LAND AT ST CLEARS ROUNDABOUT, CARMARTHENSHIRE: GEOPHYSICAL SURVEY

The proposed development site at land at St Clears roundabout, Carms.

DAT Archaeological Services

Prepared by Dyfed Archaeological Trust
For: Draycott Group

REGISTERED ORGANISATION CIfA

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REPORT NO. 2020-25
EVENT RECORD NO. 121859

May 2020

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Client	Draycott Group
Event Record No	121859
Report No	2020-25
Project Code	FS20-002
Report Prepared By	Charles Enright
Fieldwork Directed By	Charles Enright
Illustrated By	Charles Enright
Report Approved By	Fran Murphy 21/05/2020

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EXECUTIVE SUMMARY

DAT Archaeological Services were commissioned to undertake a geophysical survey on land at St Clears roundabout, Carmarthenshire.

The purpose of the survey was to provide a better indication of the archaeological potential of the site and, if required, enable targeting of any further archaeological mitigation before or during the development.

The general quality of the geophysical survey results was good, but no anomalies indicative of significant buried archaeological remains were identified.

CRYNODEB GWEITHREDOL

Comisiynwyd Gwasanaethau Archeolegol YAD i gynnal arolwg geoffisegol ar dir ar gylchfan Sanclêr, Sir Gaerfyrddin.

Pwrpas yr arolwg oedd rhoi gwell arwydd o botensial archeolegol y safle ac, os oes angen, galluogi targedu unrhyw liniaru archeolegol pellach cyn neu yn ystod y datblygiad.

Roedd ansawdd cyffredinol canlyniadau'r arolwg geoffisegol yn dda, ond ni nodwyd unrhyw anghysondebau sy'n arwydd o weddillion archeolegol claddedig sylweddol.

LAND AT ST CLEARS ROUNDABOUT, CARMARTHENSHIRE: GEOPHYSICAL SURVEY

SUMMARY

DAT Archaeological Services were commissioned by Draycott Group to undertake a geophysical survey in an area proposed for commercial development. The site is located on land at St Clears roundabout, Old Tenby Road, St Clears, Carmarthenshire (centred on NGR SN 27383 16129).

A condition regarding archaeology (Condition 17) was placed on the planning permission (Planning Application No: W/37120) and following discussions with the archaeological advisors to the planning authority it was decided that in the first instance mitigation would comprise a geophysical survey. This would provide a better indication of the archaeological potential of the development area and allow for an informed decision on any further mitigation required.

An area measuring 1.1ha was surveyed using a Bartington Fluxgate Gradiometer which detects subtle variations in the earth's magnetic field. Readings were taken at a medium resolution on traverses 1.0m wide and every 0.25m within a 30m x 30m grid.

Generally, the survey data was of good quality, with little interference from external influences. However, no features of clear archaeological origin were observed within the survey results.

The results of this geophysical survey would suggest that the proposed development is unlikely to impact upon any known buried archaeological deposits or features.

1. INTRODUCTION

1.1 Project Commission

1.1.1 DAT Archaeological Services were commissioned by Matthew Cocks of Draycott Group to undertake a geophysical survey within an area proposed for commercial development including a McDonald's drive-thru, a Costa drive-thru and a family restaurant/pub. The proposed site is centred on NGR SN 27383 16129 (Figure 1).

1.1.2 Following an appeal (Ref: APP/M6825/A/19/3240281) full planning permission was granted for the proposed development (Planning Application No: W/37120). A condition regarding archaeology was attached to the planning permission (Condition 17) which stated:

No development shall take place until a qualified and competent archaeologist has submitted a written scheme of investigation (WSI) for approval in writing by the local planning authority. This WSI will describe the different stages of the work and demonstrate that it has been fully resourced and given adequate time. On behalf of the local planning authority, their archaeological advisors (DAT DM) will monitor all aspects of this work through to the final discharging of the condition. This work will not be deemed complete until all aspects of the WSI have been addressed and the final report submitted and approved.

