

**ARCHAEOLOGICAL INVESTIGATIONS OF SITE  
U14/3524, 543 JOYCE ROAD, WATER TREATMENT  
PLANT RESERVOIR DEVELOPMENT  
(HNZPTA AUTHORITY 2017/43)**

**REPORT TO  
HERITAGE NEW ZEALAND POUHERE TAONGA  
TIAKI ENGINEERING  
AND  
TAUANGA CITY COUNCIL**

**DANIELLE TRILFORD AND PETER HOLMES**

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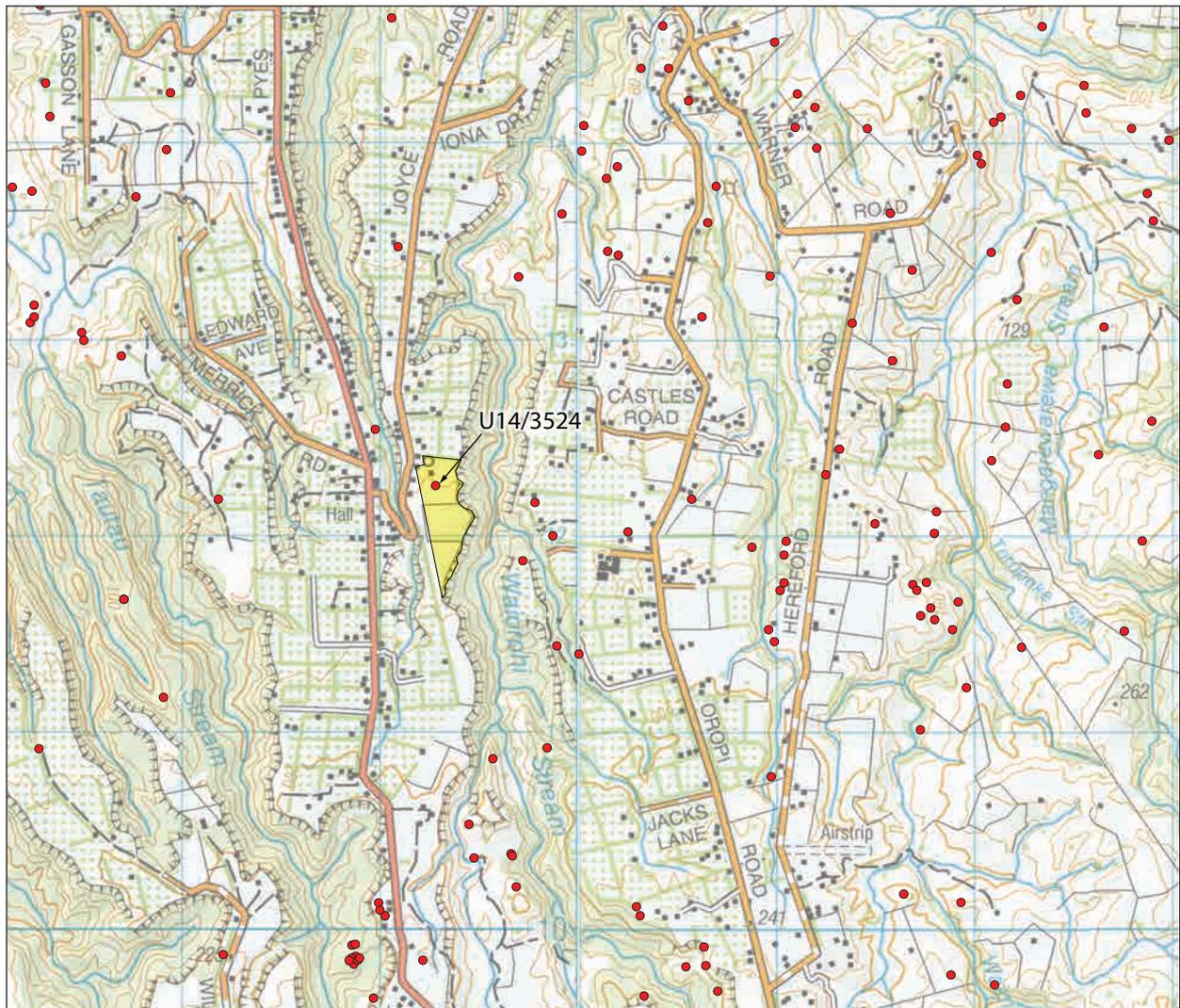
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# ARCHAEOLOGICAL INVESTIGATIONS OF SITE U14/3524, 543 JOYCE ROAD, WATER TREATMENT PLANT RESERVOIR DEVELOPMENT (HNZPTA AUTHORITY 2017/43)

