4 Armistead Lane, Tamahere: archaeological investigation of site S15/574 (HNZPTA authority 2017/45)

report to
Heritage New Zealand Pouhere Taonga
and
Alandina Harunani

Danielle Trilford

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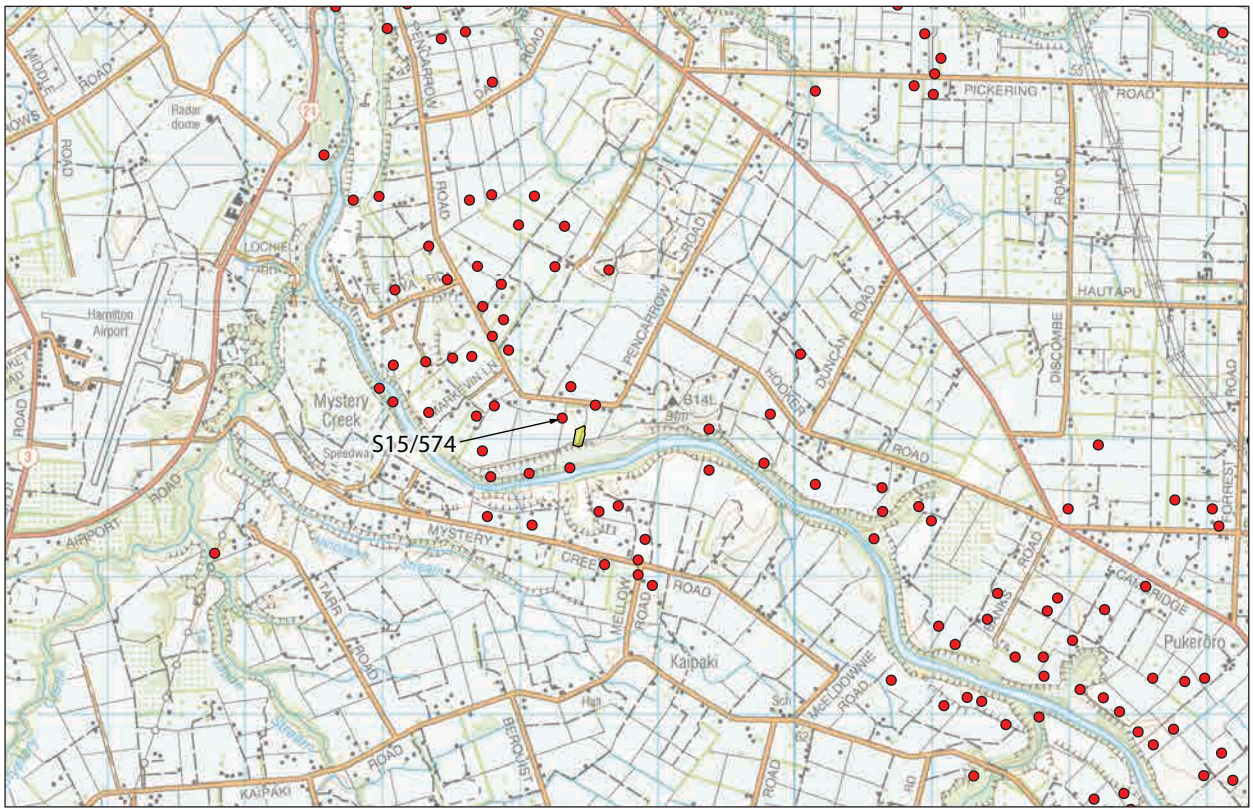
4 Armistead Lane, Tamahere: archaeological investigation of site S15/574 (HNZPTA authority 2017/45)

Danielle Trilford

400 Pencarrow Road, in Tamahere, Waikato, has been subdivided for residential development. One of the subdivided lots, 4 Armistead Lane (Lot 3 DP 436009), contains two borrow pits and associated gardening soils recorded in the New Zealand Archaeological Association (NZAA) Site Recording Scheme (SRS) as part of archaeological site S15/574, which extends onto adjacent properties (Figure 1). Aladina Harunani applied to Heritage New Zealand Pouhere Taonga for an archaeological authority to modify the site. Archaeological authority 2017/45 was granted 16 August 2016. Archaeological investigation of the site was undertaken by Danielle Trilford and Arden Cruickshank of CFG Heritage on 15 and 16 September 2016. Iwi monitoring was conducted by Mandy Hotene of Ngati Haua.

