cropmarks are likely to exhibit several phases of re-statement and re-organisation. As a result it is difficult at this stage to judge whether the impact points will be in settlement areas as opposed to field systems. Allowing a 50m buffer around each turbine for re-siting would enable a degree of flexibility to the layout.

It is apparent that wherever the turbines, cable trenches, and tracks are positioned there is likely to be some impact on the archaeology and it is presently unclear precisely what types of remains will be impacted on. However, with piling being used for the turbine foundations and narrow cable trenches the physical impact is likely to be on a relatively small scale. It is therefore clear that should the wind farm development proceed, further archaeological fieldwork will be a necessity.

9.1 Palaeolithic and Mesolithic

Further stray finds from these periods cannot be discounted, although they are unlikely to be found *in situ*.

9.2 Neolithic and Bronze Age

The only Bronze Age sites in the area lie to the south on gravel islands and there is little chance that further ritual sites of these periods may be encountered in the subject area.

9.3 Iron Age and Roman

Although Iron Age remains have not previously been found close to the proposed development, there are undated cropmark sites that extend into the subject area and which may prove to date to this period.

The quantity and variety of Roman remains from around the study area make it likely that further finds from the period will be located during groundworks.

9.4 Saxon and medieval

The Saxon period is not well represented in the record for this part of Thorney parish and the situation is similar for the medieval period, but sites have been found.

9.5 Post-medieval and modern

Stray finds of these periods may be encountered at any point along the proposed route. Elements of relict field systems might be expected in many parts of the subject area.

9.6 Summary

The objective of this study was to assess the archaeological potential of an area around the proposed site of a wind farm at Wryde Croft, Thorney, Peterborough.

The study has demonstrated that the subject site lies within a rich archaeological landscape, surrounded by sites of chiefly Roman date. Largely Roman remains or finds are known from the vicinity of the proposed development itself, and its overall archaeological potential may be considered high, with particular emphasis placed upon the Roman period.

If archaeology is encountered in the subject area, conditions for preservation are likely to range from moderate to very good, particularly at depth where waterlogging may have preserved organic remains.

9.7 Suggestions for further work

9.7.1 Known archaeological sites

The known archaeology and aerial photographic plots signify an area rich in Roman archaeology and any work is likely to impact on the archaeological resource. Within the present scheme there are clear mitigation options to minimise the impact on the known resource and this has been built into the scheme by requesting a 50m buffer zone for siting each turbine.

9.7.2 Unrecorded below ground archaeological sites

Unfortunately, due to the nature of the evidence, the residual effect is unclear. The movement of the turbines within the demarcated areas to avoid the features indicated on the cropmark plots will undoubtedly impact on other types of archaeology which are not represented in the existing archaeological record presented above

As a result it is clear that any work within Wryde Croft, Chestnut, Gold Dike and Malice Farms will impact on important Roman archaeology and will require additional archaeological strategies to record any disturbed remains. Non-intrusive strategies that may be appropriate include fieldwalking of the proposed areas and geophysical survey. Both sets of results could be supplemented by test-pitting or trial trenching to confirm or disprove the presence of archaeology surviving at these points.

As the archaeological remains are either low earthwork, as in the case of Scheduled Ancient Monument 20801, or cropmarks in ploughed farmland, as shown on aerial photographs, then the turbines should have little visual impact on the surviving remains.

A programme of linear trenching would be helpful to focus on areas that have demonstrated archaeological potential. Within these defined areas, a 5% sample is considered normal to form a reasonable hypothesis as to the nature of the site.

Ultimately, the relevant local authority advising on planning conditions, i.e. Peterborough City Archaeology Service, will determine all recommendations for further work.

Acknowledgements

The authors would like to thank RES UK Ltd who commissioned and funded the assessment. The project was managed by Toby Gane and the illustrations are by Séverine Bézie.