DANIELLE TRILFORD AND PETER HOLMES

Tauranga City Council (TCC) have installed a new water reservoir at 543 Joyce Road, Pyes Pa (Pt Lot 1 DPS 7506). Tiaki Engineering applied for an archaeological authority from Heritage New Zealand Pouhere Taonga (HNZPT) for the associated earthworks on behalf of TCC. HNZPT Authority 2017/43 was granted and earthworks were monitored by Peter Holmes of CFG Heritage Ltd between 30 November and 19 December 2016. Four archaeological features were exposed, one midden and three midden-filled firescoops near each other (Figure 1). These

*1. Location of 543 Joyce Road (Pt Lot 1 DP 7506) showing archaeological site U14/3524 and surrounding archaeological sites.*



features were recorded as a new site U14/3524 in the New Zealand Archaeological Association (NZAA) Site Recording Scheme (SRS). Kararaina Walker, Neville Walker, and Lance Waka of Ngati Ruahine were also present.

## Background

The Bay of Plenty is well known for its mild climate, fertile soils and abundant shellfish and fish populations which supported a large pre-European population, and the region has one of the highest densities of archaeological sites in the country (McFadgen 2007: 173).

Several waka are recorded as having visited Tauranga, including Takitumu, Tainui and Te Arawa. From the crews of these waka, particularly Takitumu, Waitaha a Hei and Ngati Ranginui were descended. These hapu occupied Mt Manganui and Mauao until Ngaiterangi displaced them in the 18th century (Stokes 1980).

At the time of European contact, Ngaiterangi were in possession of the Tauranga area, although Waitaha and Ranginui identities survived. Ngati Maru and Ngati Tamatera attacked Otumoetai, Te Papa and Maungatapu pa in 1828 killing many inhabitants and enslaving others (Phillips and Arabin 2004: 4).

### *19th century history*

Although European traders and explorers had been visiting the Bay of Plenty since the late 18th century, European settlement did not start in earnest until the arrival of Christian missionaries. The C.M.S schooner Herald was probably the first European vessel to enter Tauranga Harbour in 1826 (Stokes 1980: 45). The first mission was set up in the 1830s at Te Papa, with a standing presence from 1838 onwards. The mission house is still located on Mission Road.

The first organised trade in the region began in 1830 when Phillip Tapsell settled at Maketu as a flax agent for Sydney based firm Jones and Walker. This became a large operation, employing hundreds of local Maori in flax cultivation and preparation (Stokes 1980: 53).

### *The New Zealand Wars*

In the mid-19th century, increasing numbers of Europeans and the subsequent pressure on the government to release more land for these immigrants caused tensions both within Maori and between Maori and the government. Eventually tensions boiled over and fighting began between the Kingite aligned Maori and the government throughout the North Island.

The Bay of Plenty did not escape this unrest. Due to their connection to the Waikato Maori, many Tauranga Maori were involved in the fighting and the government were convinced that guns and supplies were being smuggled from Tauranga to the front. The government sent troops to Tauranga to ensure that those going off to war, and any supplies headed in the same direction, were stopped (Stokes 1980).