Background

Most of the recorded archaeological sites in the Waikato Basin relate to pre-European Maori gardening. These sites are often in the of form modified soils (often referred to as Tamahere soils), which can be a mix of sand and gravel added to the parent soil to improve the drainage and texture of the soil for tuber growth. These



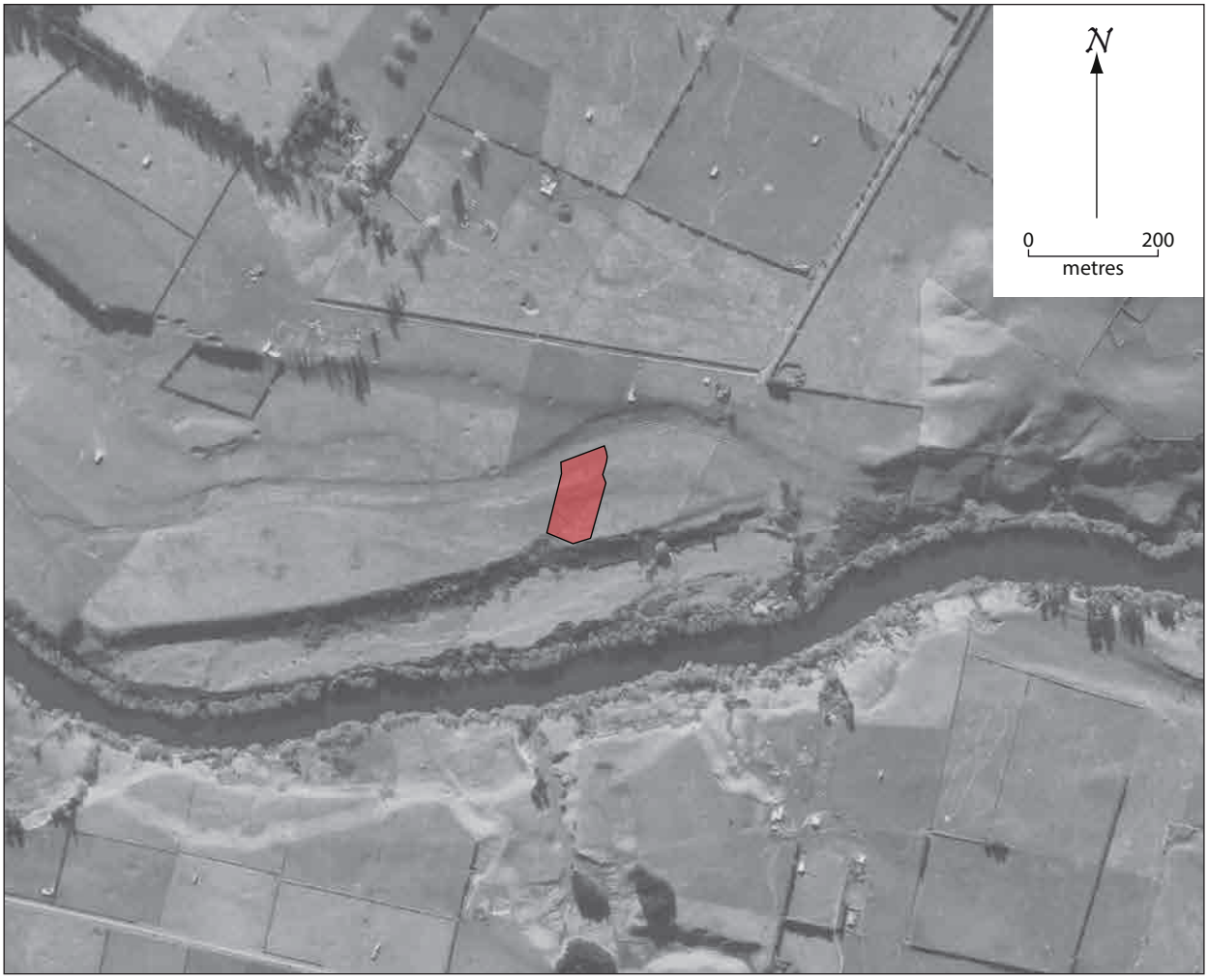
1. Location of Lot 3 DP 436009 and archaeological sites recorded near the project, including S15/574, which is shown outside Lot 3.

