AB HERITAGE
ARCHAEOLOGICAL CONSULTANCY

Pixford Fruit Farm, Ash Priors, Taunton Deane, Somerset

Geophysics Survey Report

Client: ASPIRE PLANNING

AB Heritage Project No: 10492

Date: 15/05/2015

Pixford Fruit Farm, Ash Priors, Taunton Deane, Somerset

Geophysical Survey

Client	**Aspire Planning**
Project Number	**10492**
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Rev Number	Description	Undertaken	Approved	Date
1.0	DRAFT	GR	AB	15-05-2015

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1. INTRODUCTION

1.1 Project Background

1.1.1 AB Heritage has been asked to undertake a geophysical survey on behalf of Aspire Planning, at Pixford Fruit Farm (See Figure 1).

1.1.2 The purpose of this work is to identify any potential surviving archaeological remains.

1.2 Site Location & Description

1.2.1 The site covers one field with a total area of c. 8 hectares, located at ST 15107 30165. The survey area is situated c. 400m to the north of the village of Ash Priors and is bounded on the west side by a narrow road. There are also agricultural fields to the eastern, northern and southern sides of the survey area. The site is under pasture with a pond located within the southern half of the site, which is surrounded by trees.

1.3 Geology & Topography

1.3.1 The underlying solid geology within the proposed development site comprises sandstone of the Otter Sandstone Formation. This was laid down 229–246 million years ago in an environment previously dominated by rivers. No additional superficial geological deposits have been recorded across the proposed development site (BGS 2015). This form of geology is not likely to cause an adverse effect to the collection of the geophysical data.

1.3.2 The topography of the proposed development site slopes down from the west towards the east. The western end of the proposed development site is located c. 105m above OD and the eastern end of the proposed development site is situated c. 97m above OD.

2. AIMS & METHODOLOGY

2.1 Aims of Survey Works

2.1.1 Geophysical survey is a programme of non-intrusive archaeological work. The aims of this geophysical survey were to:

- Identify any geophysical anomalies of possible archaeological origin within the specified survey area;
- Accurately locate these anomalies and present the findings in map form; and
- Provide recommendations for any further archaeological work(s) necessary to contribute to the mitigation of the impacts of proposed development on these potential features.

2.2 Methodology of Survey Works Summary

Site Specific Information

2.2.1 A magnetometry survey was undertaken covering an area of c. 8ha hectares, between Wednesday the 29th of April and Friday the 1st of May.

2.2.2 The AB Heritage staff members who undertook the works were James Dunn (Archaeological Technician), Tom Cloherty (Archaeological Technician), and Glenn Rose (Senior Project Archaeologist).

2.2.3 The weather conditions for the work were mainly dry and sunny throughout the survey; these conditions had no material impact on the survey.

Equipment

2.2.4 The magnetic survey equipment used was one Bartington Grad-601 (fluxgate magnetometers). Please see Appendix A, which contains a detailed methodology for the works undertaken; however, briefly, Table 1, below, shows site specific information on how the magnetometer was set up:

Table 1: Setting Parameters of Magnetometer

Grid Size	30x30 metres
Data Capture Distances	1m x 0.25m
Sensors	2
Sensitivity	0.1nT

2.2.5 A GPS was used to setup the geophysical survey was a Trimble GeoXR has a sub-centimetre accuracy suitable for this survey.

2.3 Known Constraints

2.3.1 The known constraints that are likely to inhibit the geophysical survey were metallic fencing located around the boundary of the site this is likely to produce a c 1-2m disturbance.

2.3.2 Also a pond located within the site meant this area of the survey was un able to be traversed.

3. RESULTS & INTERPRETATIONS

3.1.1 The results have been classified by [**GP**] numbers. All raw and processed data results have been displayed on Figures 2 & 3, with interpretation of results on Figures 4 & 5.