Although the role of the government troops was initially as a defensive force (akin to a modern-day peacekeeping force), the local population saw it as a government attempt to take their land. Once word spread that the government forces had landed at Tauranga, many returned, with numbers bolstered by other iwi (Stokes 1980). This led to hostilities in Tauranga, and fighting commenced with the battle of Gate Pa on 29 April 1864, in which the Government forces were repelled with heavy losses. A number of small skirmishes followed Gate Pa, with the decisive battle occurring at Te Ranga on 21 June 1864.

Details are sketchy on how the Government forces were made aware of the fortifications being built at Te Ranga, but it appears the defences had only just begun to be built when Government forces arrived. Following bombardment from two 6 pounder Armstrong guns, the Government forces stormed the partially finished trenches resulting in more than 100 Maori being killed. These Maori were buried in their trenches, which were then filled in (Cowan 1955).

There have been several attempts in the intervening years to relocate the trenches, due to discrepancies between survey maps, diaries and hand drawn maps of the battle (Phillips and McCaffrey 2015, Gallagher and Sturrock 2015). Due to the cultural sensitivity surrounding the battleground, typical exploratory methods were never feasible. Bruce McFadgen (1977) undertook a magnetometer survey where he suggests the trenches are located within a 5m wide strip behind the concrete cairn. This result was far from conclusive, and advances in remote sensing equipment in the past 40 years may help to pinpoint the battleground features in the future.

Recent archaeological works in the vicinity of the property have also tried to determine the location of the trenches and other associated works from the battle. The most potentially promising of these was the monitoring of a water main trench by Archaeology B.O.P (Phillips and McCaffrey 2015) which ran down Pyes Pa Road. This trench should have intersected the Maori trenches if they were in the location McFadgen had suggested, but nothing was noted within the profile. An attempt to geo-reference a hand drawn map from the battle proved somewhat limited, but indicates that the trenches could lie further south than the current marker, near the intersection of Kennedy Road and Pyes Pa Road.

MishMish Heritage Ltd monitored topsoil stripping on the property 4km north of the project area at 219 Pyes Pa Road in March 2016, due to its proximity to Te Ranga, and the possibility that the location of the 6 Pound Armstrong gun and the 43rd and 68th regiments was on the property as indicated by Cowan's sketch map. No evidence of the battle was uncovered, but pre-European features were identified and were recorded as site U14/3464 (Gallagher and Sturrock 2015).

### *Previous archaeological investigations*

There are three archaeological sites located within 1 km approximately of the project area. They include two midden deposits, U14/2191, U14/1565, and Ruahihi pa site U14/18 (Table 1). In addition, there are many recorded archaeological sites in the wider area. The Ruahihi pa site was recorded in 1982, and is located on a peninsular plateau off the Oropi Road ridge between Waiorohi Stream to the west and a tributary to the north. Some of the site has been destroyed but significant features remain intact, including two double ditches and bank with terraced area, along with a low ditch to the northwest and terraces, pits, rua and midden.

### **Methodology**

Archaeological monitoring of the site was undertaken by Peter Holmes of CFG Heritage from 15 December 2016 to 20 February 2017. The earth was stripped with a hydraulic digger and works ceased while investigation and recording of any archaeological features occurred. Features were hand excavated where exposed during trenching, then photographed and recorded following standard archaeological recording procedure. A Garmin etrex 30 handheld GPS, with a reported accuracy of  $\pm 5$  m, was used to record the location of points of interest. All spatial information was uploaded to the project GIS. Bulk samples of each exposed midden deposit were taken for analysis.

## Archaeology

Four archaeological deposits were exposed during earthworks, one single midden at the north tip of the property labelled Feature 1, and three smaller middens clustered within 3 m each other at the north-east part of the property (Figure 2). There were no additional features discovered during the earthworks.

### Feature 1

This midden was located on the edge of former earthworks for the original reservoir (Figure 3). The deposit was exposed after topsoil stripping, and covered an area of 4.5 m x 3.8 m, running 300 mm deep. The midden was most dense at the centre and very sparse toward the edges, probably due to previous unrecorded site damage (Figure 4). The northern portion of the deposit was visibly truncated from earlier unrecorded earthworks. The fill of the midden included fire-cracked rock, shell and charcoal. A bulk sample was taken for post-excavation analysis.

