


Hingaia Wastewater geotechnical investigations: final report (HNZPTA authority 2022/551)

**report to
Heritage New Zealand Pouhere Taonga
and
Watercare Services Ltd**

Ella Ussher

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Ella Ussher

Tonkin and Taylor undertook geotechnical investigations along the proposed route of the Hingaia wastewater line project on behalf of Watercare Services Ltd from 16 to 18 May 2022. An archaeological assessment of effects was conducted by CFG Heritage (Ussher 2022) which determined that, although the earthworks are minimal, three of the boreholes (BH106, BH109A and BH109B) would affect shell midden site (R12/1190) at Bottle Top Bay Reserve (Lot 1 DP 17458) and possible subsurface evidence of pre-European Māori occupation at Kauri Point Reserve (Lot 1 DP 77476). Watercare applied to Heritage New Zealand Pouhere Taonga (HNZPT) for an archaeological authority to complete the works, and authority 2022/551 was granted on 12 April 2022. These works were monitored by Ella Ussher and Hayley Glover of CFG Heritage Ltd.

Background

The geotechnical investigations took place in the suburbs of Wattle Downs and Hingaia.

Pre-European Māori occupation

The Papakura / Hingaia / Drury area and its surrounds were an important location of pre-European Māori settlement, and included access between inland areas and the harbour (Foster 2015). A significant pā at Maketū overlooked the Ararimu Track, the inland route to the Waikato (Clarke 1983) and the Hauraki Gulf which was accessed by an overland route through to present day Clevedon (Tatton 2007). The foothills of the Hunua Ranges were used for extensive cultivation areas and settlement, including the settlement at Ōpaheke. The poorly drained areas of the lowlands would not have been attractive for settlement, but would have been exploited for their birds and other wetland resources (Te Roopu Kaitiaki o Papakura 2010: 7; Tatton 2001: 45).

Historical background

The suburb of Wattle Downs was given its name from the farm that was established on the peninsula in 1884, where a 200-acre grove of wattle trees was planted. Although this venture was, in the long-term, a commercial failure, it gives rise to the name 'Wattle Farm' or later 'Wattle Downs Farm' (Manukau's Journey Auckland Libraries Heritage Collections MJ 0000). The wattle extract was used in the tanning process for leather. The farms were eventually subdivided in the 1970s and developed into a number of intensive residential areas, including Wattle Cove, Acacia Cove and Wattle Park, however Kauri Point was set aside as a recreation reserve in 1975 (DP 77476). The name 'Kauri Point' had been given to the headland by at least 1853, when Captain Drury mapped the Manukau Harbour (Figure 2).

The earliest European land purchases in Hingaia were by George Hart, Adam Chisholm and William Hay. In 1844 Governor Fitzroy had issued a proclamation that



Figure 1. Location of boreholes BH106, BH109A and BH109B and the Hingaia wastewater line route.

allowed Europeans to purchase land directly from Māori owners. In that year, taking advantage of this proclamation, George Hart purchased a large block of land from Ngāti Pari at Papakura on 26 December. Adam Chisholm also bought land at Ōpaheke the next day and William Hay bought another block nearby on 3 March 1845. These purchases were investigated by the Land Claims Commissioners in 1848. Chisholm's claim to 1000 acres at Papakura, actually surveyed as 2193 acres was largely taken by the Crown in exchange for scrip, although he was granted 212 acres at Drury. Hart's and Hay's claims were also taken by the Crown in exchange for scrip. BH109A and BH109B are in a reserve created in 1923 during the subdivision of Allotment 10, on the foreshore of Bottle Top Bay.

