

# Geophysical Survey of the Caskey Property, Bell Block - Area N

## Executive Summary

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The logo for Geometria, featuring the word "Geometria" in a bold, yellow, sans-serif font.

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## 1.0 Executive Summary

Four areas of the Caskey Property were selected for geophysical survey to investigate potential archaeological deposits: Areas 1, 2 and 3 are located on the ridgeline associated with the Te Oropuriri Pa site. Areas 1 and 2 are a continuation south along the ridge from the pa, while Area 3 is located below and to the west of the main ridgeline. Area 4 is a low hillock with small swamp below, located in the south west of the property (Figure 1). A ground penetrating radar (GPR) and magnetometer were used with distinct subsurface anthropogenic signatures returned for Areas 1-3, and no discernable signatures for Area 4.

The results from Areas 1-3 confirm the extension of Te Oropuriri into the Caskey property although a high response range masking low return signals in the data hindered the extent and identification of potential archaeological features in Area 2. That said it is apparent that subsurface disturbance is occurring along the ridge up to the second knoll. The magnetometer data in Area 3 shows a strong delineation between an area of intensive modification on the west half of the grid and a less disturbed area to the west. It is not clear what this boundary represents; it may be a delineation of a large occupation area within the pa, and the adjacent area might be open space within the pa where no structures were erected. This would be similar to other areas in the already excavated adjacent ground. Several of the anomalies identified in Areas 2 and 3 should be tested to ground truth and confirm the origin of suspected features.

### Area 1

The magnetometer results in Area 1 show a number subsurface anthropogenic anomalies and this is expected given the location, topography and the contiguous archaeology of Te Oropuriri to the north. Two large anomalies (Features 1, 2) that may represent pit or house floor features, a possible pit with metal fill (Feature 3) a large metal anomaly (Feature 4), which may be related to buried material from the adjacent fence line, and two small possible pits (Features 5, 6 – Figure 2). The corresponding GPR data shows several refractions interpreted as anthropogenic and these are mainly recorded in the data from a depth of 0.1m to 1.2m (Figure 3). These are a shallow trench (possibly a modern service trench), a small pit extending to a depth of 0.5m toward the east of the grid, two possible pit features at about 10m along the grid, a deeper possible pit feature that correlates to Feature 1 in the magnetic results, and a possible house floor that correlates to Feature 4 in the magnetic results. Beyond 1.2m deep, refractions from the natural geology begin to appear.

### Area 2

Three main anomalies have been identified in the magnetic survey results: a possible pit or series of small pits, some which have metal fill (Feature 7), a large possible metal anomaly (Feature 8) adjacent to the fence line at about 65m, which may be related to buried material from the adjacent fence line or buried construction material, and a feature undetermined origin (Feature 9) near the eastern end of the grid (refer Figure 2).

### Area 3

Area 3 presents the best results with a number of features identified, and excellent correlation between the GPR and magnetic survey data. A large trench, house floor, possible pit features and an alignment which possibly represents another posthole alignment or filled trench have been interpreted from the magnetic data and these are also identified in the corresponding GPR data. The GPR data clearly shows postholes along the trench and also the area of the house floor. The house floor anomaly position corresponds to the known position of a partially excavated large house projecting from the Te Oropuriri excavations into the

Caskey property. The second posthole/trench alignment is also apparent but it is not completely clear whether this is a filled trench or not. Two pit features are also evident. The large anomaly that cuts diagonally through the southwest corner of the data is significant but difficult to interpret. The sharp linear form would suggest an in-filled ditch or large service feature, but in the GPR cross-section it appears to be more representative of larger refractions, such as large rocks. Feature 10 is interpreted as a house floor and its location and shape correspond to the known location of the partially excavated house on the adjacent Te Oropuriri Pa. Feature 11 is a circular feature, possibly an in-filled rua or fire hearth, while Feature 12 is another possible pit feature with a strong metallic response. Feature 13 is an in-filled ditch with possible postholes. A linear arrangement (Feature 14) is possibly a line of postholes (refer Figure 2). The GPR results for Area 3 show several refractions indicating anthropogenic subsurface features (Figure 4). An alignment of postholes is recorded from 0.1 to 0.6m deep and this alignment corresponds to the trench alignment Feature 13 identified in the magnetic survey data. A grouping of postholes is also evident in the same location where the house floor has been identified in the magnetic survey data. Two possible pits can be seen in the GPR data, which correspond to Features 11 and 12 in the magnetic survey data. Another linear alignment of postholes is located on the right of the grid. A strong set of refractions cutting diagonally across the left bottom corner of this grid starting at around a depth 1m represents a large linear feature, which might be either a filled trench or underground service element.