Bibliography

Bray, S. and Spoerry, S.	1994	<i>Throckenholt Farm, Parson Drove: A Roman Landscape on the Silt Fen,</i> CCC AFU Report No 109 <i>Cambridgeshire Historic Environment Record</i>
Hall, D.	1987	<i>The Fenland Project No.2. Cambridgeshire</i> <i>Survey, Peterborough to March</i> . East Anglian Archaeology 35.
		Peterborough Historic Environment Record
Waller, M	1994	Flandrian Environmental Change in the Fenland. East Anglian Archaeology 70
Maps Consi	ulted	
John Halsey, 17	731-32	A Map of the Manor or Lordship of Thorney CRO R71/81
Benjamin Hare	1652	The True Plott and Linear Description of the Mannor of Thorney Abbey, CRO R71/81

Appendix 1: Summary of HER Entries

HER No.	Grid Ref.	Period	Description
03616 SAM 20801	TF/314/084	Ro	Roman settlement with enclosures, field systems and watercourses. Roman pottery found as part of the Fenland Survey.
03788	TF/341-/040-	Ro	Extensive Roman settlements exists to the N and NW of Thorney Toll Roman sherds found here in 1930.
04992	TF/3105/0505	BA	Barrow ? Some flints recovered. Fenland Survey RN 749, THO U1
05385	TF/3088/0836	Ro	Roman settlement found during the Fenland Survey.
05386	TF/3143/0918	Ro	Romano-British field system. Drove with enclosures adjacent.
05387	TF/3192/0951	Ro	Small site. Fenland Survey RN 706, THO S16.R1, Ro settlement. Not many sherds
05483	TF/3206/0518	? BA	Possible barrow.
06058	TL/3161/0825	Ro	Earthworks of Roman settlement. Part of THO S9.Possibly a settlement but most likely more of the paddocks. Includes the droveway.
07898	TF/3390/0650	Ro	A double ditched drove which runs from the Old South Eau for 3.5km. Believed to demarcate the SW limit of the extensive Roman settlement of the seaward silts and clays as marks the line beyond the which freshwater flooding was expected.
08265	TF/32/06	Med	A monastic grange existed at Wryde in the C14. The place-name element 'Wryde' occurs over a wide area and is derived from the Old English 'Wride', meaning a winding stream.
08420	TF/3441/0191		Knar Cross, marked on map of 1749.
09394	TF/340/077	Ro	Boundaries, suggested to be the Grange (see 08265) by CW Phillips.
09395	TF/348/082	U	Group of rectilinear enclosures possibly related to stock
09396	TF/332-/084-	Ro U	management following the line of the roddon. Regular system of large fields with probably farms in multi-
09390	17/332-/004-	ROU	ditched enclosures. This settlement has the appearance of a
09397	TF/337/084	Ro	pair of important farms rather than more usual "village". Roman fields and lanes
09398	TF/336-/081-	Ro	Romano-British fields, lanes etc See RN 09397 and 09410 for
	TE/000 /070		adjacent cropmarks. RN 09418 for other references.
<u>09399</u> 09400	TF/330-/073- TF/333-/075-	Ro Ro	Romano-British field complex Probable Romano-British settlement group. Extensive group of small ditched enclosures, mainly along watercourse with associated network of ditched fields, as soil-colour & cropmarks. Large rectangular enclosure with wide double or multiple ditches and external annexes. Interior appears as a ditch-free zone. Smaller enclosure at TF/3290/0831 is possibly of earlier date
09401	TF/336/075	Ro	Roman field system
09402	TF/3355/0673	Ro	The course of a Roman ditched drove running fromTF/2838/0995 to TF/3355/0673 seen on APs as a parallel cropmark. It is associated with three probable RB settlements (TF 30 NW 1, 4and 6) and forms the SW boundary of two of these.
09403	TF/339/074	Ro	Field complex
09404	TF/327-/080-	Ro	Small enclosures (off Malice Farm) part of extensive field network.
09405	TF/314-/098-	Ro	Small group of enclosures
09406	TF/321-/097-	Ro	Romano-British field complex. Romano-British Agriculture continues into adjacent fields as soil and cropmarks. Outside Cambridgeshire and continuing into Lincolnshire.
09407	TF/321-/090-	Ro	Romano-British field complex.
09410	TF3384/0789	Ro	Romano-British settlement.
09411	TF335/093	Ro	Possible settlement
09412	TF09412	Ro	Enclosures
09413	TF/341/073	IA Ro	Enclosures
09414	TF/3426/0736	Ro	Group of small ditched enclosures
09415	TF/3462/0757	Ro	Enclosures, possibly part of settlement
09416	TF/340/083	Ro	Fields and lanes
09417	TF/341/091	Ro	Small fields with possible settlement
09418	Tf/3305/0805	Ro	Extensive Roman settlement. A system of fields, lanes and farms.
09419	TF/3347/0686	Ro	Small rectangular ditched enclosure aligned on straight drove marking fenward limit of Romano-British settlement area. Site not visited by correspondent.