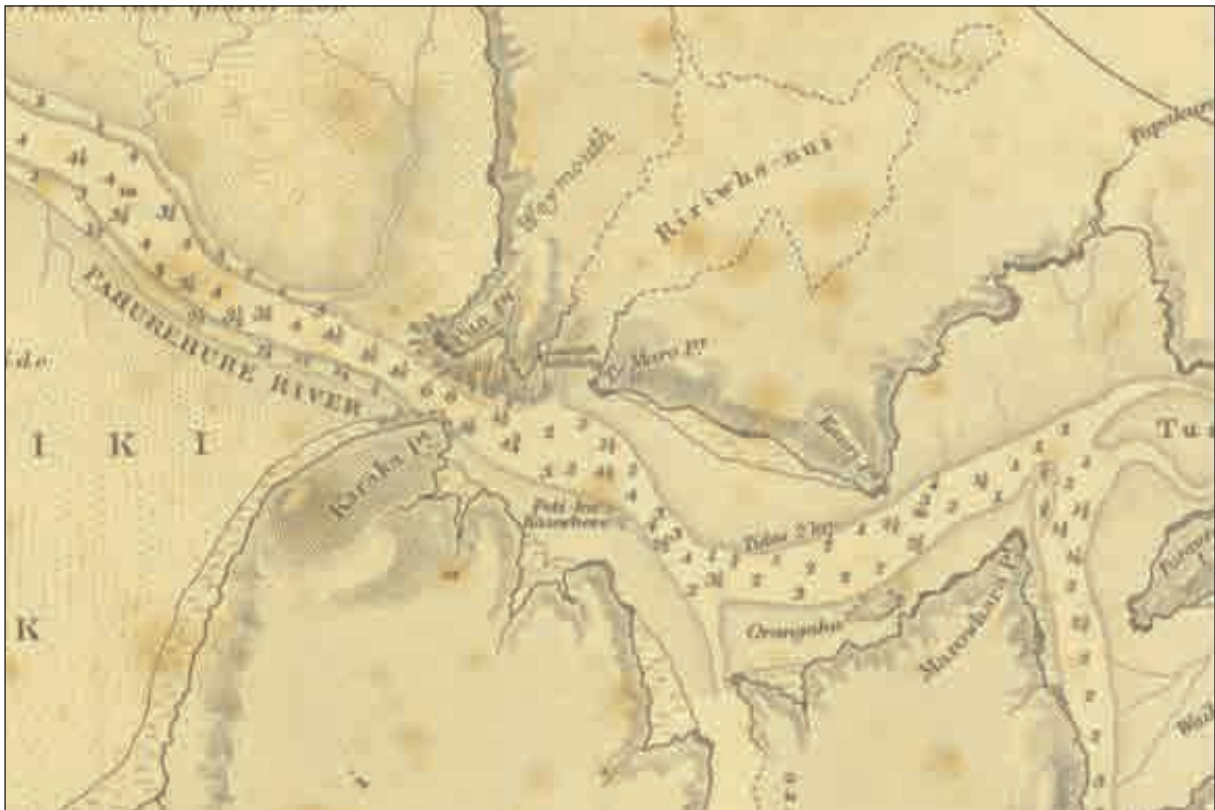


Figure 2. Detail of 1853 map of the Manukau Harbour, surveyed by Commander B. Drury of HMS Pandora (Auckland Libraries Heritage Collections Map 9313).

Previous archaeological work

The first systematic survey of the Wattle Downs area was carried out by Chambers in 1979, for a university assignment. The survey targeted Weymouth and Wattle Downs, which was at that time only beginning to be developed. There is no map of the entire area surveyed, however a number of pit/terrace and shell midden sites were recorded in the vicinity of Kauri Point Reserve and the location of BH106. These include R12/304 and R12/305 within 500 m of reserve. The coastal area of the reserve was surveyed by Foster and Simmons (1980), but it was noted at that time that Wattle Downs was in the midst of being transformed from farms to residential developments, and that any inland features were likely to have been destroyed. The coast was also described as for the most part badly eroded and difficult to access.