#### Area 4

Area 4 shows no obvious anthropogenic subsurface modification with large geomorphic lineation running through the grid.



Figure 1: Location of geophysical survey areas 1-3.



Figure 2: Area 1-3 magnetometer results and identified feature anomalies.



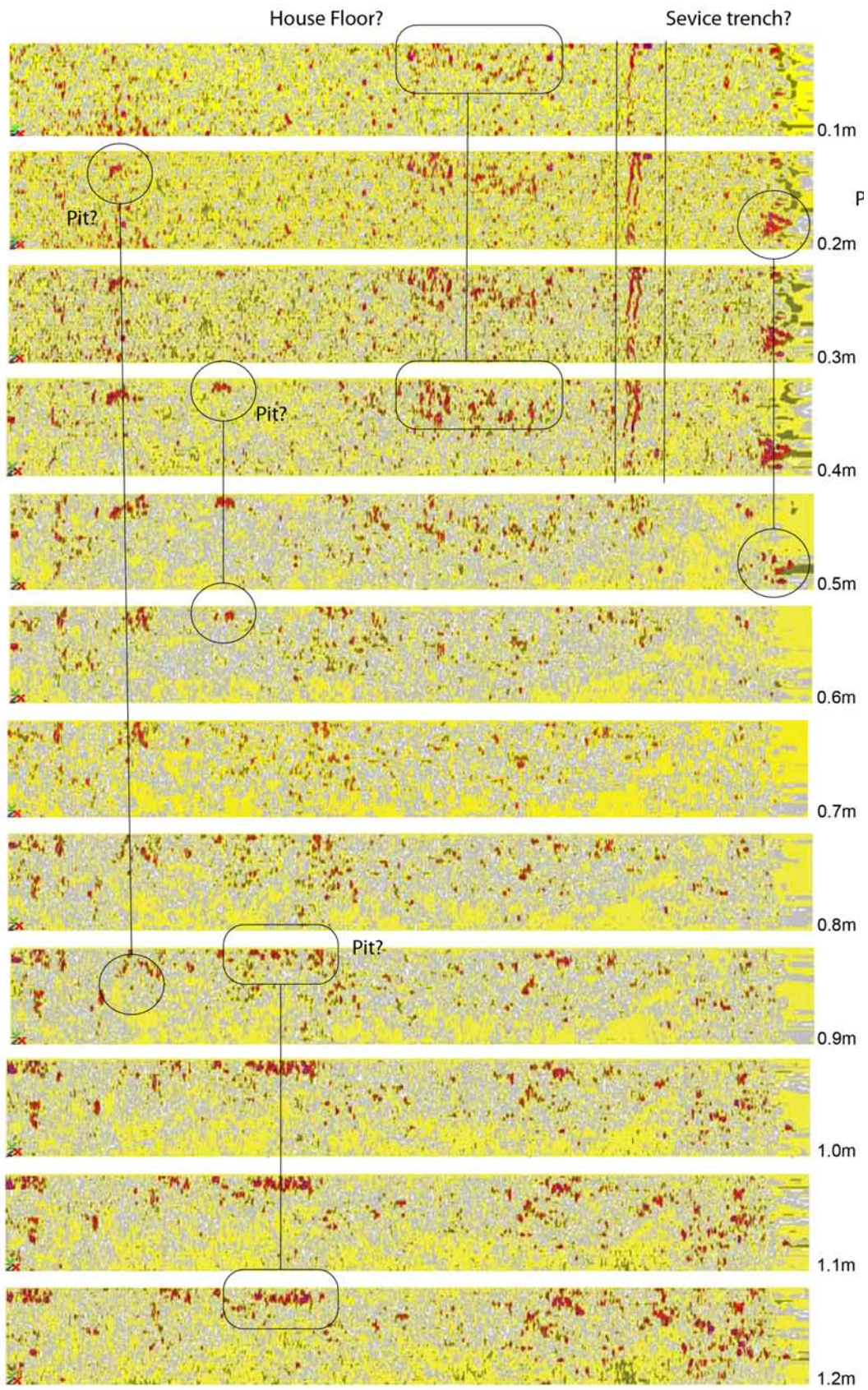
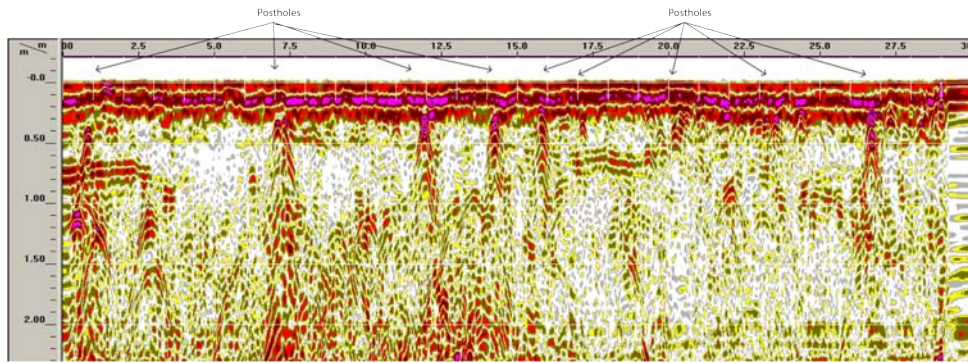
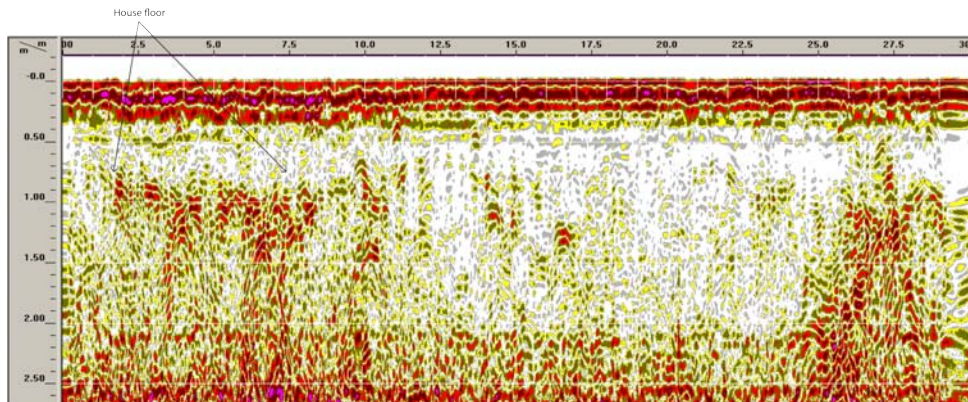