09423	TF/340-/034-	U	Horseshoe shaped feature. Penannular feature showing traces of a double ditch along part of its arc. Too large for a barrow
09424	TF/332-/028-	U	Cropmark, Sketch on 1:10560 map in Office.
10557	TF/336/076	U	Linear feature, possibly fieldsystem
10578	TF/342/071	U	Possible droveway on a roddon
10579	TF/343/075	U	Ditches
10580	TF/348/077	U	Ditches
10581	TF/342/089	U	Rectangular enclosure ?
10582	TF/347/087	U	Rectangular enclosure ?
10927	TF/3376/0828	Ro	Settlement with greyware pottery.
11035	TF/305/093	U	Enclosure with fields
11041	TF/325-/089-	U	Double ditched track making angular turn / junction and appearing
			to run from the NE towards the complex system at Chestnut Farm (RN 06058)
11042	TF/310-/100-	U	Ditches of field system (see also RN 05386) plus trapezoid enclosure with wide spaced double ditches and intermediate bank.
11043	TF/334-/069-	U	Traces of fields and enclosures. Links to E (Parson Drove) and N (RN 09400).
11044	TF/331-/078-	U	Enclosures and droves. Links to E (Parson Drove) and with the traces to the S (RN 09400).
11045	TF/333-/078-	U	Track, continuation from Parson Drove system. Part of larger field complex described in RN 09400.
11046	TF/332-/083-	U	Tracks and fields. Part of the larger system (described in RN 09400) and that to E in Parson Drove
50262	TF/3161/0825	Ro	Trackway. Double-ditched Droveway, "The limiting Drove". See also settlement RN 50246
50263	TF3070/0983	U	Enclosures and ditches
50264	TF/3290/0990	Ro	Group of small enclosures
50637	TF/3047/0868	Mod	Aircraft crash site. Excavated in 1976.

Key to periods:

IAIron AgeMedMedievalModModernPrePrehistoricP MedPost-medievalRoRomanUUndated

Appendix 2 Environmental Impact Statement

1 Defining The Significance Of Environmental Effects

To maintain consistency within Environmental Statements produced by RES, a standard set of criteria has been defined for use by all consultants working for RES and for use by RES staff. The intention of the system is to enable a common order of 'magnitude', 'sensitivity' and hence 'significance' to be applied to the effects of a proposal, whether they relate to landscape, ecology or highways. The term "significance" is used in the context of impacts as identified in Schedule 3 of The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999. The following describes the methodology used to determine significance. This should be read in conjunction with the main text of the ES as it is a guide and is not exhaustive.

2 Methodology

Each assessment should determine the effect of the proposal on the environment. It should then determine whether an effect is significant. As stated in the regulations, if an effect is not significant, it should not be considered as material to the decision making process.

The first aspect that is assessed is sensitivity. The effect of the proposal on the baseline environment can only be determined once the sensitivity of the baseline has been established. Sensitivity is categorised as Low, Medium or High.

For example, in terms of ornithological assessment, sensitivity could be defined as the ecological importance of the species being assessed. e.g. species present in nationally important numbers would be classed as high sensitivity. In terms of landscape a high sensitivity receptor could be a designated landscape such as a National Park with a low capacity to accommodate proposed forms of change.

The magnitude of the effect on the baseline can then be assessed. Consideration of the scale, extent of change, nature and duration of effect are important in determining magnitude. Definitions of magnitude are given within Guidelines for Landscape and visual Impact Assessment (2002). Table A2.1 below provides the definitions of magnitude used for the purposes of this assessment.

Level of Magnitude	Definition of Magnitude
High	Total loss or major alteration to key elements/features/characteristics of the baseline (pre-development) conditions such that post development character/composition/attributes of baseline will be fundamentally changed.
Medium	Partial loss or alteration to one or more key elements/features/characteristics of the baseline (pre-development) conditions such that post development character/ composition/ attributes of baseline will be partially changed
Low	Minor loss of or alteration Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of the baseline condition will be similar to pre development circumstances/patterns
Negligible	Very minor loss or alteration to one or more key elements/features/characteristics of the baseline (pre-development) conditions. Change barely distinguishable, approximating to the "no change" situation.

Table A2.1 Definitions of Magnitude

Using these definitions, a combined assessment of sensitivity and magnitude can then be undertaken to determine how significant an effect is.

The following table shows how impact significance is related to sensitivity and magnitude of change.