3.2 Geophysical Survey Results

Possible Archaeological Features [**GP 1 a-d**]

3.2.1 Several positive linear and curvilinear features [**GP1-a**] have been identified within the site, the longest of these features runs in a north to south direction and extends up to c.150m in length, with a positive reading of between 0nt (nanoteslas) and 2nt. In addition to this, a feature identified within the south western side of the site has a very strong polarity, with a variation in positive reading of between 2nt - 10nt.

3.2.2 A low negative linear running north to south has been identified within the western side of the site, with a reading of between 0nt and -1nt, stretching to a length of c.150m.

3.2.3 In the western side of the site there is a rectangular feature [**GP 1-d**] covering an area of 250m^2 with a reading of 0nt to 2nt; the feature is situated at the northern end of a negative linear [**GP1-c**].

3.2.4 In the south eastern side of the site there are several three sided features [**GP 1-b**], with varying sizes. The feature situated within the south is the largest of the features covering an area of 750m^2.

Other features [**GP 2-4**]

3.2.5 Magnetic disturbance [**GP 2**] is shown throughout the site, mainly associated with modern utilities [**GP 4**] along the northern boundary of the site. More disturbance [**GP 2**] is shown in the south eastern side of the site with a high variation of reading between -100nt and + 100nt.

3.2.6 The site also has a variable amount of magnetic debris [**GP 3**] situated throughout the site in an amorphous pattern, with the majority of debris identified within the north western corner of the site.

3.3 Geophysical Survey Interpretation

3.3.1 Interpretation of the results of geophysical survey is based on professional judgement as to the likely/probable cause of an anomaly or reading. For example, strong dipolar discrete anomalies of small size are often associated with ferrous debris or similarly magnetic debris. In addition, where a positive linear anomaly is recorded, which has a negative anomaly associated alongside either side of it, is often likely to relate to the line of a modern service

Table 2: Interpretation of Geophysical Anomalies

AB No	Appearance	Potential Cause
GP 1 a	Positive Linear and curvilinear Features	Possible Archaeology- related to field boundaries

GP 1 b-d	Negative area	Disturbed ground
GP2	Varying of negative and positive readings	Made ground
GP 3	Di-polar Anomalies	Amorphous magnetic debris
GP4	High Positive linear with negative associations	Modern Utility

3.3.2 Based on the available evidence, the majority of features recorded as possible archaeological features [**GP 1 a & c**] are likely to relate to previous field boundaries, or agricultural activity.

3.3.3 Features identified within the south western corner of the site [**GP 1b**]; and a rectangular feature identified within the north east corner of the site [**GP 1d**], are likely to be of most interest from an archaeological perspective, with their form and placement being suggestive of archaeological features. The features identified would require further archaeological investigation to understand what they are and level of significance.

3.3.4 In relation to the northern side of the site, the majority of this area contains magnetic disturbance [**GP 2**] associated with a modern utility running through the site [**GP 4**]. The southern side of the site also has magnetic disturbance; with the disturbance in this area most closely associated with made ground, possibly associated with previous construction within this area.

4. CONCLUSION

4.1.1 A geophysical survey was undertaken by AB Heritage Limited at Pixford Fruit Farm, Somerset between Wednesday the 29th of April and Friday the 1st of May 2015. The purpose of this work was to understand the potential for any archaeological remains to survive undisturbed and, where possible, identify the form, function and extent of any potential remains.

4.1.2 The geophysical survey identified possible archaeological features [**GP 1 a-d**] within the boundaries of the site. A number of these are most likely previous field boundaries and associated agricultural activity [**GP 1 a & c**]. However, a range of other features [**GP 1 b & d**] do appear to be more complex in nature and would require further archaeological investigation to ascertain their nature and level of significance.

4.1.3 The southern and northern areas of the site contains likely modern disturbance [**GP 2**] through modern utilities [**GP 4**] and made ground.