Figure 3: Area 1 GPR results between 0 - 1.2m.

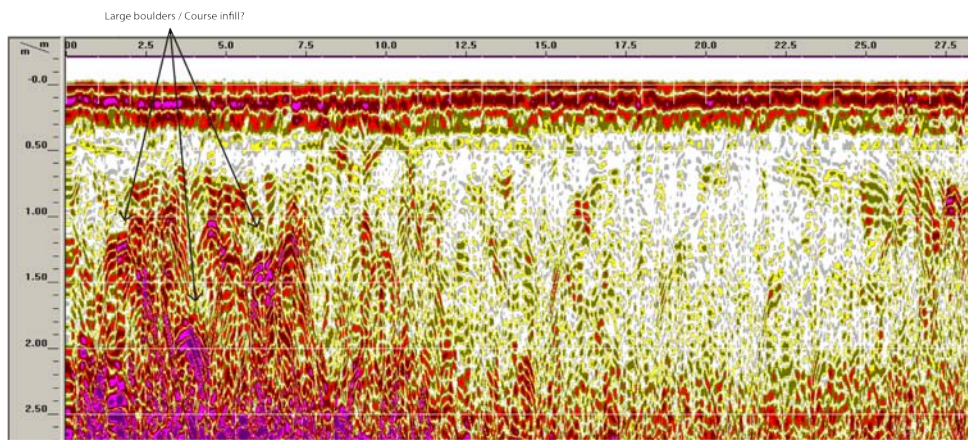




A. Section 1.



B. Section 2.



C. Section 3.

Figure 4: Area 1 GPR depths slices at (A) 1m, (B) 10m and (C) 20m along the grid (D).