1.1.3 Following discussions with the archaeological advisor to the planning authority, Dyfed Archaeologcial Trust-Development Management (DAT_DM), it was decided that in the first instance the mitigation would comprise a geophysical survey within the development area.

1.1.4 The geophysical survey was undertaken using a fluxgate gradiometer which detects subtle variations in the earth's magnetic field, which can indicate the presence of buried features such as ditches, pits, walls or postholes, which are not visible on the ground surface. The purpose of the geophysical survey was to provide a better indication of the archaeological potential of the site through the identification of subsurface features which could be indicative of archaeology. This would allow for an informed decision onwhether any further archaeological mitigation was required or not before or during the development programme.

1.2. Scope of the Project

1.2.1 The aim of the project was:

- To identify the presence/absence of any potential archaeological deposits through an initial gradiometer survey;
- To establish the character and extent of any potential archaeological remains within the site area that could be affected by the proposed works;
- To prepare a report and archive on the results of the geophysical survey.

1.3 Report Outline

1.3.1 This report provides a summary and discussion of the geophysical survey and its results and puts those results within their regional and national context.

1.4 Abbreviations

1.4.1 Sites recorded on the regional Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). Sites recorded on the National Monument Record (NMR) held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) are identified by their National Primary Record Number (NPRN). Scheduled Monument (SM). Altitude is expressed to Ordnance Datum (OD). References to cartographic and documentary evidence and published sources will be given in brackets throughout the text, with full details listed in the sources section at the rear of the report.

1.5 Illustrations

1.5.1 Printed map extracts are not necessarily produced to their original scale.

1.6 Timeline

1.6.1 The following timeline (Table 1) is used within this report to give date ranges for the various archaeological periods that may be mentioned within the text.

Period	Approximate date	
Palaeolithic –	*c.*450,000 – 10,000 BC	Prehistoric
Mesolithic –	*c.* 10,000 – 4400 BC	
Neolithic –	*c.*4400 – 2300 BC	
Bronze Age –	*c.*2300 – 700 BC	
Iron Age –	*c.*700 BC – AD 43	
Roman (Romano-British) Period –	AD 43 – *c.* AD 410	Historic
Post-Roman / Early Medieval Period –	*c.* AD 410 – AD 1086	
Medieval Period –	1086 – 1536	
Post-Medieval Period[1] –	1536 – 1750	
Industrial Period –	1750 – 1899	
Modern –	20th century onwards	

Table 1: Archaeological and Historical Timeline for Wales

[1] The post-medieval and industrial periods are combined as the post-medieval period on the Regional Historic Environment Record as held by Dyfed Archaeological Trust