Several assessments and investigations have been carried out in Hingaia. At Bottle Top Bay, shell midden sites R12/199 and R12/200 were recorded to the south of the wharf by Foster and Simmons (1980) during their survey of the coastline along the Pahurehure Inlet. Later, R12/681 was recorded by Prince (2000) to the north of the wharf during an assessment for the Hingaia Structure Plan, as well as R12/683 and R12/682 further to the south on the coastal fringe of a property off Hayfield Way by a small inlet, all on the western side of the peninsula, while two shell middens, R12/679 and R12/680, were recorded on properties off Derbyshire Lane on the eastern side. Only a small number of archaeological investigations have been carried out in Hingaia, and only one has been conducted on the coast of the Pahurehure Inlet near Bottlet Tp Bay. Baquié and Clough (2008) monitored works in the Ross Block for the Hingaia Harbourside Estate subdivision, and recorded the destruction of shell midden site R12/914. The midden had already been heavily modified by ploughing and

discing but was noted to be primarily comprised of oyster (*Sacostrea glomerata*), with some tuangi (*Austrovenus stutchburyi*) and mud snail (*Amphibola crenata*) (Baquié and Clough 2008: 6). Several surveys have also been carried out on Pararekau and Kopuahingahinga Islands (Foster 2006, 2017; Campbell 2018) together recording a total of 19 sites, including 13 areas of midden, 2 pit/terrace sites and one gum-digging camp.

Shakles and Phear (2018) monitored topsoil stripping in the vicinity of terrace site R12/1107 for a housing development at 295 Hingaia Road, 1.2k m south of the project area along the Drury Creek. During the works, three distinct clusters of pre-European Māori features were recorded. These included number of postholes, stakeholes, bin pits and a drain in one area, an arrangement of post and board-slots in another probably outlining houses, and a cluster of postholes and stakeholes that may have been the remains of drying racks. Together, these were interpreted as evidence for a settlement in that location that targeted the processing of marine and estuarine resources on the site (Shakles and Phear 2018: 6).

Summary of assessment

A total of twenty locations were visited as part of the initial assessment. Of these, three were determined to be in the vicinity of either recorded or potential archaeological deposits (BH106, BH109A and BH109B).

BH106

Borehole 106 was located in a grassed area of Kauri Point Reserve (Lot 1 DP 77476) in Wattle Downs. No archaeological sites had previously been recorded in the Reserve, despite being a prominent headland at the entrance to the inner Pahurehure Inlet with viewsheds across to Cape Horn / Marowhara Point and Karaka. The location and surrounding area were walked over, and several shallow depressions were noted around 10 m to the west. These were thought to likely be a result of landscaping the reserve, which occurred during the development of Wattle Downs. Aerial images from 1976 show that some movement of soil has occurred in the location of BH106. A spade test pit showed a mixed sandy clay subsoil with small sedimentary rock inclusions below 100 mm of topsoil, to at least a depth of 400 mm. Probing indicated that this subsoil extends at least 10 m in every direction around the proposed location of BH106. Aerial images from 1960, prior to the development of Wattle Downs, indicated that there could possibly have been a defensive ditch that separated the southernmost 60 m of the reserve, suggesting that the headland may have been occupied as a pā however all surface evidence of this has now been destroyed. Subsurface evidence of this is potentially still present the reserve and the location of BH106.

BH109A and BH109B

Two adjacent boreholes were proposed in Bottle Top Bay Reserve (Lot 1 DP 17458) to the east of the boat ramp. The reserve is a flat coastal terrace around 15 m wide and was covered in mown grass. No visible surface archaeological features were noted. Probing indicated that there was a subsurface shell in the location of the boreholes, extending around 5 m to the north and east, with further pockets of shell throughout the reserve (Figure 3). A test pit dug in the borehole location showed a 20 mm thick layer of dispersed and fragmented oyster (*Sacostrea glomerata*) and pipi (*Paphies australis*) shell at 200 mm, below a rich organic topsoil. The layer sat directly above the natural clay subsoil. The midden was subsequently recorded in the SRS as site R12/1190.