### Features 2A, 2B and 2C

Features 2A is a midden filled fire scoop, Features 2B and 2C are fire scoops with minor inclusions of shell but mainly charcoal and sparse fire cracked rock. These deposits were all exposed in a cluster, no further than 3 m apart from each other.

2. The location of the four deposits at 543 Joyce Road.





3 (above left). Feature 1 before investigation.  
4 (above right). Feature 1 before investigation.  
5 (left). Feature 2A before investigation.

Feature 2A was 600 x 580 x 100 mm, Feature 2B was 100 x 120 x 60 mm, and Feature 2C was 100 x 90 x 40 mm. After hand excavation, it was observed that Feature 2C was heavily disturbed. Samples for analysis were taken from Features 2A and 2B.

### Midden analysis

A bulk sample from Feature 1 was analysed; the results are summarised in Table 1. Bulk samples from Features 2A and 2B were small, the fauna was identified and charcoal analysed, but the samples were not an appropriate size for metric analysis. No samples from Feature 2C were taken due to its disturbance. The midden was washed and analysed using conventional methods, with species identification based on Morley (2006).

Table 1 provides the weight of the sample from Feature 1 dried before sieving, and the weight after the shell was washed and dried. In disturbed and secondary deposits, up to 90% of a deposit can include additional sediment and rock (e.g., Campbell 2008). In this feature 76.4% of the weight was lost by sieving. This indicates the shell midden was probably in a secondary context, which is also supported by the high percentage of unidentifiable shell fragments (1343 g total, 986 g is unidentifiable shell residue = 73% of total sample weight), often caused from disturbance.

Table 1 shows the midden in Feature 1 was dominated by pipi (*Paphies australis*) both in NISP and weight. Most of the rest of the shell in the deposit were

soft shore harbour or estuarine species caught at mid or low tide. These are likely to be bycatch during pipi collecting from the nearby Tauranga Harbour, approximately 8 km away. Additionally, Tuangi cockle (*Austrovenus stutchburyi*) valves were small compared to the consistently larger pipi shells, supporting the likelihood these were bycatch. Also present in the sample are some rocky and sandy shore species but at much lower proportions. These are three Tuatua (*Paphies subtriangulata*) from the sandy shore line, and 2 rocky shore species (*Mytilidae* (sp) and *Maoricrypta monoxyla*). While the sample suggests people were undoubtedly gathering shellfish in these other environments, they were not doing so at the same intensity as they were gathering shellfish within the Tauranga Harbour.

Features 2A and 2B only contained a small amount of Pipi (*Paphies australis*) in each. There is more shell residue than diagnostic shell portions in both samples, indicating they are probably also disturbed deposits. The sample sizes of 2A and 2B are too small to qualify for a detailed analysis (Somerville *et. al.* 2017:219; Campbell 2017), so can simply provide an indication that people consumed harbour-caught shellfish in small quantities. Feature 2A and 2B are probably contemporaneous, based on their proximity, size, and results.

| Feature | Species                        | NISP | Weight (g) | Environment      | Tidal depth     |
|---------|--------------------------------|------|------------|------------------|-----------------|
| 1       | <i>Austrovenus stutchburyi</i> | 149  | 40         | Soft shore       | Mid to low tide |
|         | <i>Paphies australis</i>       | 196  | 293        | Soft/sandy shore | Mid to low tide |
|         | <i>Maoricrypta monoxyla</i>    | 1    | <1         | Rocky shore      | Mid to low tide |
|         | Mytilidae sp.                  | 1    | <1         | Rocky shore      | Varies          |
|         | <i>Paphies subtriangulata</i>  | 3    | 5          | Sandy shore      | Low             |
|         | Residue                        |      |            | 986              |                 |
| 2A      | <i>Paphies australis</i>       | 6    | 14         | Soft/sandy shore | Mid to low tide |
|         | Residue                        |      | 76         |                  |                 |
| 2B      | <i>Paphies australis</i>       | 14   | 16         | Soft/sandy shore | Mid to low tide |
|         | Residue                        |      | 17         |                  |                 |

Table 1. Summary of shellfish species identified. Environment and tidal depth data are from Morley (2006) and Powell (1961).