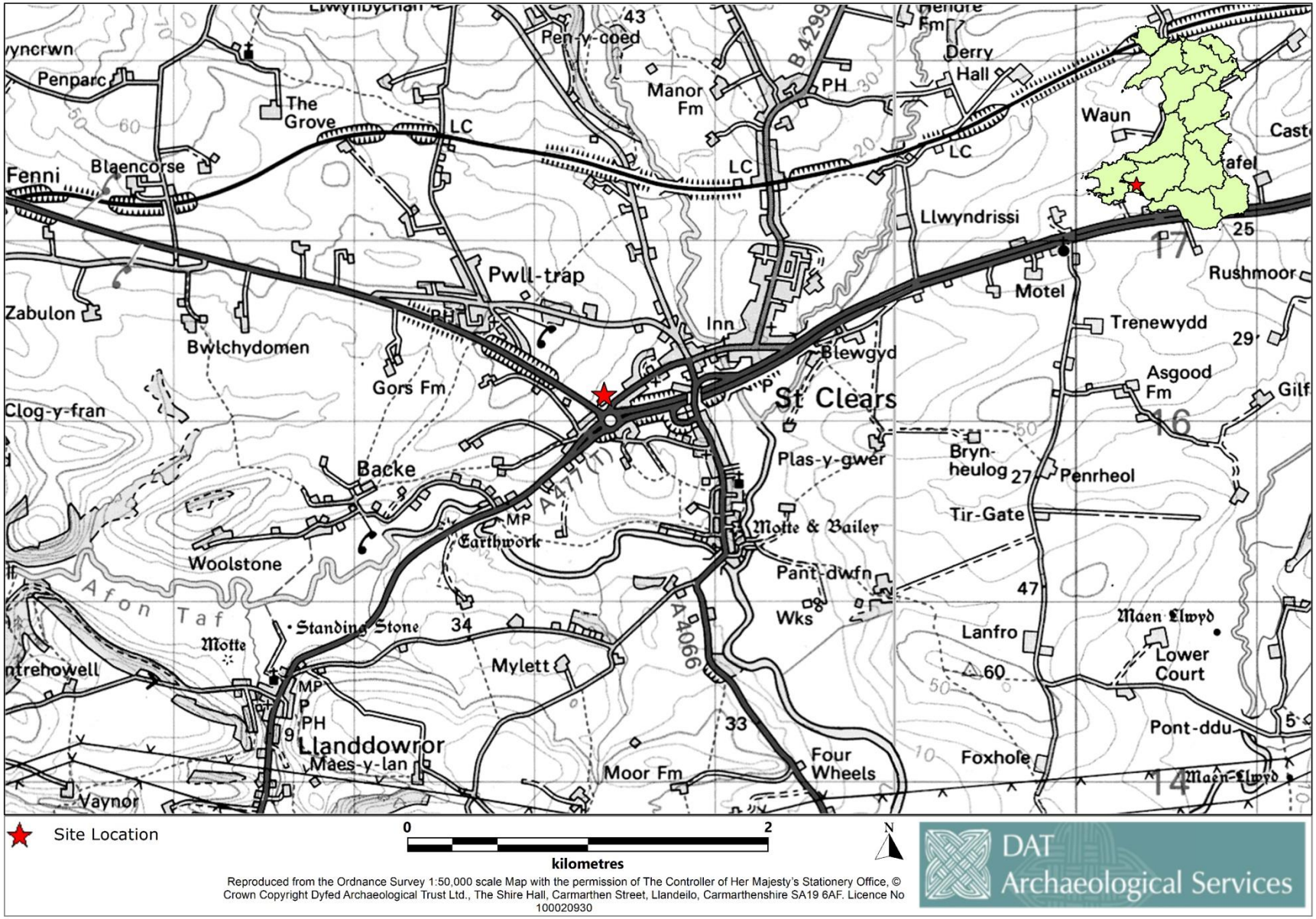

Figure 1: Site location

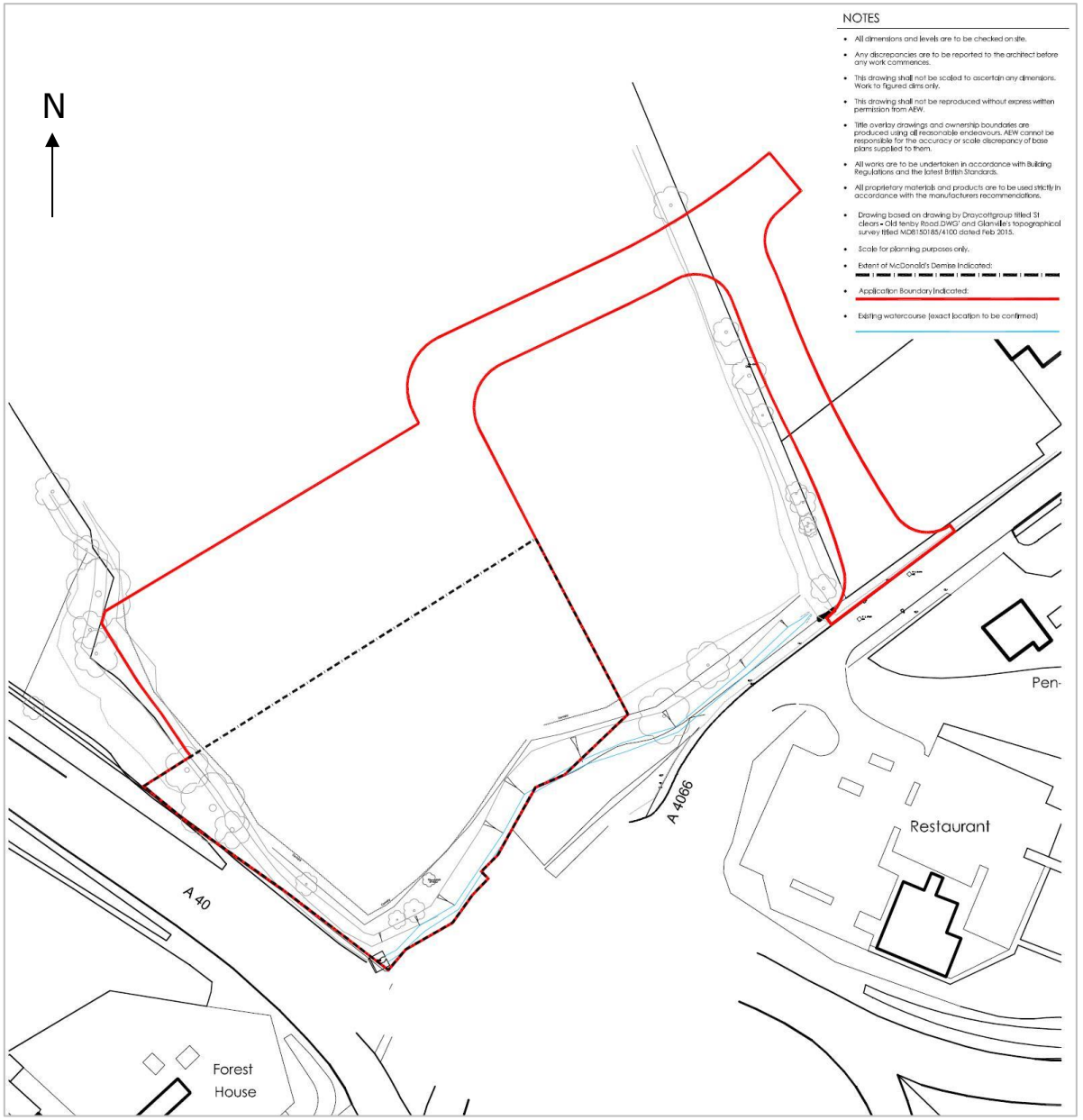

Figure 2: Development area (outlined in red) provided by client.