	SENSITIVITY		
	Low	Medium	High
MAGNITUDE			
High	Moderate	Substantial	Substantial
Medium	Slight	Moderate	Substantial
Low	Slight	Slight	Moderate
Negligible	No Change	No Change	No Change

Table A2.2 Significance

3 Summary

Based on the above methodology the effects of the proposed wind farm can be determined. Table A2.3 below summarises the various effects predicted for the Wryde Croft wind farm.

It must be emphasised that Table A2.3 is for quick reference only and should be read in conjunction with the main text of the relevant sections of the EIS.

Topic Area	Description of Possible Effect	Sensitivity of Baseline Environment	Magnitude	Magnitude Significance	Mitigation Measures(s)	Significance after Mitigation/Residual Impact
Archaeology	Cropmarks Roman settlements and farmsteads	High	Low	Moderate	By the use of geophysical survey to continue investigation of high impact areas such as the compounds and turbines it may be possible to verify the absence of complex archaeology and relocate activities to areas where the impact on the archaeology can be minimised.	Moderate. Limited or no impact providing there is suitable scope for relocation.
	Cropmarks Roman Trackways	Medium	Low	Slight	As above	Slight. As above.
	Cropmarks Roman Field systems	Low	Negligible	No Change	As above	No Change.

Table A2.3 Summary of Effects (cont). (for quick reference only, please read in conjunction with relevant sections of the full EIS)

17

Appendix 3: Aerial Photographic Assessment

by Rog Palmer MA MIFA

1 Summary

This assessment of aerial photographs examined an area of some 250 hectares (centred TF330078) in order to identify and accurately map archaeological and natural features.

For this Assessment, photo interpretation and mapping concentrated on providing a general picture of features in the area rather than fine detail. In part, this was due to the density of features, in part to the small scale of the available photographs.

Local soils affected past settlement and the Assessment Area has an archaeologically rich area in its northeastern (and larger) part and land that was too wet for settlement in the southwest.

These soils were separated in Roman times by a ditch-defined straight road, the 'limiting drove'. East of this is a network of ditched features whose regularity and straightness suggest they were surveyed. These ditches define fields among which are clusters of smaller enclosures that are likely to identify settlement foci.

The Area is covered by a mesh of roddons – former watercourses – whose presence appears to have had no affect on the design and layout of the ditched features.

Many former field boundaries, mapped on OS 1:10560 sheet TF30NW, have been removed in recent years.

Original photo interpretation and mapping was at 1:2500 level.

2 Introduction

This assessment of aerial photographs was commissioned to examine an area of some 250 hectares (centred TF330078) in order to identify and accurately map archaeological and natural features and thus provide a guide for field evaluation. The level of interpretation and mapping was to be at 1:2500.

3 Archaeological And Natural Features From Aerial Photographs

In suitable cultivated soils, sub-surface features – including archaeological ditches, banks, pits, walls or foundations – may be recorded from the air in different ways in different seasons. In spring

and summer these may show through their effect on crops growing above them. Such indications tend to be at their most visible in cereal crops, between May and July in this part of Britain, although their appearance cannot accurately be predicted and their absence cannot be taken to imply evidence of archaeological absence. In winter months, when the soil is bare or crop cover is thin (when viewed from above), features in the Fenland may show by virtue of their different soils. Upstanding remains, which may survive in unploughed grassland, are also best recorded in winter months when vegetation is sparse and the low angle of the sun helps pick out slight differences of height and slope.

Such effects are not confined only to archaeological features. Natural deposits can cause similar differences in crops and appear as vivid colour changes in bare winter soils and the systems of Fenland roddons (former watercourses) are often seen at their clearest on winter photographs. The edges and extents of such features tend to vary from year to year with the amount of ground moisture content. Mapping of former watercourses for this assessment indicates their approximate extents.

Vertical photographs cover the whole of Britain and can provide scenes on a series of dates between (usually) 1946-7 and the present. Vertical surveys of the Fenland have been more informative and comprehensive than the scatter of lower altitude obliques and have been especially valuable for this Assessment despite their small scale. Vertical photographs are taken by a camera fixed inside an aircraft and adjusted to take a series of overlapping views that can be examined stereoscopically. They are often of relatively small scale and their interpretation requires higher perceptive powers and a more cautious approach than that necessary for examination of obliques. Use of these small-scale images can also lead to errors of location and size when they are rectified or re-scaled to match a larger map scale.