### Fish

Fishbone was analysed following the methodology outlined in Campbell (2016). Only one bone was identifiable, from Feature 1: a burnt thoracic vertebra of a gurnard (*Chelidonichthys kumu*). Gurnard are a demersal species favouring a clear and open bottom floor at depths from the coastline to 200 m (Leach 2006: 46).

### Charcoal analysis

The charcoal samples submitted from the features were too few and small to give an indication of the local vegetation (Appendix 1). One coprosma sample from Feature 1 was used for dating.

### Chronology

A sample of coprosma charcoal and pipi from Feature 1 were submitted to the Radiocarbon Dating Laboratory at the University of Waikato for dating (Table 2).

| Lab No.  | CRA BP   | cal AD 68% | cal AD 95% |
|----------|----------|------------|------------|
| Wk 46088 | 450 ± 16 | 1448–1477  | 1444–1496  |
| Wk 46087 | 771 ± 24 | 1472–1587  | 1454–1647  |

Table 2. Radiocarbon dates from Feature 1.

The dates fit within the first half of the AD 1450–1650 date range often found at Tauranga inland valley sites (discussed further below).

## Discussion and conclusion

The investigation has shown that around the middle 15th and possibly into the late 16th centuries people were collecting shellfish and fishing around Tauranga and moving them inland for consumption.

Several archaeological investigations in the inland valleys of Tauranga have shown that this area was occupied from around AD 1450 to 1650 (Cable 2011, Campbell 2004, 2005, 2008; Campbell and Harris 2007, 2012; Campbell and Hudson 2008; Campbell and Holmes 2013, Frederickson et al 1995; Furey 2004, 2008; Moore 2005; Trilford and Holmes 2017). This investigation at new site U14/3524 fits the first half of the date range. Unfortunately, there were no charcoal samples large enough to contribute to the understanding of floral species and possible bush clearance for horticulture. The results fit the model of inland expansion to Tauranga valleys around the early-middle period of Maori occupation, after earlier coastal occupation.

Compared to the nearby sites in the area that have been investigated to date, U14/3524 is far simpler. Many have intercutting storage pits, postholes and oven scoops indicating intensive occupation over several phases. This site may be an individual cluster of midden, but it is likely the site is larger (although not as complex as those aforementioned) and spanning a wider area than has been identified at this time. It has been noted at the Oropi Downs sites and its surrounding archaeological landscape that there is more intensive occupation at the Waiorohi Stream valley mouth and less intensive occupation further up the valley (Campbell and Hudson 2008:22). For example, Cheyne Road sites (U14/1920 and U14/3193) show numerous intercutting pits, overlain by later phase oven scoops (Furey 2004). These sites are of the same 200-year period as mentioned earlier, as people moved or expanded inland. In neighbouring Ohauiti Valley excavations have revealed extensive sites at the valley mouth, such as U14/3218 and U14/3235 which had houses and several phases of occupation (Campbell 2004, 2005; Campbell and Harris 2007). Although the true extent U14/3254 is unknown and the site lies at the upper platform above the Waiorohi Stream valley, the results otherwise fit this proposed distribution model – the site lies inland up the valley and sites further toward the valley mouth are more intensive. Any further investigation of the surrounding area to U14/3254 can further test this theory.

Midden are often (but not always) visible markers for a wider archaeological site with associated features. If other features are present they are likely to be additional midden, storage pits, fire scoops, and post holes or other evidence of semi-permanent or permanent occupation. The midden matches the faunal results of most nearby sites, indicating an intentional harvest of bivalves from the Tauranga Harbour with less frequent rocky shore species, smaller amounts of fish, at some time between the mid 1400 to late 1500s. The true extent of new site U14/3524 is not known and cannot be confirmed without additional archaeological investigation.

