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*Engineering Archaeological Services Ltd*

# E O L O G Y

***Kirton Richmonds Field  
Geophysical Survey***

***December 2000***

*Boston Bow*

*Kirton Primary School*



Lincolnshire County Council  
Archaeology Section

0 5. JAN 01

EVBH L11476  
SOURCE L16245  
PRN 13589 L181656  
13589 L113557

*Survey Commissioned  
by  
Archaeological Project Services*

*Surveyed  
by  
I.P. Brooks  
Engineering Archaeological Services Ltd.*

*registered in England  
Nº 2869678*

*Kirton Richmonds Field  
Geophysical Survey*

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*Boston Bow*



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# **Kirton Richmonds Field Geophysical Survey - Introduction:**

**NGR**

***Centred on TF 30853855***

## ***Location and Topography***

*The area surveyed lies behind Station Road, Kirton, Lincolnshire and is bounded on its west by the Kirton County Primary School. The land was flat and had been harrowed*

## ***Archaeological Background***

*The work was commission<sup>ed</sup> in advance of a proposed development on the site.*

## ***Aims of Survey***

*To investigate the development area and to record any magnetic anomalies which are probably of archaeological nature.*

## ***SUMMARY OF RESULTS***

*A number of linear magnetic anomalies of probable archaeological nature were recorded in the southern half of the survey area. Areas of modern disturbance were also noted, particularly along the boundary with Kirton County Primary School. Two feint anomalies are thought to be part of the modern drainage pattern in the field.*



# Kirton Richmonds Field Geophysical Survey -Results:

## Survey Results:

### Area

A single block approximately 180 x 60 m was surveyed, covering approximately one hectare (Figure 1).

### Display

The results are displayed as Grey Scale Image and as X-Y Trace Plots. (Figures 2 and 3)

## Results:

### Detailed Survey:

Eleven 30 x 30 m grids were investigated. (Figure 4) covering the majority of the development area. The western side of the survey area was disturbed along the boundary with the Kirton County Primary School, with the metal fence and a spread of modern rubbish giving rise to the ferromagnetic responses shown in blue on Figure 4. The widening of this disturbed area in Grid 7 is probably partly because of the open access to the field at this point, thus leading to an increased level of modern rubbish. Other factors could be the spread of magnetic material from the store which previously occupied the adjacent plot. Limited modern disturbance is also shown adjacent to the other modern field boundaries.

The two faint linear anomalies in the northern half of the survey area are assumed to be part of the modern drainage pattern for the field as they lead towards the dyke at the northern end of the survey area. These are shown in green on Figure 4

A number of linear anomalies in Grids 2, 3, 7 and 8 are assumed to be archaeological in nature and are shown in red on Figure 4. They would appear to represent a series of linear features, possibly ditches, forming a possible lane running approximately east - west, through Grids 2 and 7. There also appears to be a series of linear features off the possible lane.

## Magnetic Susceptibility

Soil samples were taken from the area of detailed survey in order to assess the magnetic susceptibility of the soils. It was not possible to obtain a subsoil sample for comparison.

Sample	Volume susceptibility $\chi_v$	Mass susceptibility $\chi_m$
Grid 1	45	35.2
Grid 3	41	38.2
Grid 5	30	26.1
Grid 7	36	28.1
Grid 9	28	27.1
Grid 11	28	25.9

The susceptibilities as measured are consistent and moderate in value suggesting that conditions may not have been ideal for magnetic survey. The slightly increased values for Grids 1 and 3 would appear to be consistent with the concentration of anomalies between these two grids.