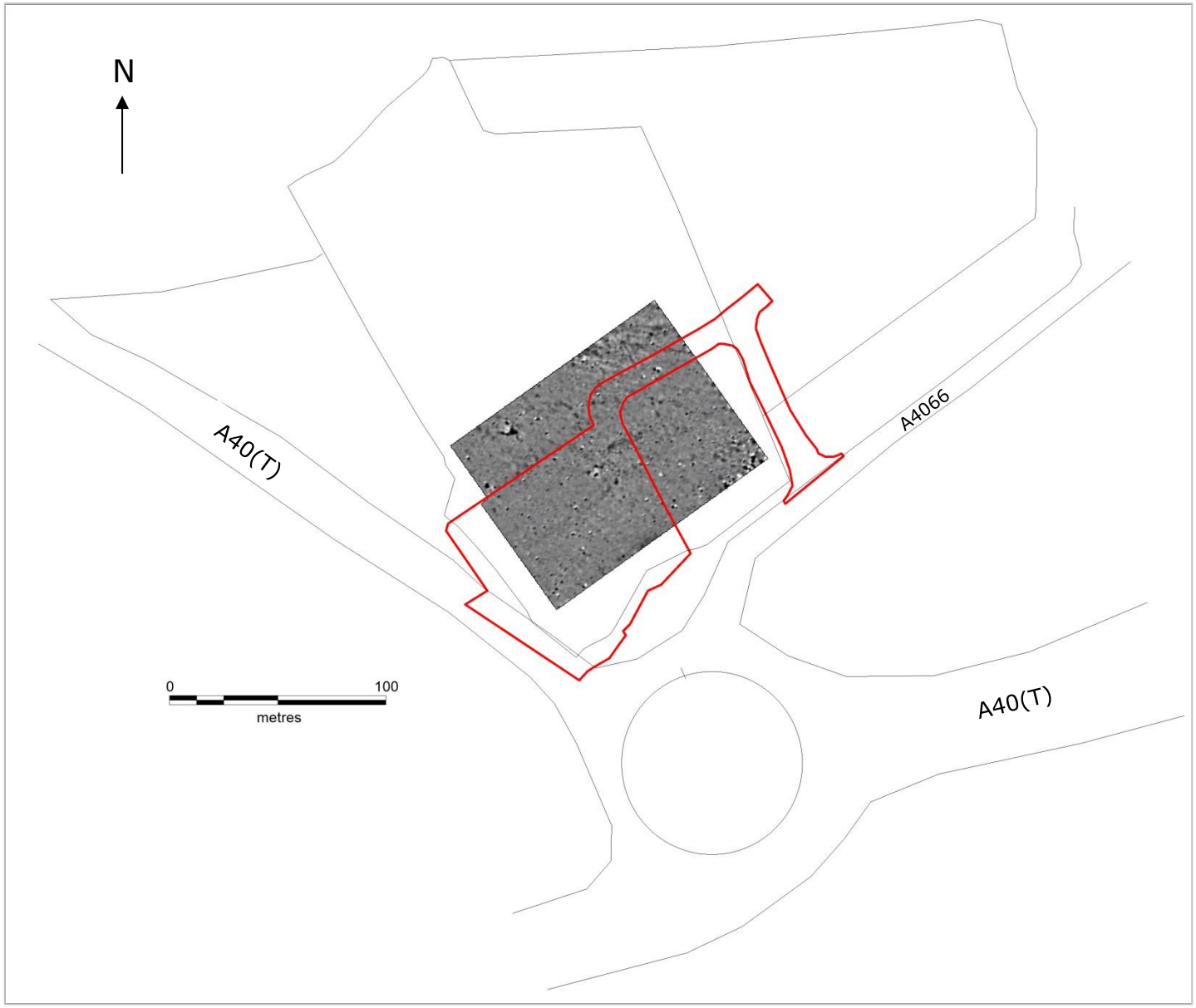

Figure 3: Location plan showing development area and area subjected to geophysical survey.

2. THE SITE

2.1 Site Location and Topography

2.1.1 The following site description is from a desk-based assessment prepared by DAT in 2017 (Day 2017) to accompany the planning application.

The proposed development site is located on Land at Old Tenby Road, St Clears, Carmarthenshire and covers an area of around 1.27ha. It is centred approximately at NGR SN 27383 16129 (Figures 1-2) and lies on the western edge of St Clears, just north of a large roundabout that joins the main A40 trunk road with the Main A477 trunk road. To the east of the roundabout there is the former Little Chef restaurant and an extant Travelodge hotel, and to the west there are residential properties and a petrol station. The proposed site is on agricultural land and there is further such land to the north and east.

The site's lowest point lies at c.25m above OD, at the roundabout, and its highest point it at c.35m above OD, at the northwest corner of the site, giving the overall area a gentle slope. The roundabout and the A4066 road into the centre of St Clears run along the southern boundary of the site and the A40 runs along the western edge. There are mature trees and hedgerows and a stream runs east-west parallel to the southern boundary of the site and just inside it. A ruined house ('Arosfa') is located just beyond the site boundary to the south, between it and the roundabout.