The most immediately informative aerial photographs of archaeological subjects tend to be those resulting from specialist reconnaissance. This activity is usually undertaken by an experienced archaeological observer who will fly at seasons and times of day when optimum results are expected. Oblique photographs, taken using a hand-held camera, are the usual product of such investigation. Although oblique photographs are able to provide a very detailed view, they are biased in providing a record that is mainly of features noticed by the observer, understood, and thought to be of archaeological relevance. To be able to map accurately from these photographs it is necessary that they have been taken from a sufficient height to include surrounding control information.

4 Photo Interpretation And Mapping

4.1 Photographs examined

Cover searches were obtained from the Cambridge University Collection of Aerial Photographs and the National Monuments Record: Air Photographs (NMRAP), Swindon. Photographs included those resulting from specialist archaeological reconnaissance and routine vertical surveys.

Photographs consulted are listed in the Appendix to this report.

4.2 Base maps

Digital data from original survey at 1:2500 were provided by the client. To use this with the older vertical photographs it was necessary to transform the 1:10560 map (quarter-sheet TF30NW) to match the modern base. The combined map showed current and recently removed field boundaries and this was used as the base for all transformations.

4.3 Study area

Photographs were examined in detail for an area extending 100m beyond the assessment area. More extensive context is available on Map 10 from the first Fenland Survey (Phillips 1970) although there is some confusion of roddons and archaeological information.

4.4 Photo interpretation and mapping

All photographs were examined by eye and under slight (2x) magnification, viewing them as stereoscopic pairs when possible. Interpretations of obliques, made at 1:2500 level, were marked on overlays to individual prints following procedures described by Palmer and Cox (1993). These overlays were then scanned and transformed to match the combined base map using Irwin Scollar's AirPhoto program (Scollar 2002). Transformed files were set as background layers in AutoCAD Map, where features were overdrawn using standard conventions.

Because the RAF verticals at NMRAP were so informative, laser copies were purchased, scanned and then transformed to match the base map. Interpretation of these was done on screen while making reference as required to stereoscopic prints.

Layers from the final drawing have been used to prepare the figures in this report and have been provided to the client in digital form.

4.5 Accuracy

AirPhoto computes values for mismatches of control points on the photograph and map. The 1:10560 map was matched to the 1:2500 digital data with mean matches of control points of less than ± 2.0 m. However, the accuracy of the 1:10560 survey is likely to be in the region of ± 5.0 m. Despite this, all transformations prepared for this assessment returned mean mismatches of less than ± 1.50 m – values smaller than the survey accuracy of the combined base map. It is not known how accurate positions will be when transferred from the mapping to ground measurements.

5 Commentary

5.1 Soils

The Soil Survey of England and Wales (SSEW 1983) shows the soils of the Area as being a determinant factor in the recorded archaeological remains. The significant dividing line is marked by the ditched road that runs south-east from Chestnut Farm. All soils are marine alluvium but were deposited at different times. Those east of the road are soil associations 813g: Wallasea 2 and 813h: Dowels (which overlies peat), those to the west are soil association 815: Normoor. This differs from Hall's account of Flandrian deposits (1987, 4-10; 48) which shows the whole Assessment Area to be primarily of silty clay, a marine deposit named the Upper (or younger) Barroway Drove Beds, a name more recently simplified to 'silty clay' (Hall and Coles 1994, 16). A later deposit on this was the silt-filled (Terrington Beds) roddon that he suggests to be of iron age date (Hall 1987, 8). The east side of the roddon marks the eastern edge of the more extensive deposit mapped by the Soil Survey.

Examination of aerial photographs did little to resolve the difference as most were of too large a scale to get the necessary overview. SPOT satellite data (http://geoengine.nima.mil/) showed the eastern edge of the later silt but not the western extent. Of relevance to this Assessment is the question of whether the later deposit on the west of the road was unsuitable for settlement or has completely masked it.

5.2 Archaeological features

Photo interpretation and mapping for this Assessment has been concerned more with showing the overall pattern of past features than producing a detailed map that shows fine detail. The latter would be a lengthy task that requires purchase of good-quality prints of the most informative photographs. The Assessment Area is well recorded on RAF verticals taken in 1946 but is only partially documented by lower-altitude archaeologist-targeted obliques.

The soils of the area are of kinds that were settled in Roman times in other nearby parts of the Fenland. The work of the Fenland Survey (Hall 1987) has shown that these were dry land in the Roman period. It is probable that all the evidence in the Assessment Area interpreted from air photographs dates from these times.