4.1.4 Overall, based on the results of the geophysical survey, there is potential for archaeological features to survive within the limits of proposed development site. These include the features [**GP 1 b & d**]. At this time the form, function, extent and significance of these features cannot be established and further archaeological investigation is required to establish the need for and scope of a suitable mitigation strategy, where required.

5. ARCHIVE

5.1.1 The Site Archive will contain the following, as a minimum:

Table 3: Site Archive Data

Archive	Format
Raw Geophysical Data files	XYZ and Text
Processed geophysical data files	JPEG, BMAP
Archaeological Interpretation	Shape Files ARC GIS
Final Report	PDF
Final Images	PDF

5.1.2 A physical and digital archive will be stored in a suitable format at AB Heritage Limited offices in Taunton, Somerset.

6. REFERENCES

BGS (British Geological Society) 2015.*Geology of Britain viewer.* http://mapapps.bgs.ac.uk/geologyofbritain/home.html.

IFA, 2011.Standard and Guidance for archaeological geophysical survey.

Jones, D.M. (ED) 2008. Geophysical Survey in Archaeological Field Evaluation. English Heritage.

Schmidt, A. 2002. Geophysical Data in Archaeology*: a Guide to Good* Practice. Oxford. Oxbow.

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Appendix 1 Technical Information on Geophysical Survey

FLUXAGTE MAGNETOMETRY SURVEY

The magnetic survey is carried out using a fluxgate gradiometer, which is a passive instrument consisting of two sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the top sensor measures the Earth's magnetic field, whilst the lower sensor measures the same field but is also more affected by any localised buried field. The difference between the two sensors will relate to the strength of a magnetic field created by a buried feature, if no field is present the difference will be close to zero as the magnetic field measured by both sensors will be the same.

Factors affecting the magnetic survey may include soil type, local geology, previous human activity, disturbance from modern services etc.

Survey equipment

The Bartington Grad 601-2 dual magnetic gradiometer is capable of surveying to an accuracy of 0.1 nanotesla (nT).

Sample interval and depth of scan

The magnetometer data is collected in 30mx30m grids at a resolution of 1m x 0.25m. This sample density is recommended for site evaluation (English Heritage, 2008). This equates to 3600 points per 30mx30m grid. The magnetometer has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects are buried within the site.