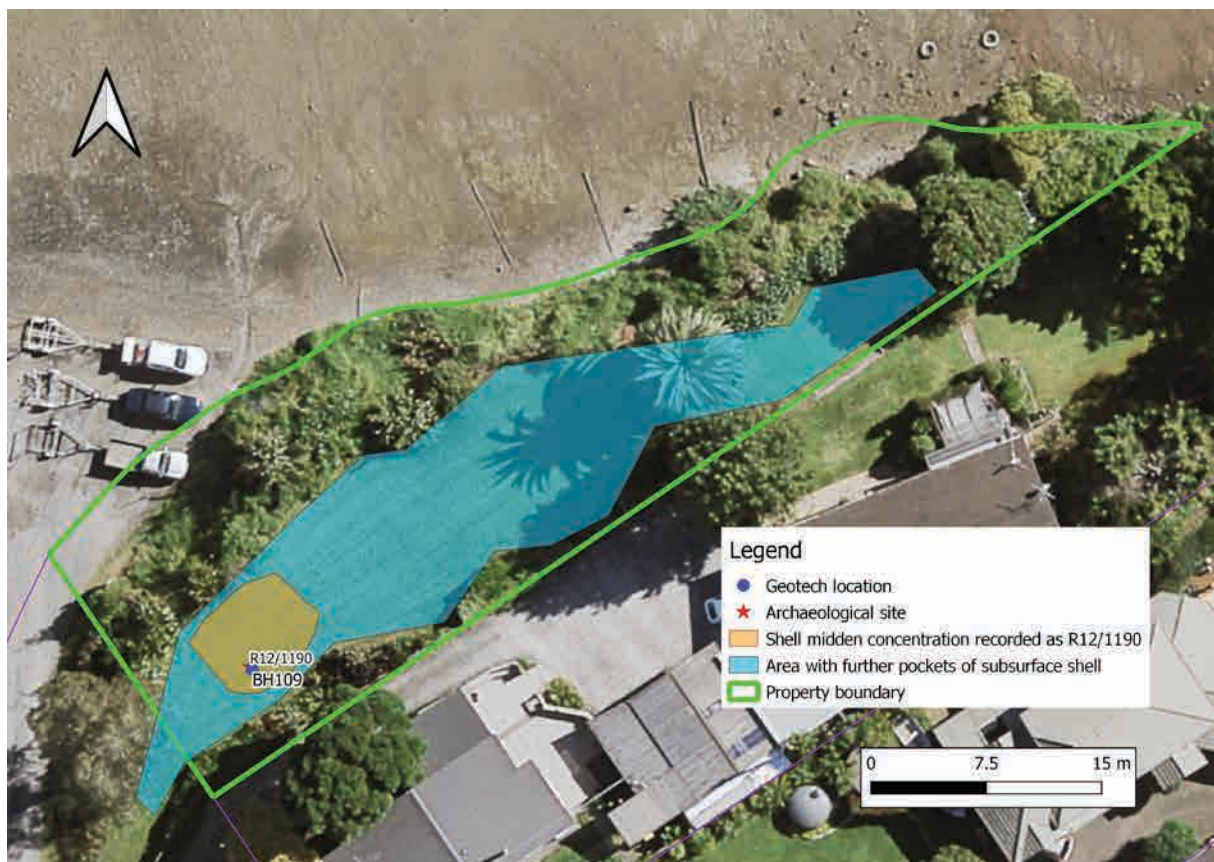


Figure 3. Location of BH109A and BH109B and the extent of midde detected by probing.

Investigation methodology

Each of the boreholes were hand augered to a diameter of 100 mm for the first 1.5–2 m below the surface. The auger collected material from 100 mm depths at a time, which was brought to the surface for inspection, photography and sample collection. To reduce contamination, the material was placed on a plastic sheet. Updated GPS co-ordinates of each borehole location were also collected.