The Assessment area is bisected by the Roman road that runs from Chestnut Farm (and presumably beyond it to Crowland) south-east towards Grandford on the western edge of March island. The road also divides the recorded archaeological information and the ground shows virtually nothing on its west side while from the east springs a series of parallel ditched boundaries that mark out a block of surveyed land allotment. This road was seen as a significant factor in the local settlement by the first Fenland Survey in which it was named the 'limiting drove' that marked the divide between settled land to the north-east and that on which winter flooding could be expected (Phillips 1970, 295). This was confirmed in discussion with David Hall based on more recent knowledge of the Fens who pointed out that the silts west of the road were always too wet for settlement (emails: 2-3 December 2003).

The recent Fenland Survey had no formal input from aerial photographs and so Hall's map (1987, figure 33) is devoid of much of the information published in the first Fenland Survey (Phillips 1970, map 10). The earlier map gives a more realistic picture of past features in an area that Hall shows as peat. This gives a reminder that Hall's period maps show an instant in the 400-year Roman period which work here and elsewhere [personal research in Grandford environs] shows were times of rapid environmental change.

Much of the Roman settlement in the Fenland utilised the higher ground created by the silt-filled roddons although some features extend into the adjacent peats. Ditch-defined roddon-based settlement is usually sinuous as it follows the former water courses, but in the Assessment Area many features are laid out in clear disregard to any topographical constraints and it seems likely that the marine alluvium provided an almost level surface for the land surveyors. Many of the ditches clearly have been pre-surveyed and in that respect are similar to the field system at Christchurch (Hall 1996, fig 96: TL4997) and, to a lesser extent, that north of March (ibid, fig 102: TL4399). Those at Thorney have been cut across minor roddons with no change in their alignment and appear to be part of an extensive system of land division that extends north of the present Area (Phillips 1970, map 10; working 1:10560 maps held by the writer). Clusters of smaller enclosures are scattered throughout the more regular land allotment ditches and are likely to indicate settlement foci with dwellings and paddocks.

Addendum: Aerial photographs examined

Source: Cambridge University Collection of Aerial Photographs (computer cover search, 7 November 2003)

Oblique photographs

TF314085 BOU 67-70 BVT 108	ALB 79-81	4 June 1965 20 September 1973 12 August 1975
TF330073 CQK 83-85	CPC 47-51	28 July 1981 26 July 1984
TF330083 CQL 6-7	CQL 1-2	26 July 1984 26 July 1984

Vertical photographs

RC8-AT 253	17 May 1975	1:13650
RC8-EF 91-94	25 March 1982	1:10000
RC8-EF 130-133	25 March 1982	1:10000
RC8-EF 193-195	25 March 1982	1:10000
RC8kn-BD 76	23 May 1988	1:10000
RC8kn-BD 110, 112	23 May 1988	1:10000
RC8kn-BD 186	23 May 1988	1:10000

Source: National Monuments Record: Air Photographs (cover search 63436)

Specialist collection

Vertical collection

106G/UK/1489: 4440-4443	9 May 1946	1:9800
106G/UK/1606: 2416-2420	27 June 1946	1:9800
106G/UK/1606: 6419-6421	27 June 1946	1:9800

6 September 1946 106G/UK/1717: 4196-4197 1:9800 106G/UK/1717: 4232-4234 6 September 1946 1:9800 541/205: 3086-3088 20 November 1948 1:10000 541/205: 3104-3107 20 November 1948 1:10000 20 November 1948 541/205: 4086-4089 1:10000 7 June 1975 OS/75187: 47-49 1:7500 7 June 1975 1:7500 OS/75187: 104-108 7 June 1975 OS/75187: 118-121 1:7500 29 April 1976 MAL/76022: 154, 156 1:10000 MAL/76042: 141 11 June 1976 1:10000 MAL/76042: 149-150 11 June 1976 1:10000

Most informative photographs

106G/UK/1489: 4441-4443 106G/UK/1606: 6420 541/205: 3087-3088 541/205: 3106 OS/75187: 105 TF3108/14 TF3108/20 TF3307/9 TF3307/20 Air Photo Services have produced this assessment for their clients, Cambridgeshire Archaeological Field Unit, subject to the following conditions:

- Air Photo Services will be answerable only for those transcriptions, plans, documentary records and written reports that it submits to the clients, and not for the accuracy of any edited or re-drawn versions of that material that may subsequently be produced by the clients or any other of their agents.
- That transcriptions, documentation, and textual reports presented within this assessment report shall be explicitly identified as the work of Air Photo Services.
- Air Photo Services has consulted only those aerial photographs specified. It cannot guarantee that further aerial photographs of archaeological significance do not exist in collections that were not examined.
- Due to the nature of aerial photographic evidence, Air Photo Services cannot guarantee that there may not be further archaeological features found during ground survey which are not visible on aerial photographs or that apparently 'blank' areas will not contain masked archaeological evidence.
- We suggest that if a period of 6 months or more elapses between compilation of this report and field evaluation new searches are made in appropriate photo libraries. Examination of any newly acquired photographs is recommended.
- That the original working documents (being interpretation overlays, control information, and digital data files) will remain the property of Air Photo Services and be securely retained by it for a period of three years from the completion date of this assessment after which only the digital files may be retained.
- It is requested that a copy of this report be lodged with the relevant Historic Environment Record within six months of the completion of the archaeological evaluation.
- Copyright of this report and the illustrations within and relevant to it is held by Air Photo Services © 2003 who reserve the right to use or publish any material resulting from this assessment.

5.3 Non-archaeological features

The larger roddons have been mapped together with the final channels where the latter showed as peat-filled linear features. East of the road is a mesh of minor roddons that, as they appeared to have no relationship to archaeological features, have not been mapped.

Many field boundaries have been removed in recent years. These are mapped on the OS 1:10560 sheet (TF30NW) and have not been reproduced here.

One possible local pipeline (?or recent field boundary) has been mapped just outside the Assessment Area north of Chestnut Farm.

Land use

With one exception, all fields within the Assessment Area have been in arable use on all dates of photography. The exception is a field immediately north of Malice Farm (TF324086) which appeared to be pasture with earthwork remains in 1946. More recent verticals show it to have been converted to arable use.

This widespread arable use, plus the acquisition of vertical photographs at times of year when crops and soils are responsive suggests that the mapping undertaken for this Assessment will provide a good representation of the major archaeological features.

REFERENCES

Hall, D. N., 1987. The Fenland Project Number 2: Fenland Landscapes and Settlement between Peterborough and March, E. Anglian Archaeol. **35**.

Hall, D. N., 1996. The Fenland Project, Number 10: Cambridgeshire Survey, Isle of Ely and Wisbech. East Anglian Archaeol.**79**.

Hall, D. and Coles, J., 1994. Fenland Survey: an essay in landscape and persistence. London.

OS, 2003. <u>http://www.ordnancesurvey.gov.uk/productpages/landline/positional-background.htm</u>

Palmer, R. and Cox, C., 1993. Uses of aerial photography in archaeological evaluations. IFA Technical Paper **12**.

Phillips, C. W. 1970. The Fenland in Roman Times, Royal Geog. Soc. Res. Ser. 5.

Scollar, I., 2002. Making things look vertical, in Bewley, R.H. and Rączkowski, W., (ed). Aerial archaeology: developing future practice. NATO Science Series, Vol **337**, 166-172.

SSEW, 1983. Soils of England and Wales: sheet 4: Eastern England (1:250,000). Soil Survey of England and Wales, Harpenden.