## Kirton Richmonds Field Geophysical Survey -Conclusions:

### *Conclusions*

*It is a fundamental axiom of archaeological geophysics that the absence of features in the survey data does not mean that there is no archaeology present in the survey area, only that the techniques used have not detected it.*

*A group of magnetic anomalies in Grids 2,3, 7 and 8 would appear to mark a concentration of archaeological activity in this section of the survey area. The initial impression is of a lane crossing the area with a series of associated boundaries.*

*Modern disturbance in Grid 7, unfortunately means that any archaeological anomalies which may be present are obscured in this grid*



# **Kirton Richmonds Field Geophysical Survey - Technical Information:**

## ***Techniques of Geophysical Survey:***

### ***Magnetometry:***

*This relies on variations in soil magnetic susceptibility and magnetic remanence which often result from past human activities. Using a Fluxgate Gradiometer these variations can be mapped, or a rapid evaluation of archaeological potential can be made by scanning.*

### ***Resistivity:***

*This relies on variations in the electrical conductivity of the soil and subsoil which in general is related to soil moisture levels. As such, results can be seasonally dependant. Slower than Magnetometry this technique is best suited to locating positive features such as buried walls that give rise to high resistance anomalies.*

### ***Resistance Tomography***

*Builds up a vertical profile or pseudosection through deposits by taking resistivity readings along a transect using a range of different probe spacings*

### ***Magnetic Susceptibility:***

*Variations in soil magnetic susceptibility occur naturally but can be greatly enhanced by human activity. Information on the enhancement of magnetic susceptibility can be used to ascertain the suitability of a site for magnetic survey and for targeting areas of potential archaeological activity when extensive sites need to be investigated. Very large areas can be rapidly evaluated and specific areas identified for detailed survey by gradiometer.*

## ***Instrumentation:***

***1. Fluxgate Gradiometer - Geoscan FM36***

***2. Resistance Meter - Geoscan RM4/DL10***

***3. Magnetic Susceptibility Meter - Bartington MS2***

***4. Geopulse Imager 25 - Campus***

## ***Methodology:***

*For Gradiometer and Resistivity Survey 20m x 20m or 30m x 30m grids are laid out over the survey area. Gradiometer readings are logged at either 0.5m or 1m intervals along traverses 1m apart. Resistance meter readings are logged at 1m intervals. Data is down-loaded to a laptop computer in the field for initial configuration and analysis. Final analysis is carried out back at base.*

*For scanning transects are laid out at 10m intervals. Any anomalies noticed are where possible traced and recorded on the location plan.*

*For Magnetic Susceptibility survey a large grid is laid out and readings logged at 20m intervals along traverses 20m apart, data is again configured and analysed on a laptop computer.*