Results

During augering of BH106 in Kauri Point Reserve it was noted that a significant amount of fill was present. This is likely from the residential development of the suburb of Wattle Downs. This mixed clay fill was noted to a depth of around 1.7 m above a sterile clay subsoil. No archaeological features or deposits were noted in BH106.

In BH109A at Bottle Top Bay, dispersed shell and friable bone fragments were noted between 50–100 mm below the surface. Below this was a denser layer of fragmented and whole shell to 300 mm below the surface (Figure 4). This layer sat directly above a sterile yellow clay subsoil. BH109B was augered 1.2 m to the northeast of BH109A. A thinner lens of shell and charcoal was noted from 150–300 mm below the surface (Figure 5). This also sat directly above a sterile yellow clay subsoil. Probing indicated that these were both within the same area of midden originally recorded as site R12/1190 (Figure 6). Two small samples from each borehole were collected at different depths.



Figure 4. Shell midden from site R12/1190 recorded and sampled in BH109A.



Figure 5. Shell midden from site R12/1190 recorded and sampled in BH109B.



Figure 6. BH109A and BH109B in Bottle Top Bay Reserve .

Analysis

The midden samples were wet sieved through a 6.0 mm screen and separated into class for specialist analysis, in this case shell and charcoal, with no bone or stone recovered.

Shell midden analysis

Shell was analysed by Tamara Craigen of CFG Heritage with species identification based on Morley (2004). Shell that did not have any diagnostic portions was classed as residue. The results are summarised in Table 1.

There was very low species diversity present, although samples are small. In BH109, three species were present: tuangi (*Austrovenus stutchburyi*), tio reperepe (oyster, *Saccostrea glomerata*), and tītiko/ (mudsnail, *Amphibola crenata*). Only rock oyster and mudsnail were present in BH109B. These are all intertidal soft shore or rocky shore species that would have been easily accessible in the nearby Pahurehure Inlet near the mouth of Drury Creek.

A comparison of diagnostic shell to undiagnostic fragments by weight shows that most of the shell was crushed and fragmented beyond identification (Figure 7). This is likely the result of post-depositional processes such as trampling or redeposition.

Table 1. Shell identified from R12/1190, by MNI.

Species	BH109A	BH109B
Titiko (mudsnail, <i>Amphibola crenata</i>)	7	1
Tuangi (<i>Austrovenus stutchburyi</i>)	3	
Tio reperepe (oyster, <i>Saccostrea glomerata</i>)	12	9