sands and gravels are quarried from borrow pits, which are pits dug below the upper volcanic loams to the alluvial pumice layer beneath. The middle and lower portions of the Waikato Basin are estimated to contain over 3000 ha of modified gardening soils.

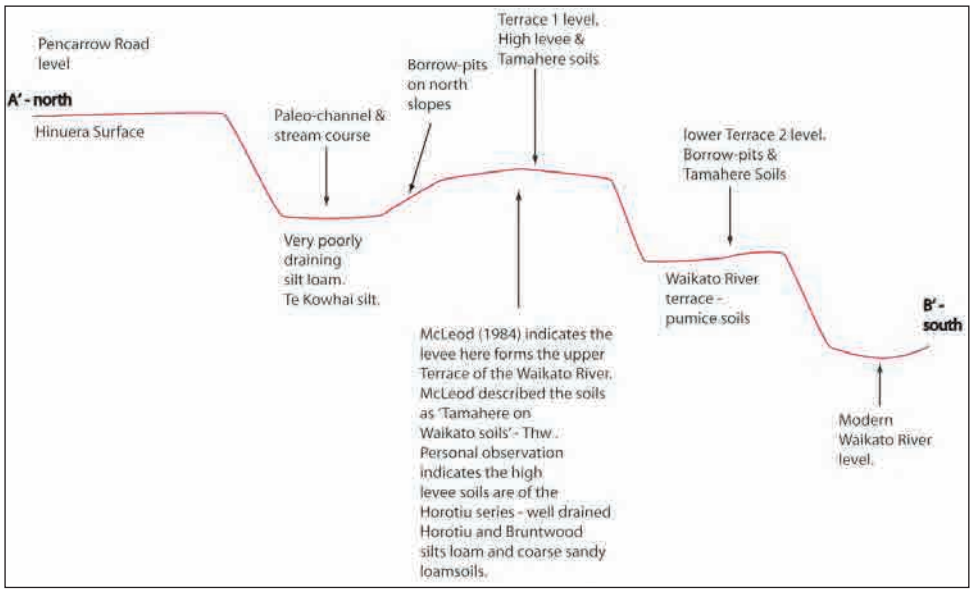
Borrow pits can be up to 15 m wide, and are usually between 1–4 m deep, occurring both singly or in groups. Modified soils are generally found within around 100 m of borrow pits. Many borrow pits and associated gardening soils have been damaged or destroyed by agricultural ploughing and residential development in the Waikato, although some remain in good condition. Aerial photographs of the Waikato region taken in 1943 show numerous borrow pits, including those recorded as S15/574.

Hoffman (2012) investigated the site during roadworks for the subdivision. At that time the site was considered to be part of S15/300, which extends closer to the river, but later that year Campbell (2012) differentiated the borrow pits close to the river (S15/300) from the pits at Pencarrow Road on the basis of aerial photography dating to 1943. These were recorded as S15/574, as seven borrow pits covering an area of 160 x 180 m, based on aerial photograph SN266/834/55 (Figure 2).