The bedrock at the site is Mudstone with tuffaceous horizons of the Didymograptus Bifidus Beds Formation: Sedimentary rock formed at the Abereiddan Stage. Throughout the site this is overlaid by glacially deposited till (diamicton) of the Devensian Stage.

2.1.2 At the time of the geophysical survey (May 2020) the field had been fallow for some time with short-medium length grass (Photo 1).

Photo 1: View west across the proposed development site.

2.2 Archaeological Potential

2.2.1 A detailed assessment of the archaeological potential of the site has previously been carried out (Day 2017). It is , not reproduced here in its entirety but summarised as follows:

The potential for remains of prehistoric date prior to the Bronze Age is considered to be negligible, based on the fact that there are no known sites within the search area.

One of the field names recorded on the Tithe Map is of 'Lower Stone Park' which could suggest the presence of a former standing stone within the field, although may merely be a reference to the fields location below 'Stone Park' to the north. The field of 'Stone Park' is recorded on the HER (PRN 48826) as the former location of a possible standing stone , typically of Bronze Age date. Within the wider area, human activity at that time is well represented by burial mounds and standing stones and there is a particular concentration of such sites nearby. This fact, together with the presence of streams and a south-facing aspect of the topography, points to a medium potential for undiscovered archaeology of this date, which would be of medium to high significance.

The nearest known archaeology of Iron Age date is only 1.2km away from the proposed site, but there are only 20 known sites within 10km. It is thus considered that the potential for Iron Age archaeology is low, but would have medium to high significance if found.

Potential for Roman archaeology is moderate due to the proximity of an important Roman road, documentary reports of building remains in St Clears, and recently recovered coins possibly associated with these building remains. The significance of newly discovered Roman sites would be medium.

Very few Early Medieval sites are known to exist around St Clears and the potential for unearthing of such sites within the boundary of the proposed development is thought to be low, though they would have high significance. The main focus of early settlement in St Clears is likely to have been located around the church and former Cluniac Priory.

A moderate potential is considered for archaeological remains of medieval date. The presence of former strip farming 'slangs' of medieval date are evident within the proposed development area on aerial imagery. It is also known that nearby Lower St Clears was busy during the medieval period, and there are remnants of strip fields all over the local area. The significance of such remains if they were to be found would be low to medium, entirely dependent upon the rarity of what was found. Remains of strip fields would be considered to be of low significance, but if settlement remains were present these would be of moderate significance.

The assessment of potential for sites that originated in the Post-Medieval or modern periods is to be considered to be low because of the large extent of older, medieval, plough marks within the site. This suggests no development or other activity (other than agricultural) occurred in the development area after the medieval period. Any surviving remains of Post-medieval or modern date would be considered to be of low archaeological significance.

The proposed development site is located close to the site of a crossing of very important road routes that may be millennia old, as evidenced by the line of the Roman road leading west from Carmarthen lying to the north of the site and the lines of the Old Tenby Road and that leading towards Whitland. Human activity may have been focussed at this meeting point over many archaeological time periods. This increases the chances that undiscovered archaeological remains are present close by.

3. METHODOLOGY

3.1 Geophysical Survey

3.1.1 A fluxgate gradiometer with a DL601 data logger was used to conduct the detailed geophysical survey, which detects variations in the earth's magnetic field. A sample interval of 0.25m (four readings per metre) was used with 1.0m wide traverses across 30m x 30m grids using the zigzag traverse method of collecting data. The gradiometers sensitivity was set to detect a magnetic variation in the order of 0.1 nanoTesla.

3.1.2 The survey grid was tied into the local Ordnance Survey grid using a Trimble R8s integrated GNSS with TSC3 controller.

3.1.3 The data was processed using *Terrasurveyor 3.0.36.1* and is presented with a minimum of processing. The presence of high values caused by ferrous objects, which tend to hide fine details and obscure archaeological features, have been 'clipped' to remove the extreme values allowing the finer details to show through. The data has also been 'destriped' to compensate for an imbalance between the gradiometer sensors.