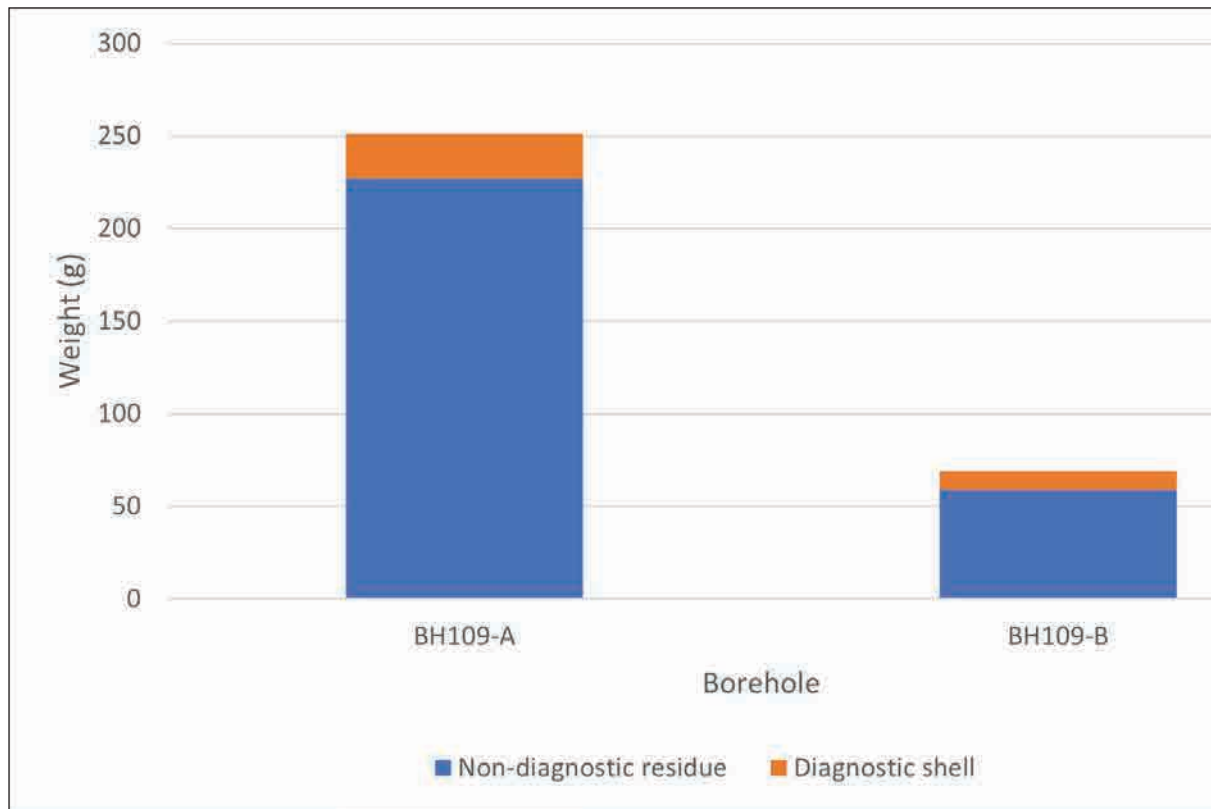


Figure 7. Comparison of diagnostic to non-diagnostic components of shell midden from R12/1190.

Charcoal analysis

Charcoal was analysed by Ella Ussher of CFG Heritage following the methodology outlined in Chabal et al. (1999), Théry-Parisot et al. (2010) and Dotte-Sarout et al. (2015), although the sample sizes were much lower than recommended (200–400 fragments). The results are summarised in Table 2.

There was very low species diversity present, although samples are small. Firewood selection was targeting mostly easy burning shrubs or small trees such as manuka and hebe, supplemented by some larger trees such as conifers that may have been from extant stands of primary forest in the surrounding area or alternatively driftwood collected from the beach at Bottle Top Bay. It is most likely that these represent an environment of secondary growth after initial forest clearance.

Table 2. Summary of identified charcoal from R12/1190

Species	Type	BH109A	BH109B	Total	%
Manuka (<i>Leptospermum scoparium</i>)	Small trees and shrubs	7	1	9	60
Hebe (<i>Hebe</i> sp.)		1			
Conifer (<i>Podocarpus</i> sp.)	Conifer		3	3	20
Unidentified		2	1	3	20
Total		10	5	15	

Radiocarbon dating

A sample of manuka charcoal from BH109A was sent to the Radiocarbon Laboratory at the University of Waikato for Accelerator Mass Spectrometry (AMS) dating. The returned date range for this sample was surprisingly early in the early 14th to early 15th centuries AD (Table 3). The sample was very small, and only a very small area of the site was exposed by the geotechnical investigation, and this raises the possibility that the area of the midden sampled was disturbed and may have included old charcoal in it. This question will potentially be answered by later investigation of the site during proposed earthworks for the construction of the Hingaia Wastewater line.