The topography of the area between Pencarrow Road and the river (where the site and property both lie) is best summarised in a transect drawing by Andrew Hoffman from the 2012 investigations at the area (Figure 3). It shows the paleo-



2. Detail of aerial photograph SN266/843/55 with Lot 3 DP 436009 highlighted.



3. Transect profile sketch of the topography through Pencarrow Road to the river showing the prominent paleo-channel and main levee running east west on the property (Hoffmann 2012: Figure 3).

channel and its associated levee which once ran through the north of the property. Hoffman's 2012 investigation found extensive soil modification as well as planting hollows filled with sand and gravel, which are often interpreted as the bases of planting mounds (puke). Microfossil analysis identified both kumara (*Ipomoea batatas*) and taro (*Colocasia esculenta*) starch.

The site belongs to a large archaeological landscape: within a 1 km of S15/574 there are three pa (S15/15, S15/25, S15/35); koiwi / human burial (S15/301); as well as many densely packed recorded pre-European Maori gardening sites surrounding it (S15/575, S15/576, S15/577, S15/579, S15/580, S15/581). Most of the surrounding area has not been surveyed by foot and it is likely this portion of the Waikato River contains more unrecorded archaeological sites.

Methodology

Archaeological investigation of the site was undertaken by Danielle Trilford and Arden Cruickshank of CFG Heritage 15 and 16 September 2016. FSix trenches were excavated by an 8 tonne hydraulic excavator where the driveway and house platform were proposed (Figure 4). The trenches did not intersect with any of the borrow pits and the house has been designed to avoid the pits.

Features were excavated either in full or in half section, photographed and recorded following standard archaeological recording methods. The site was also photographed using a quadcopter drone (see front cover image). Spatial information was recorded using a hand held GPS with an error of ± 5 m, and the site was drawn by hand using both GPS points and permanent onsite markers as reference. All spatial information was uploaded to the project GIS. Two charcoal samples were retained for dating and analysis.

Results

Pre-European Maori gardening soils and two firescoops were identified. No artefacts or midden were recovered. Evidence from modern disturbance such as ploughing and the 2012 roading earthworks were also observed (Figures 5 and 6).