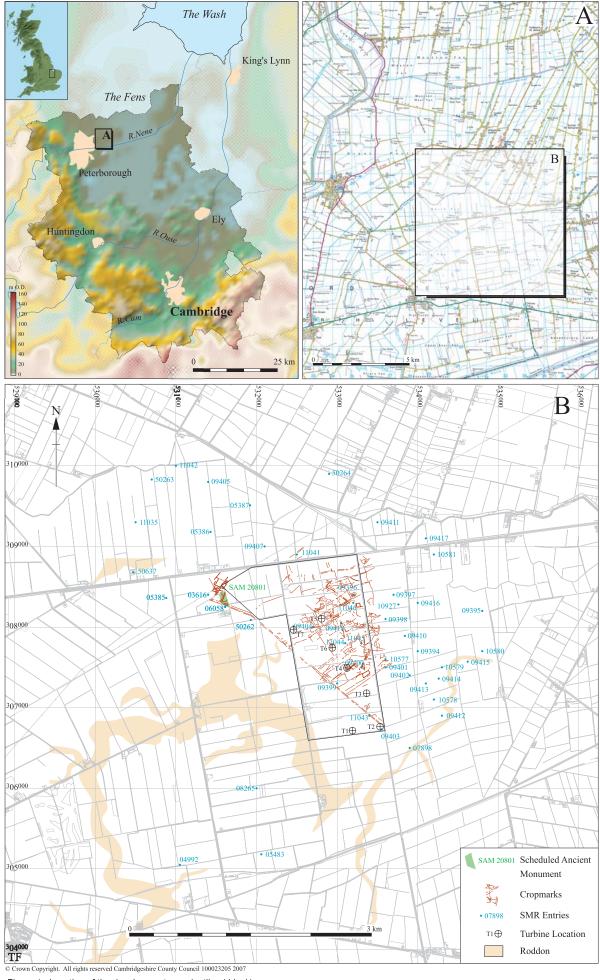


Figure 1: Location of the development area (outlined black)

27

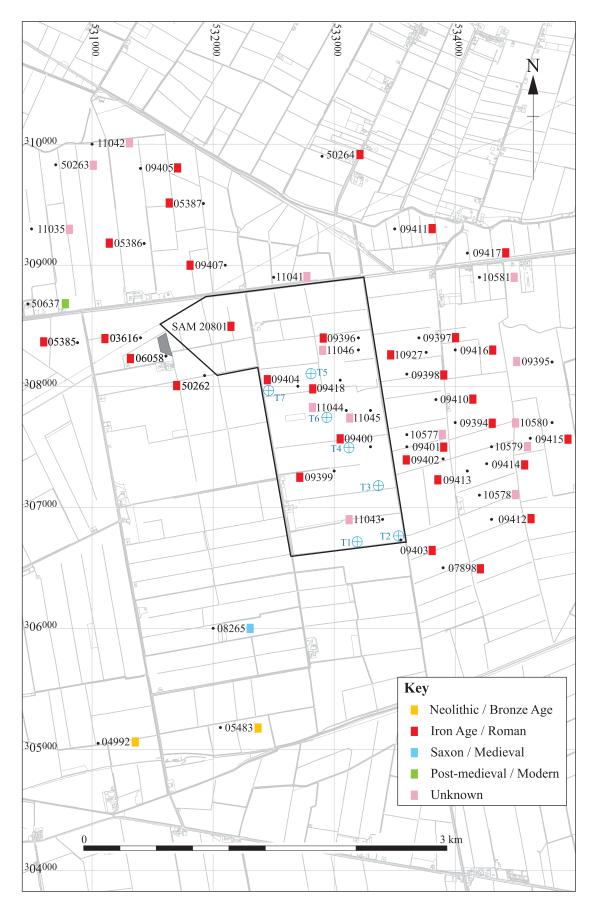
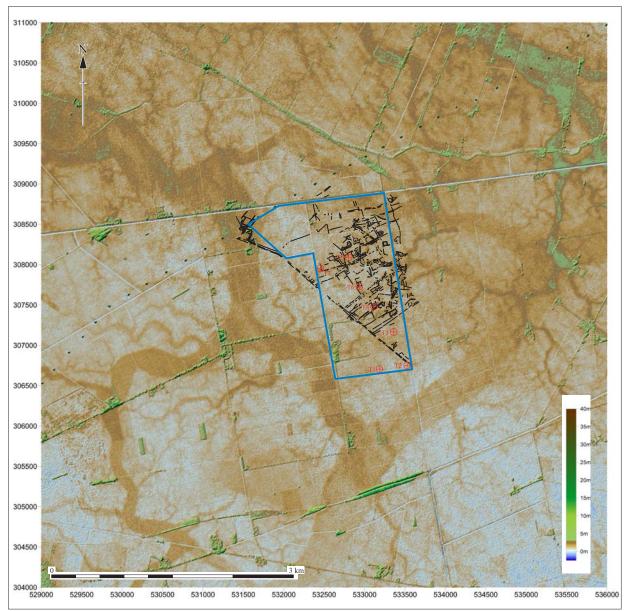
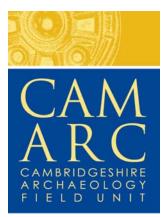


Figure 2: HER entries around the study area



© Crown Copyright. All rights reserved Cambridgeshire County Council 100023205 2007

Figure 3: Cropmarks, turbines and development area overlain on 3 Dimensional surface model



CAM ARC, Cambridgeshire County Council, 15 Trafalgar Way, Bar Hill, Cambridgeshire, CB3 8SQ

General Enquiries: 01954-204191 Fax: 01954-273376

http://www.cambridgeshire.gov.uk/archaeology