Table 3. Summary of radiocarbon date from R12/1190

Lab no.	CRA BP	Cal AD 68%	Cal AD 95%
Wk 55030	624 ± 20	1320–1350 (44.4%) 1390–1410 (23.9%)	1310–1360 (58.5%) 1380–1420 (36.9%)

Discussion and conclusion

There have been few archaeological investigations near the mouth of Drury Creek at Bottle Top Bay, and therefore it is very difficult to interpret the data collected from site R12/1190 in a wider spatial and chronological context. However, the number of recorded shell middens (29) pit / terrace sites (2) and settlement / midden sites (1) in Bottle Top Bay between Cape Horn / Marowhara Point and Pararekau Island point to a relatively intensive coastal occupation. Bottle Top Bay Reserve is located on a peninsula overlooking this sheltered tidal bay. Settlement on this peninsula would therefore have provided a strategic location from which to monitor the access inland up the Drury Creek.

The two locations monitored as part of geotechnical investigations for the Hingaia Wastewater project resulted in the collection and recording of archaeological material connected with shell midden site R12/1190 at Bottle Top Bay. Analysis of the midden showed that inter-tidal or rocky shore species such as tuangi, tio reperepe and tītiko were harvested from the nearby Pahurehure Inlet. These species also match those found in other middens in the surrounding area (e.g., Baquié and Clough 2008). Charcoal also showed that firewood selection was targeting mostly easy burning shrubs or small trees such as manuka and hebe, supplemented by some larger trees such as conifers that may have been from extant stands of primary forest in the surrounding area or alternatively driftwood collected from the beach at Bottle Top Bay. The date range of early 14th to early 15th centuries AD was unexpectedly early, although this may be due to site disturbance.

Monitoring at Kauri Point Reserve concluded that any archaeological features or deposits that once remained in that area of the reserve have been destroyed by landscape modification during the residential development of Wattle Downs.

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Radiocarbon Dating Laboratory

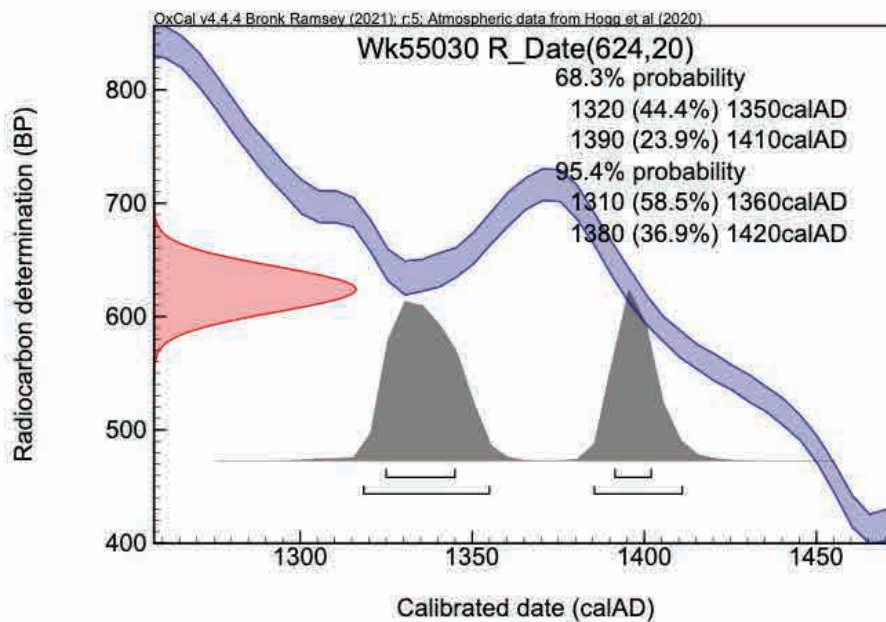
Report on Radiocarbon Age Determination for Wk- 55030

Submitter	M Campbell
Submitter's Code	R12/1190 BH109A Sample 1 Hingaia Geotech
Site & Location	Bottletop Bay Reserve, Oakland Road,
Sample Material	Manuka
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.

D¹⁴C -74.8 ± 2.3 ‰
F¹⁴C% 92.5 ± 0.2 ‰
Result **624 ± 20 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 CO₂.
- F¹⁴C% is also known as *Percent Modern Carbon (pMC)*.

M. Campbell