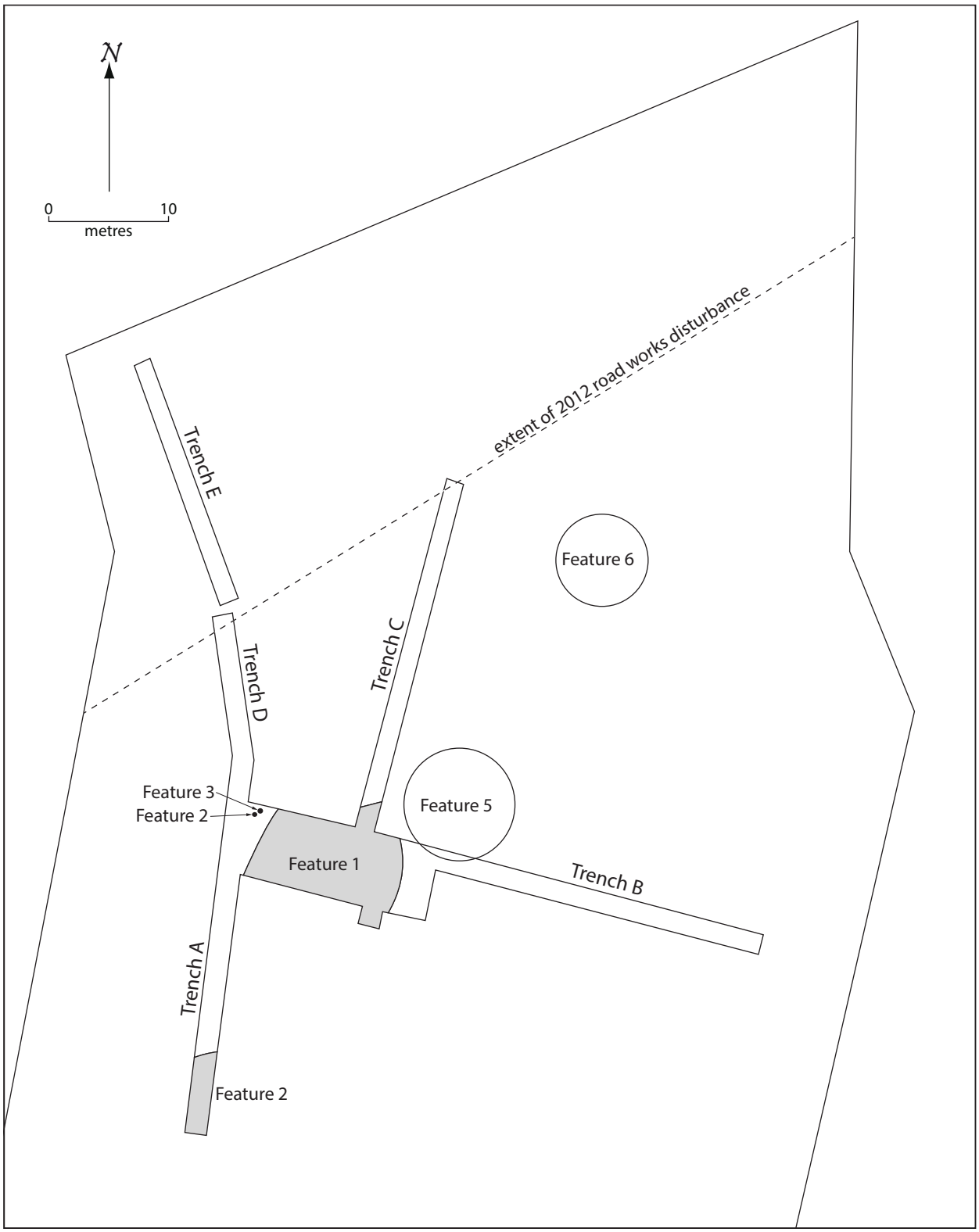


Figure 4. Plan drawing of the 2016 investigations at 4 Armistead Lane.

5. Plough lines in Trench A, facing south (see also cover image).

6. Ground disturbance from the road and services works for the Armistead Lane sub-division during 2012 in Trench E, facing east.