Data capture and processing

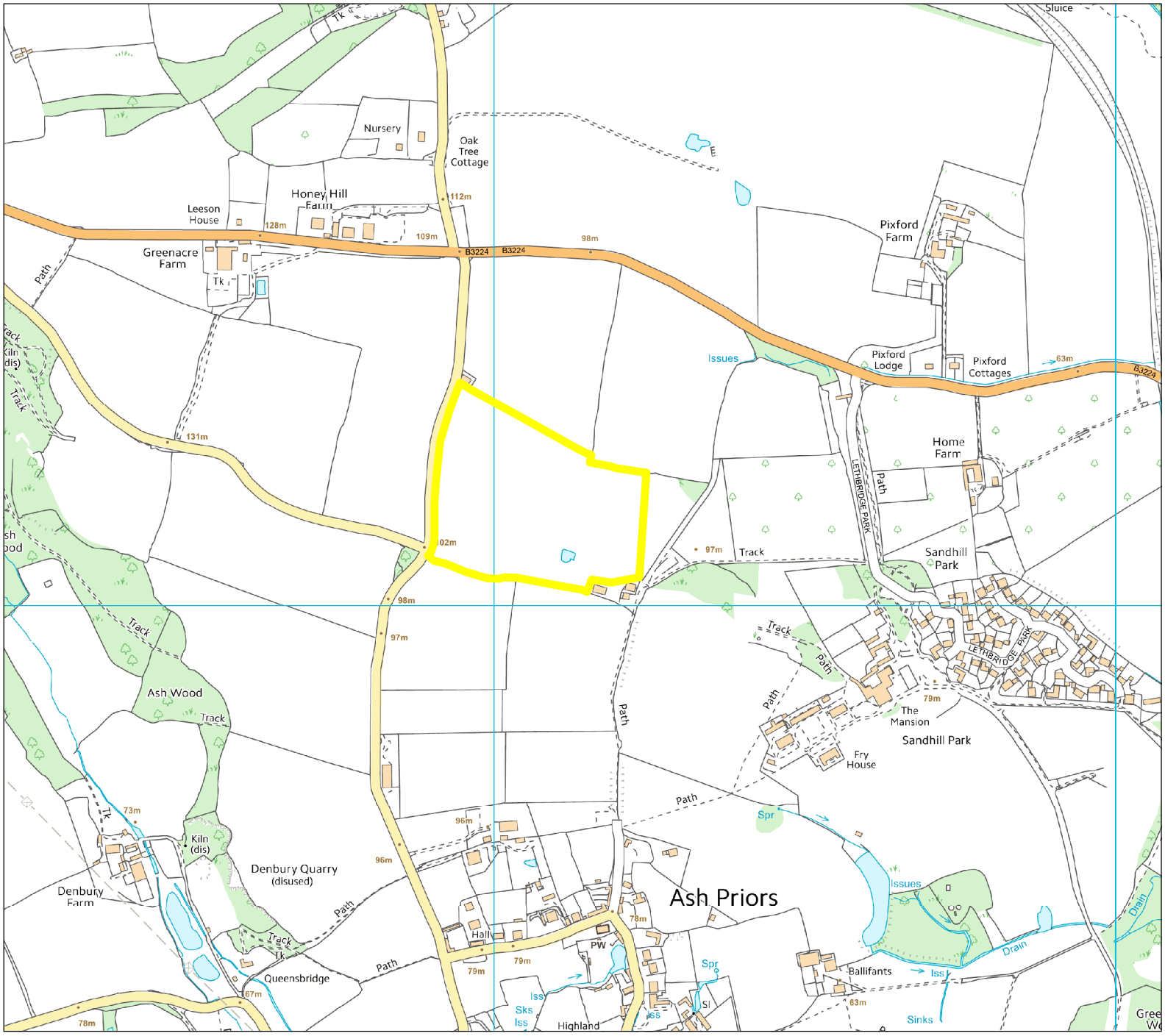
The readings are logged continually by the data logger during the survey, which is then downloaded on site to a site laptop. At the end of each job, data is transferred to the office PC's for processing and presentation.

This 'regular xy' data is then downloaded into specialist data processing software, at user defined sample intervals (in this case 1 m by 0.25 m). This is processed as standard magnetometer data.

GPS METHODOLOGY

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to sub-cm accuracy, a far greater accuracy than a standard GPS unit. An RTK system uses a base station receiver and a number of mobile units (rovers). The base station takes measurements from satellites in view and then broadcasts them along with its known position to the rover receivers. The rover receiver also collects measurements from the satellites in view and processes them with the base station data. The rover then computes its location relative to the base.

During such a survey a Trimble GeoXR Differential Global Positioning System (dGPS), capable of Real Time Kinematic (RTK) is used to set out a nominal grid prior to the survey. This increases the accuracy and efficiency of the survey. The data is then downloaded from the unit on the day, using a USB stick.



0 200 400 800 m

Legend

Site Boundary

Figure 1: Site Location

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Date: 23/04/15	Job Number: 10492
Drawn by: ZE	Approved by: HS