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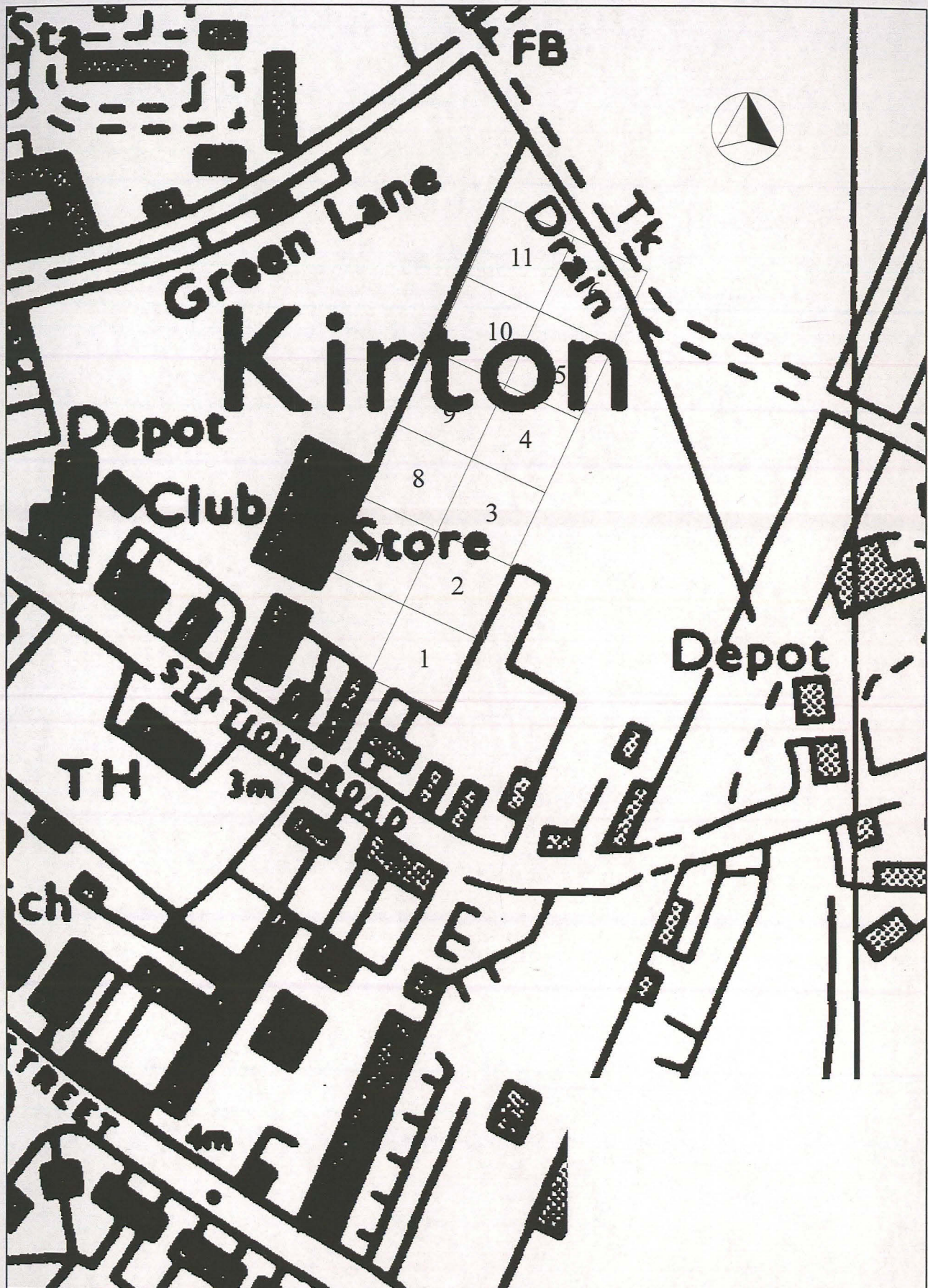
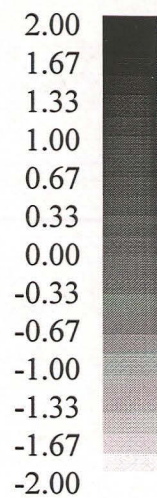
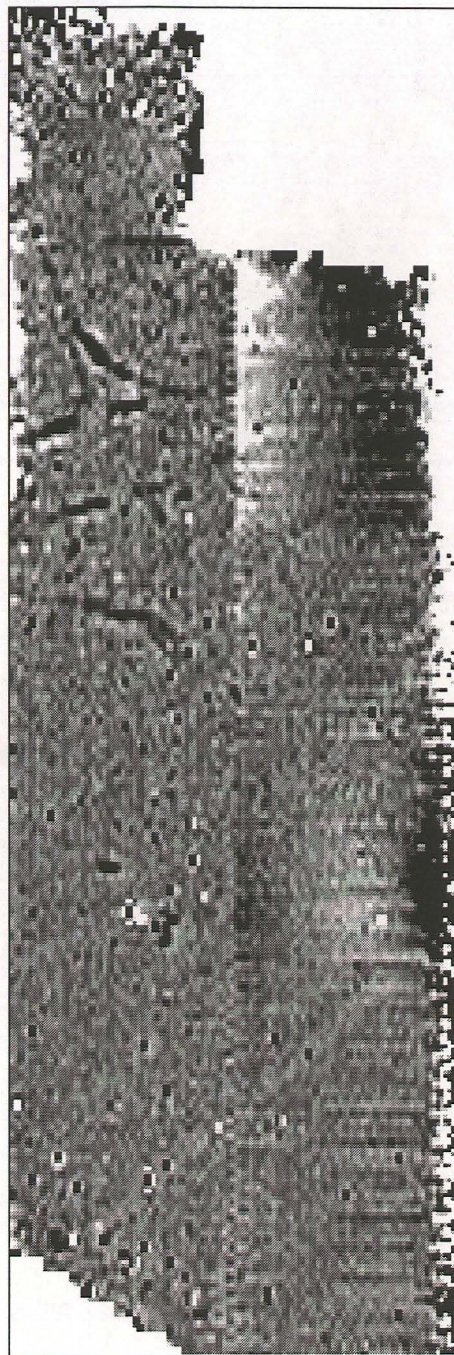