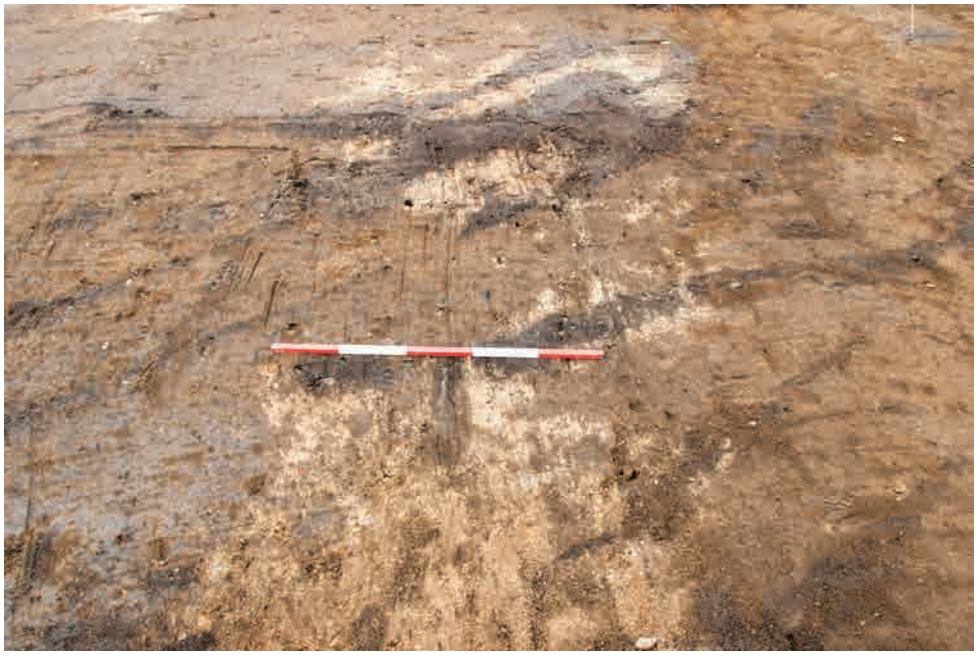
Firescoops

Features 3 and 4 were firescoops isolated within 2 m of each other in Trench B (Figure 7). The features were excavated in half section. Excavated material from both firescoops were sampled for charcoal analysis.

Feature 3 was a circular, bowl-shaped firescoop measuring 600 x 530 mm x 80 mm deep. It contained a charcoal stained loam with inclusions of charcoal and sparse river stones, 30–100 mm in diameter, of which none were fire cracked. The base of the feature was reddened indicating high heat.

Feature 4 was a subrectangular firescoop measuring 1800 x 700 mm x 70 mm deep, with a similar fill to Feature 3, but without the fire-reddened base (Figure 7).

7. Features 3 and 4, both excavated in half section, facing east. Scale = 1 m.



8. Made garden soils (the paler gravelly sediment) present in portions of the trenching during recent works. Scale = 1 m.

Garden soils

Made garden soils, Features 1 and 2, were visible as a sheet mulch of alluvial sands and gravels across parts of the site on the upper level of the levee (Figure 8), in places damaged from ploughing (Figure 9). Some of the deposits were in better condition than others; isolated portions were best preserved in Trench A and at the intersection of Trench B and C (Figure 4). The deposits varied in thickness between 80–200 mm.

9. Plough lines in made garden soils.

Charcoal analysis

Charcoal samples from the two firescoops (Features 3 and 4) were submitted to Dr Rod Wallace of the Anthropology Department, University of Auckland, for species identification and environment reconstruction (Appendix A). Both samples contained tawa (*Beilschmiedia tawa*) and matai (*Prumnopitys taxifolia*), while Feature 3 also contained maire (*Nestegis cunninghamii*). The species indicate the charcoal came from a mixed conifer and broad-leaf forest, suggesting undisturbed mature bush in the surrounding area.

The charcoal samples Hoffman's 2012 inevstiagtion were puriri and matai, also two large-forest species (Hoffmann 2012: 12). The samples came from the base of the paleo-channel; none of the samples were appropriate for chronological dating. The results were interpreted to represent prehistoric burn-off of land that had a virgin forest cleared for pre-European Maori horticulture.

Chronology

A sample of matai charcoal from Feature 3 was submitted to the University of Waikato Radiocarbon Laboratory for radiocarbon dating. The results provided a bimodal distribution, with one mode from cal AD 1500–1600 and one from 1610–1650 at a 95% confidence interval (Table 1). The presence of large virgin forest species used in the fires suggests the first mode (AD 1500–1600) is likely, when large stands of untouched forest still stood, and no secondary regrowth shrub species were yet common. Similar results have been reported from S14/198 at Taupiri (Campbell and Harris 2011) and S14/222 at Horotiu (Hoffman 2011).

Lab No.	CRA BP	cal AD 68%	cal AD 95%
Wk 44490	342 ± 20 BP	1510–1580 1620–1640	1500–1600 1610–1650

Table 1. Radiocarbon date.

Discussion and conclusion

This investigation, coupled with Hoffman's (2012) investigation, indicates that the site was occupied in the 16th and possibly through to the 17th century by a group of highly skilled gardeners, typical of pre-European Maori communities in the Waikato. The occupation was probably cut into land which was under virgin bush. Only a small portion of the site has been investigated and the remaining subdivision of Armistead Lane at S15/574 will provide important information to better understand:

- chronology and temporal depth of human occupation at the site;
- archaeological evidence of methods and processes of pre-European Maori horticulture, such as the possible deep tilling of sediments observed in 2012 investigations;
- archaeological features below the ground surface that are underrepresented in the area to better inform occupation patterns across the Waikato Basin, such as storage pits and houses.