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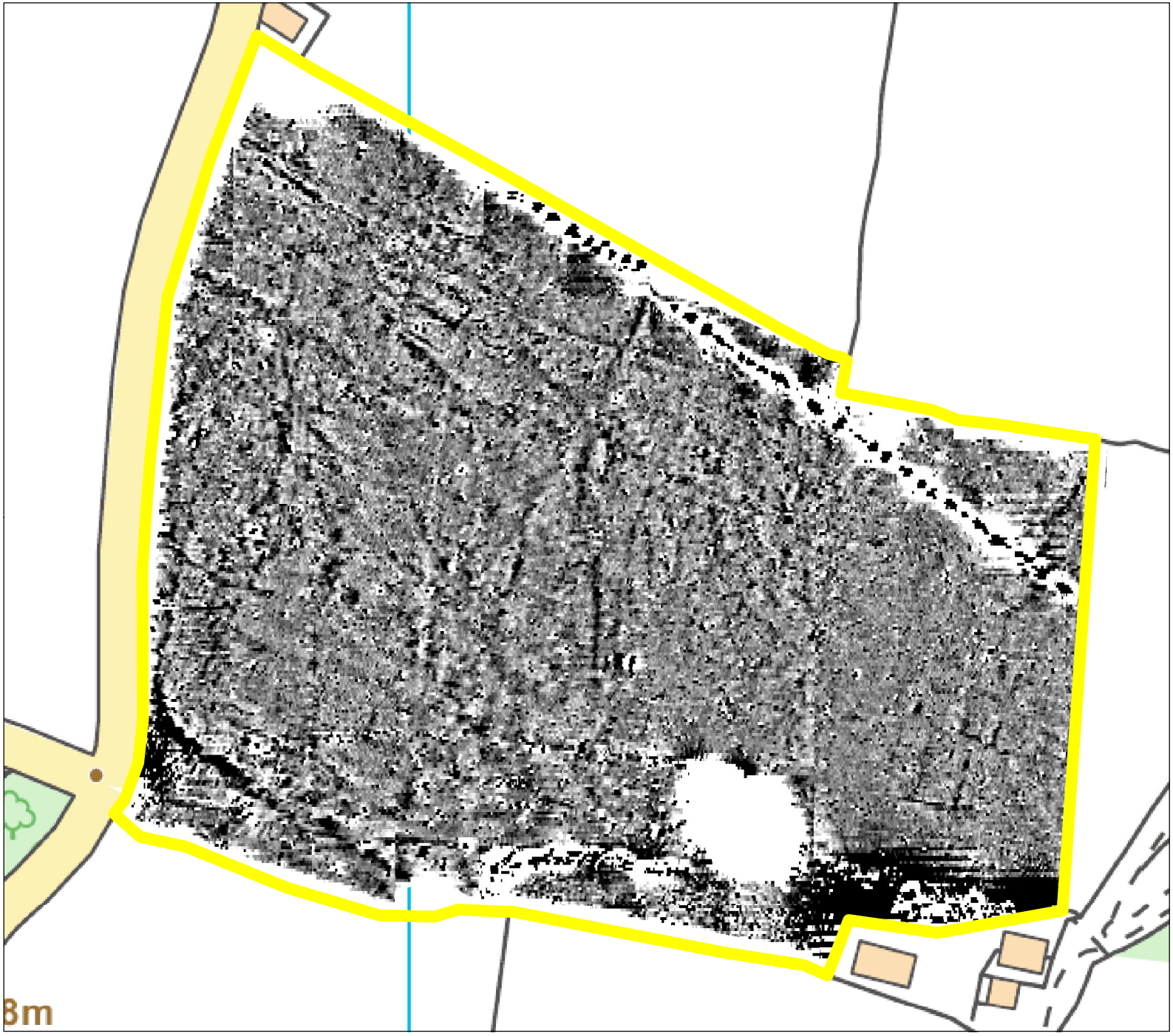

Figure 2: Raw Geophysical Data

Project: Pixford Farm

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Drawn by: ZE	Approved by: GR