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## APPENDIX 1 CHARCOAL IDENTIFICATION

|                     | Species    | No. pieces |
|---------------------|------------|------------|
| Feature 1           | Coprosma   | 1          |
|                     | Pohutukawa | 1          |
|                     | Puriri     | 2          |
|                     | Kahikatea  | 2          |
| Feature 2A Sample 3 | Matai      | 8          |
|                     | Tanekaha   | 3          |
| Feature 2A Sample 4 | Coprosma   | 1          |
|                     | Puriri     | 1          |
| Feature 2B          | Puriri     | 3          |

### Discussion

These samples are too few and small to give much indication of the local vegetation.



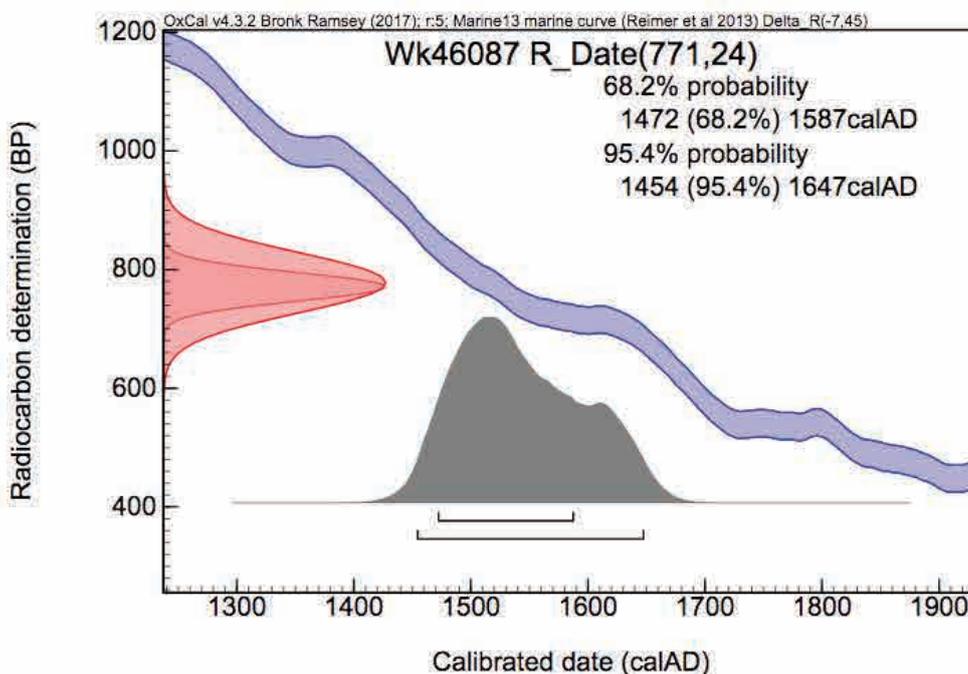
## Radiocarbon Dating Laboratory

### Report on Radiocarbon Age Determination for Wk- 46087

|                              |  |
|------------------------------|--|
| <b>Submitter</b>             | M Campbell   |
| <b>Submitter's Code</b>      | Joyce Road Feature 1 pipi  |
| <b>Site &amp; Location</b>   | 543 Joyce Road, Pyes Pa, Tauranga.<br>Archaeological site U14/3524., New Zealand         |
| <b>Sample Material</b>       | Paphies australis  |
| <b>Physical Pretreatment</b> | Surfaces cleaned. Washed in an ultrasonic bath. Tested for recrystallization: aragonite. |
| <b>Chemical Pretreatment</b> | Sample acid washed using 2 M dil. HCl for 120 seconds, rinsed and dried.                 |

|                           |   |        |
|---------------------------|---|--------|
| $\delta^{13}\text{C}$     | $2.8 \pm 0.3 \text{ ‰}$                   | (CRDS) |
| $\text{D}^{14}\text{C}$   | $-91.5 \pm 2.7 \text{ ‰}$                 |        |
| $\text{F}^{14}\text{C}\%$ | $90.9 \pm 0.3 \%$                         |        |
| <b>Result</b>             | <b><math>771 \pm 24 \text{ BP}</math></b> |        |

### Comments



- 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,  $\delta^{13}\text{C}$ , is expressed as ‰ wrt PDB and is measured on sample  $\text{CO}_2$ .
- $\text{F}^{14}\text{C}\%$  is also known as *Percent Modern Carbon (pMC)*.