Figure 1: Kirton Richmonds Field  
Location  
Scale 1:2000

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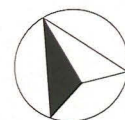
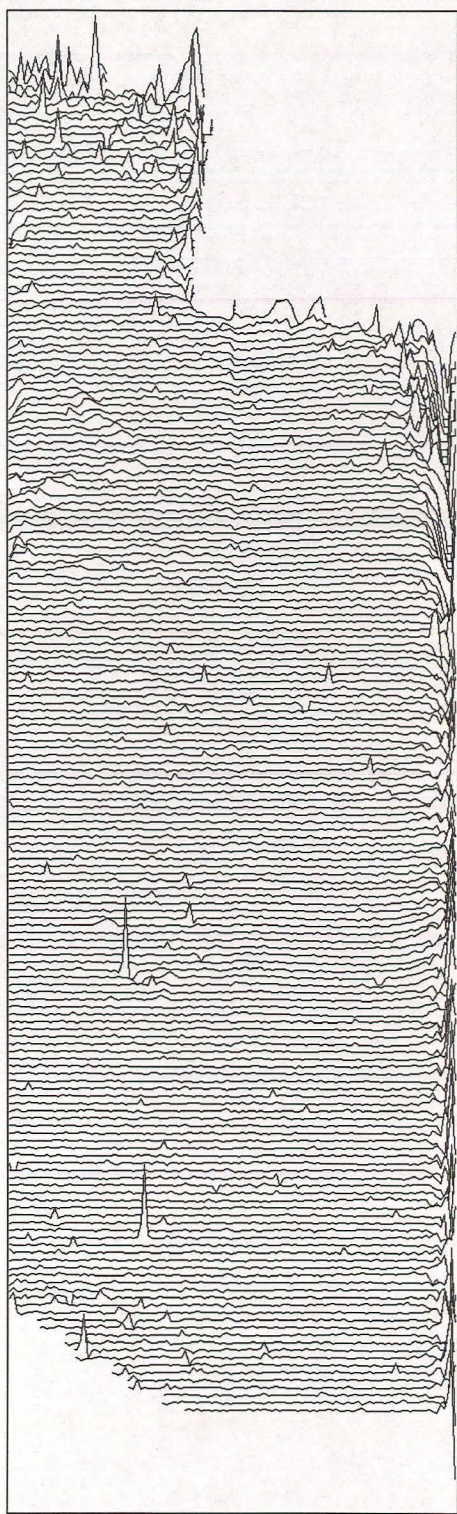


Figure 2: Kirton Richmonds Field  
Grey Scale Plot  
Scale 1:1000





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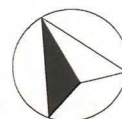