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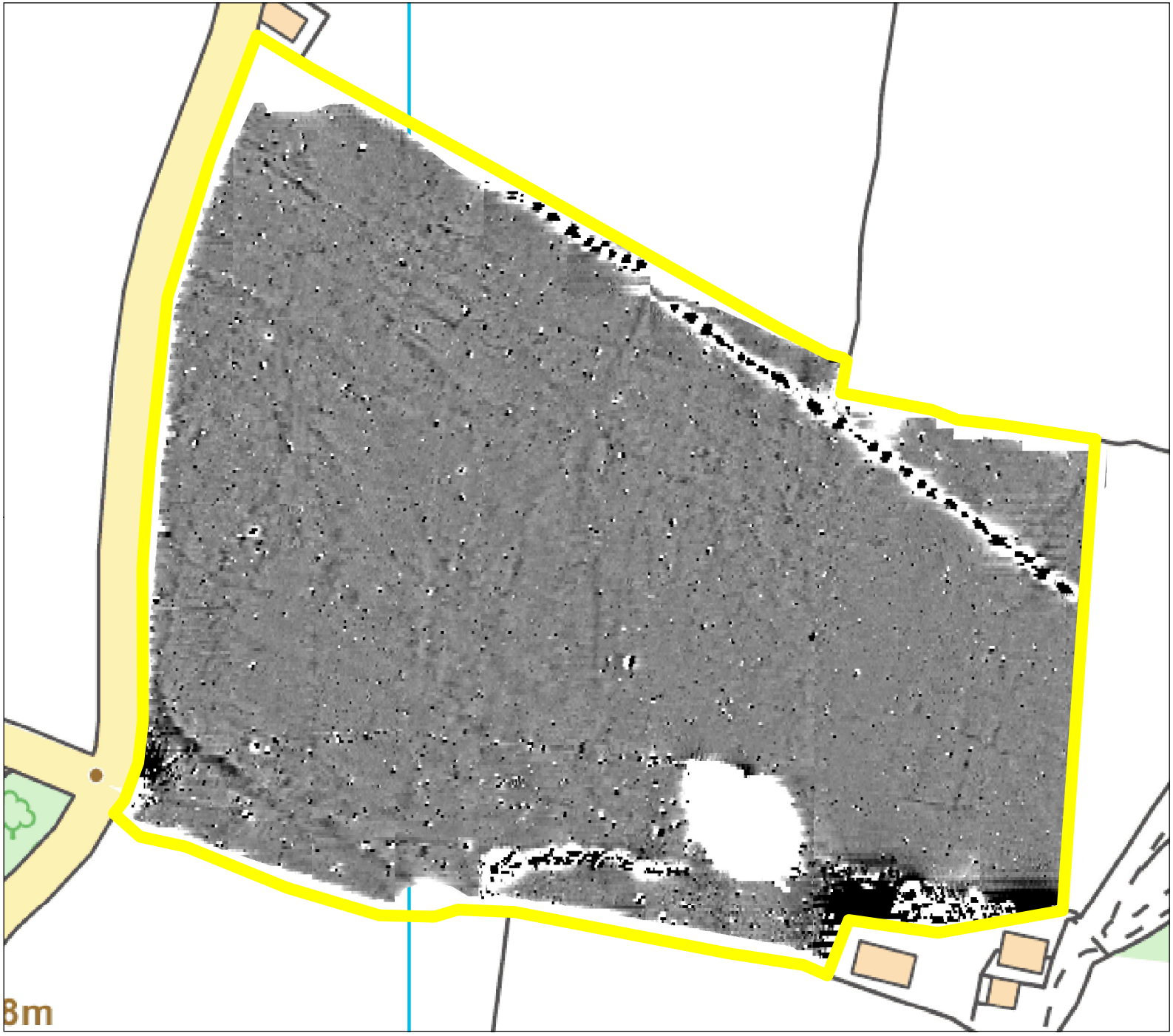