3.1.4 The processed data has been presented as a grey-scale plot, overlaid on local topographical features. The main magnetic anomalies have been identified, and an interpretation of those results is given.

3.1.5 The survey results and interpretation should not be seen as a definitive model of what lies beneath the ground surface, not all buried features will provide a magnetic response that can be identified by the gradiometer. In interpreting those features that are recorded the shape is the principal diagnostic tool, along with a comparison with known features from other surveys. The intensity of the magnetic response could provide further information, a strong response, for example, indicates burning, high ferric content or thermoremnancy in geology. The context may provide additional clues, but the interpretation of many of these features is still mostly subjective.

3.1.6 All measurements given will be approximate as accurate measurements are difficult to determine from fluxgate gradiometer surveys. The width and length of the identified features can be affected by its relative depth and magnetic strength.

3.1.7 The overgrown hedge boundaries that extended into the development area reduced the area accessible for survey (Figure 3).

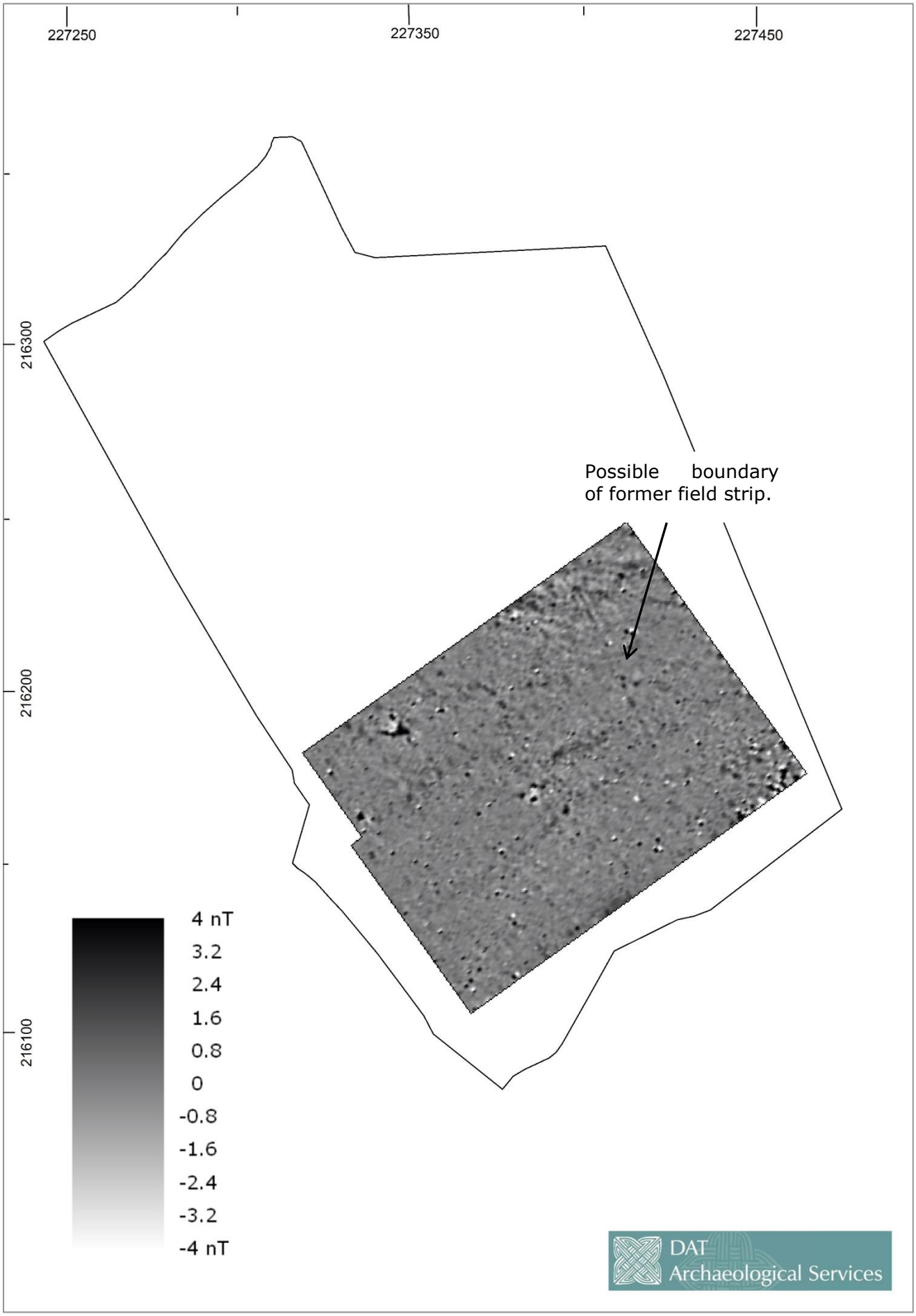

Figure 4: Geophysical survey grey-scale plot.

4. RESULTS

4.1 The geophysical survey results are presented as a grey-scale plot in Figure 4. In total, an area of 1.1ha was surveyed. In general, the quality of the survey results was good. There was limited magnetic variation across the area and little inference from external sources that could mask archaeological features.

4.2 In the survey data a single diffused linear anomaly aligned roughly north-north-west to south-south-east and circa. 50m in length could be seen. This lay on the same alignment as current field boundaries and could be the remnant of a former strip field or 'slang'. Evidence of strip fields in this area was noted in RAF aerial photographs taken in 1946 (Day 2017). No other features indicative of potential archaeological remains were observed in the geophysical survey results.

4.3 The only other anomalies seen in the data represent dipoles (caused by ferrous objects) and possible pit features (of likely natural origin, e.g. tree throw). The possible pits Generally, unless these features form a pattern or a part of a larger feature they are regarded as not archaeologically significant.