Site damage

The Tamahere gardening soils of the site have been moderately disturbed due to farming and from Armistead Lane road and services installation. A large portion of the site is likely to be further destroyed by future residential development. House construction at 4 Armistead Lane will avoid the visible borrow pits which will be preserved in situ.

Site use and models of prehistoric settlement

The 2012 works by Hoffmann provided evidence that S15/574 was used for pre-European Maori horticulture. The recent excavation supported this, as well as exposing evidence of burning, possibly for cooking and gardening. It appears the results are one of, if not the only, chronologically dated archaeological sites in Tamahere. Neither excavation discovered any faunal remains, but the extent of excavation is small when the scope of the site is considered. Despite this, it appears that gardening and cooking were carried out from an early (16th century) date. The date provides an important temporal baseline for understanding Tamahere's gardeners, which can be built on with future investigations to inform research around settlement patterns near the Waikato River. The results from this investigation can be applied to test three settlement models of Waikato's prehistory that were proposed during large-scale investigations during the Waikato Expressway construction (Campbell 2012):

- Model 1 – Simultaneous settlement
  Settlement in the Waikato occurred everywhere at the same time, in the 16th century, starting in small local pockets then eventually merging. There was no sole focus or a particular resource use in the economy.
- Model 2 – Simultaneous settlement along the river
  Settlement in the Waikato started early 16th century, people arrived already knowing how to modify the ground for gardening, and horticulture was the main economic activity. During the 17th century people also began living in swamp pa areas, as competition for riverside land increased driving some people inland.
- Model 3 – Gradual settlement
  Occupation extended up the river and its tributaries gradually, one occupation at a time. Small groups of people eventually moved out to land away from the river and to the swamps.

The limited results of the current investigation can support Models 1 and 2, but cannot be applied to Model 3 without additional dates from the surrounding archaeological landscape. To test whether Model 1's proposition that neither horticulture nor exploitation of swamp and other wild resources were the sole central focus of the economy, investigations of contemporaneous sites in the Waikato must be compared. Similarly, at a glance, Model 2 looks promising to explain settlement of the area, but it requires a wider understanding of occupation at Tamahere and inland sites. Because the great majority of development driven archaeology has been associated with projects close to the river, we currently lack a good understanding of the timing and nature of settlement away from the river. Future investigation across the wider Waikato Basin should provide data that enables us to test these models.

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Appendix A Charcoal analysis

Introduction

2 charcoal samples from excavations at site S15/574, Waikato, were submitted for identification and C14 dating sample extraction. The results are given below.

Sample 1 (S15/574 - F.3 – Firescoop)

Tawa	5
Maire	1
Matai	3
Matai twig	1

NB. The Matai twig was separated out as a (tiny) C14 dating sample.

Sample 2 (S15/574 - F.4 – Firescoop)

Tawa	15
Matai	5

NB. No material suitable for C14 dating.

Discussion

All the charcoal present was from large forest tree species possibly indicating mature bush dominated the surrounding area.