Figure 3: Processed Geophysical

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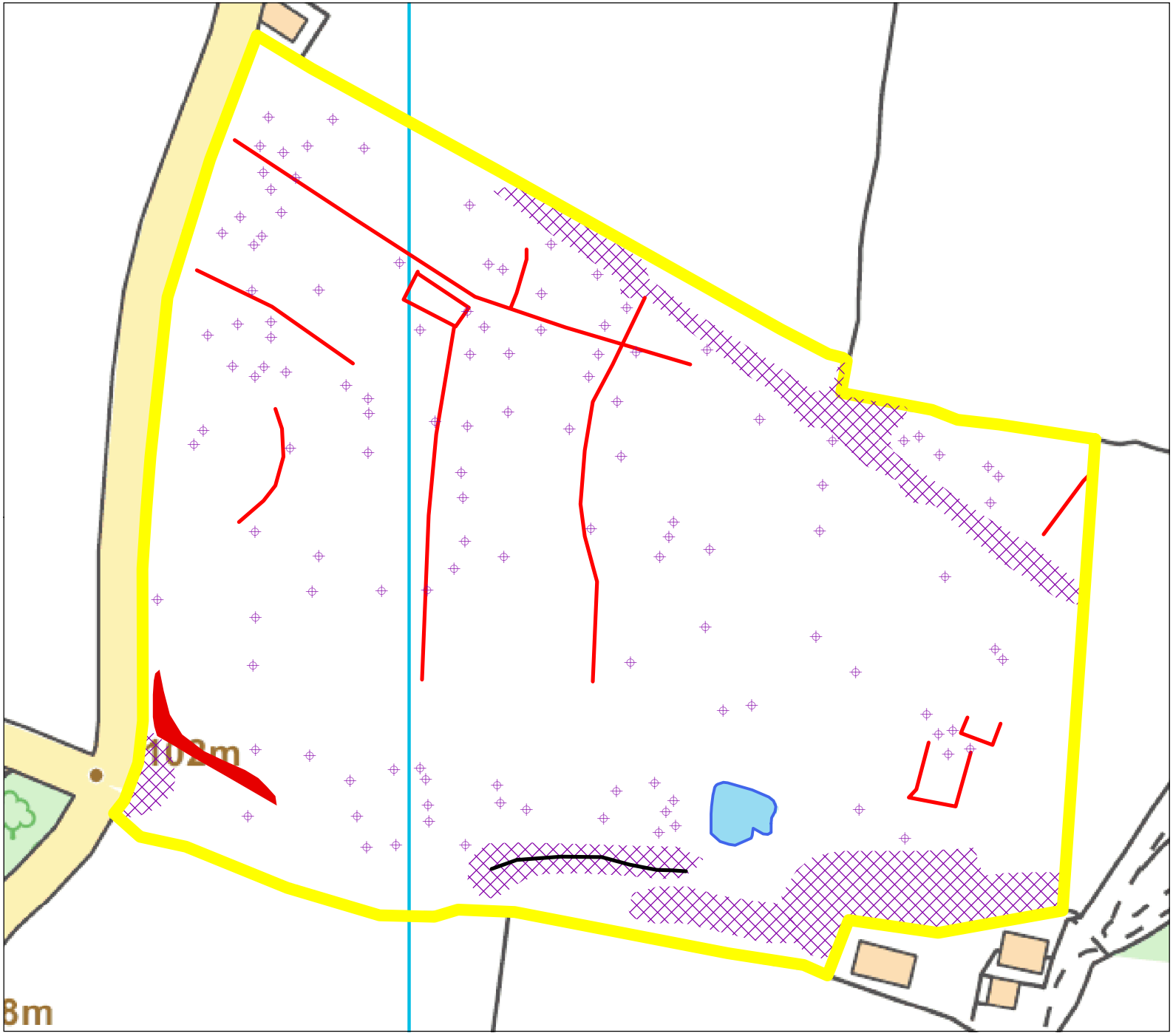