*AC Hogg*



## Radiocarbon Dating Laboratory

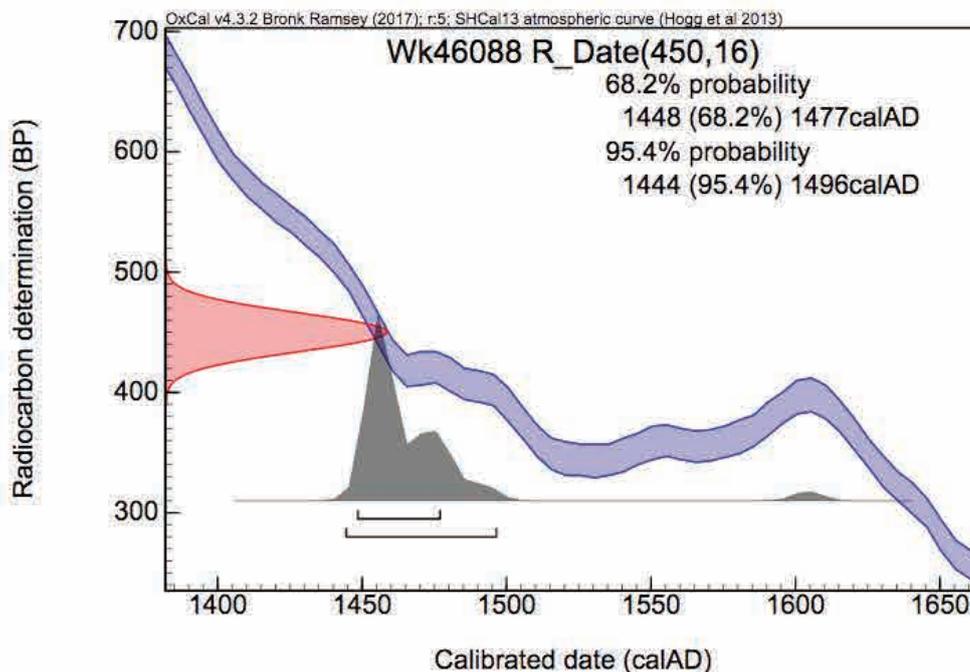
### Report on Radiocarbon Age Determination for Wk- 46088

|                              |   |
|------------------------------|---|
| <b>Submitter</b>             | M Campbell  |
| <b>Submitter's Code</b>      | Joyce Road F1 Charc   |
| <b>Site &amp; Location</b>   | 543 Joyce Road, Pyes Pa, Tauranga.<br>Archaeological site U14/3524., New Zealand  |
| <b>Sample Material</b>       | Coprosma  |
| <b>Physical Pretreatment</b> | Sample cleaned.   |
| <b>Chemical Pretreatment</b> | 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<sup>14</sup>C                -54.5 ± 1.9 ‰  
F<sup>14</sup>C%                94.5 ± 0.2 ‰  
**Result**                **450 ± 16 BP**  
(AMS measurement)

#### Comments

Please note: The Carbon-13 stable isotope value ( $\delta^{13}\text{C}$ ) was measured on prepared graphite using the AMS spectrometer. The radiocarbon date has therefore been corrected for isotopic fractionation. However the AMS-measured  $\delta^{13}\text{C}$  value can differ from the  $\delta^{13}\text{C}$  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,  $\delta^{13}\text{C}$ , is expressed as ‰ wrt PDB and is measured on sample CO<sub>2</sub>.
- F<sup>14</sup>C% is also known as *Percent Modern Carbon (pMC)*.

*AC Hogg*