Figure 3: Kirton Richmonds Field  
X - Y Plot  
Scale 1:1000



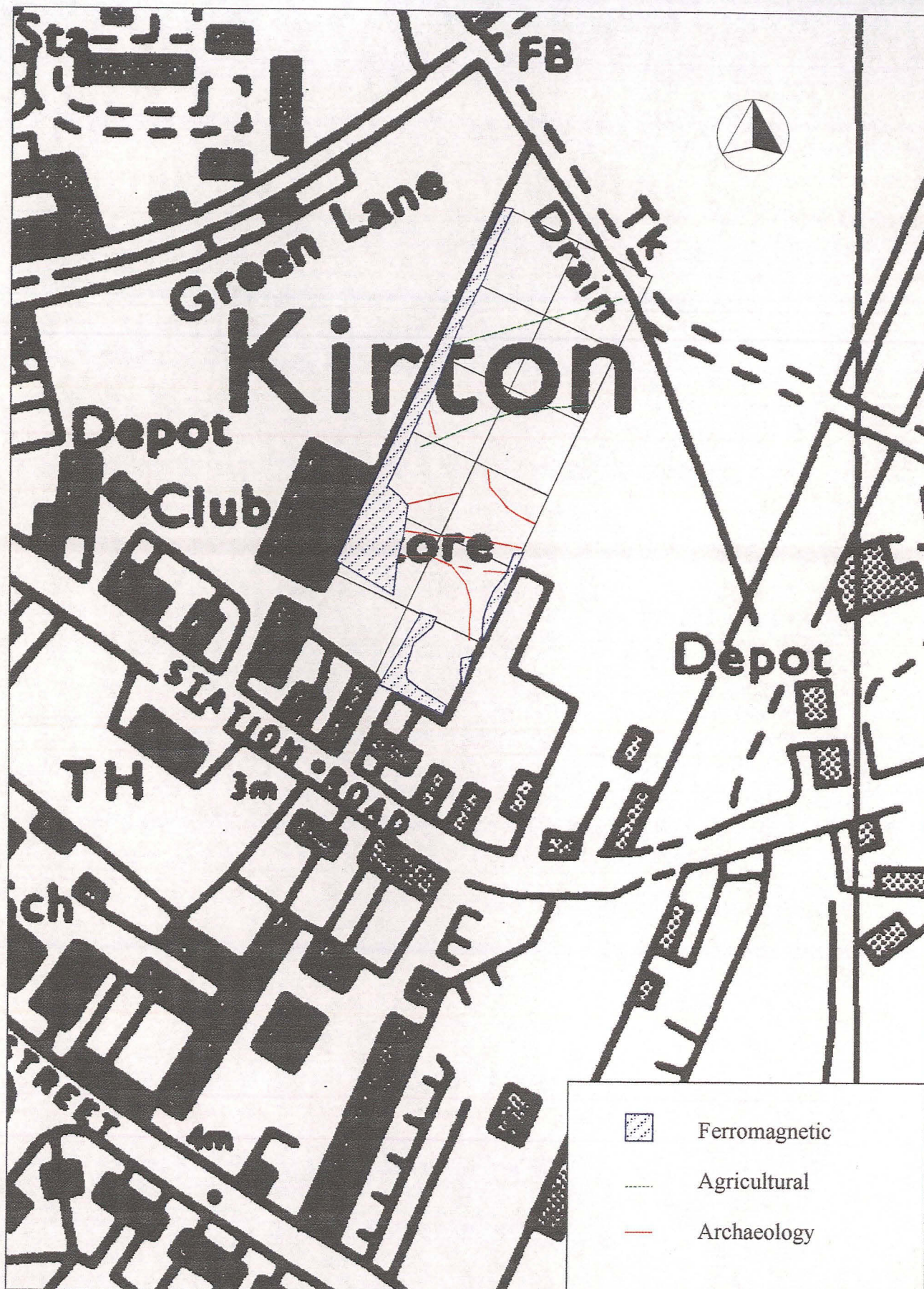


Figure 4: Kirton Richmonds Field  
Interpretation  
Scale 1:2000

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