Figure 4: Interpretation of Geophysical Data

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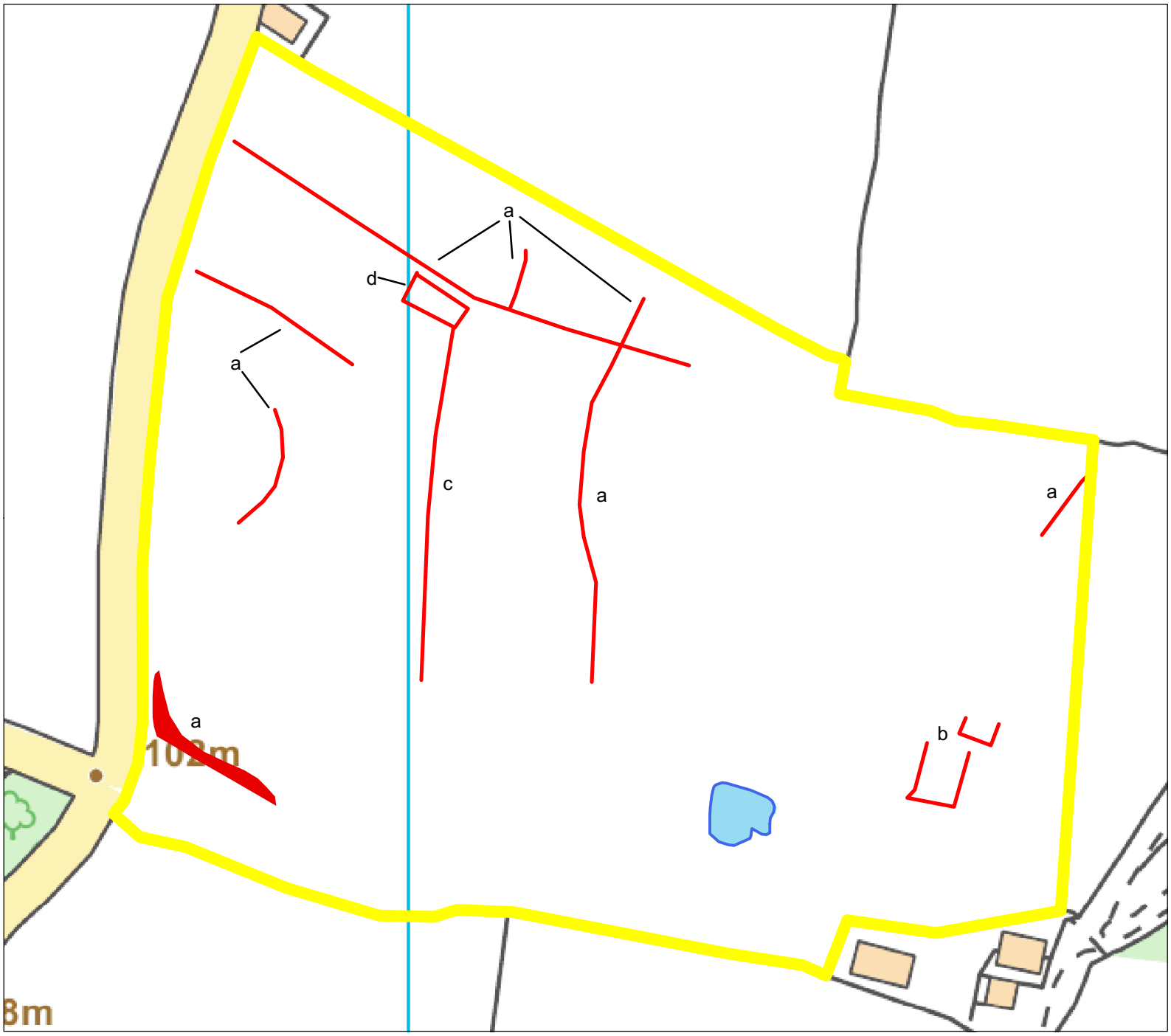

Legend

- Possible Archaeology [GP1] a - d
- Pond
- Site Boundary

Figure 5: Interpretaton of Archaeology

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