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Thursday, 17 November 2016

Radiocarbon Dating Laboratory

Report on Radiocarbon Age Determination for Wk- 44490

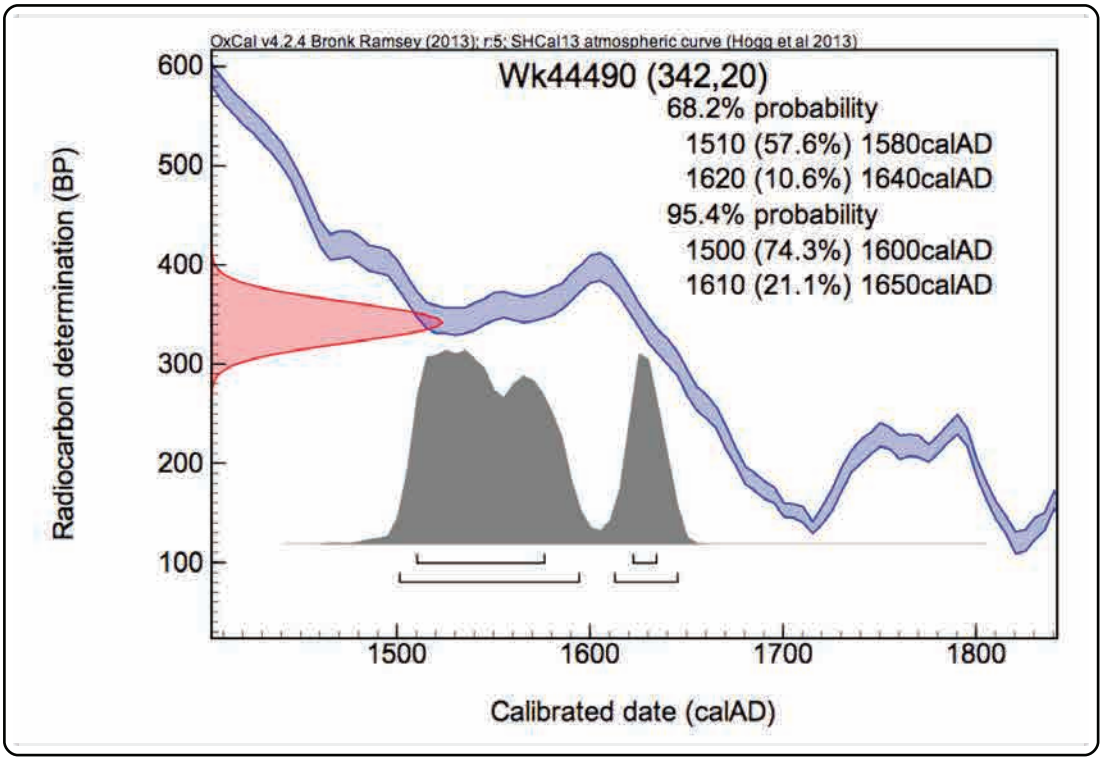
Submitter	D Trilford
Submitter's Code	Sample 1
Site & Location	S15/574, New Zealand
Sample Material	Matai twig
Physical Pretreatment	Sample cleaned.
Chemical Pretreatment	Sample washed in hot HCl, rinsed and treated with multiple hot NaOH washes. The NaOH insoluble fraction was treated with hot HCl, filtered, rinsed and dried.

$D^{14}C$	-41.7 ±	2.4 ‰
$F^{14}C$%	95.8 ±	0.2 %
Result	**342 ± 20 BP**	

(AMS measurement)

Comments

Please note: The Carbon-13 stable isotope value ($\delta^{13}C$) was measured on prepared graphite using the AMS spectrometer. The radiocarbon date has therefore been corrected for isotopic fractionation. However the AMS-measured $\delta^{13}C$ value can differ from the $\delta^{13}C$ of the original material and it is therefore not shown.



- Explanation of the calibrated Oxcal plots can be found at the Oxford Radiocarbon Accelerator Unit's calibration web pages (http://c14.arch.ox.ac.uk/embed.php?File=explanation.php)
- Result is *Conventional Age or Percent Modern Carbon (pMC)* following Stuiver and Polach, 1977, Radiocarbon 19, 355-363. This is based on the Libby half-life of 5568 yr with correction for isotopic fractionation applied. This age is normally quoted in publications and must include the appropriate error term and Wk number.
- Quoted errors are 1 standard deviation due to counting statistics multiplied by an experimentally determined Laboratory Error Multiplier.
- The isotopic fractionation, $\delta^{13}C$, is expressed as ‰ wrt PDB and is measured on sample CO_2.
- $F^{14}C$% is also known as *Percent Modern Carbon (pMC)*.