5. CONCLUSIONS

5.1 Generally, the quality of the survey data was good; there is limited magnetic variation across the survey area and little to no interference from external sources which could have adverse effects on the data.

5.2 Aside from the possible remnants of a former field strip, the geophysical survey has provided no evidence of potential buried archaeology. It suggests that the proposed development is unlikely to impact upon any buried archaeological deposits or features.

6. SOURCES

Published

CIfA, 2014 *Chartered Institute of Field Archaeologists Standards and Guidance for Archaeological Geophysical Survey*

National Standard and Guidance for Collecting and Depositing Archaeological Archives in Wales 2017. http://www.welshmuseumsfederation.org/en/news-archive/resources-landing/Collections/national-standard-and-guidance-for-collecting-and-depositing-archaeological-archives-in-wales-2017.html

Unpublished Reports

Day, A., 2017. Land At Old Tenby Road, St Clears, Carmarthenshire: Historic Environment Desk Based Assessment. Unpublished DAT Report No. 2017/42

Online resources

British Geological Survey [online] Date Accessed 14th February, 2020.http://mapapps.bgs.ac.uk/geologyofbritain/home.html.

7. GLOSSARY

Fluxgate gradiometer	An instrument used to measure magnetism to search for areas of disturbed ground that may be associated with subsurface archaeological features.
Thermoremnancy	The permanent magnetism acquired by iron minerals that are effectively de-magnetised only to be re-magnetised by the earth's magnetic field. This occurs after being heated to a specific temperature (Curie point) and cooled. Thermoremanent archaeological features include kilns and hearths.
nanoTesla (nT)	A unit of measurement of a magnetic field.
Ferrous Objects	Metals and alloys that contain iron.
Dipole Anomalies	An anomaly consisting of a single positive response with an associated negative response forming a 'halo effect'. The negative and positive response is of equal magnitude but opposite polarity and are caused by the same feature. Dipole anomalies are very commonly observed across a range of sites. Generally, unless the dipoles form part of a larger pattern or feature they are regarded as not significant. They are usually the result of modern ferrous rich debris such as brick and tile fragments as well as objects such as horseshoes or broken ploughshares, which lie within the topsoil.

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