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# ARCHAEOLOGICAL INVESTIGATIONS AT TIMBERLY ROAD, MANGERE

## **Final Report**

By Glen Farley (MA Hons) with Zarah Burnett (MA Hons) Jen Low (MA Hons) Joe Mills (MA) Andrew McAlister (PhD) Rod Wallace (PhD) Report prepared for Auckland International Airport Ltd

> Auckland Airport

Under Heritage NZ Authority No. 2014/573

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In Fulfilment of NZHPT Authority No. 2014/573

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#### **INTRODUCTION**

**Project** A business park subdivision has recently been under development at the eastern end of Timberly Road, Mangere (Figure 1–Figure 2). This subdivision will result in the formation of 12 allotments, with access roads. The subject property consists of two legal titles: Lot 1 DP 461285 (a large southern block of c.17.4ha) and Lot 29 DP 423042 to the north (totalling some 21ha). The property is bounded to the north and west by an existing business park development, with Timberly Road providing access from the northwest. To the east lies Pukaki Creek, while to the south and southwest lies Tautauroa Creek. The property was in pasture, having previously been farmed.

> An archaeological assessment (Farley and Clough 2012) was commissioned by Alastair Kent-Johnston of Harrison Grierson on behalf of Auckland International Airport Ltd (AIAL) to establish whether the proposed subdivision was likely to impact on archaeological values. This established that there were five recorded archaeological sites within the property: R11/1359 (midden), R11/1360 (possible terrace), R11/1361 (depression), R11/2378 (midden) and R11/2379 (midden) (Figure 3). Two of these (R11/1360 and R11/1361) were unable to be relocated, while the known extents of the remaining sites were situated within the coastal esplanade reserve. It was noted that there was potential for the survival of subsurface remains relating to pre-European Maori occupation based on the presence of these recorded sites. Any such remains would have some archaeological value and could provide information relating to the history of the property and wider area. Furthermore, the removal of weed species and replanting within the esplanade reserve would be likely to have some minor impact upon those recorded sites.

> An archaeological Authority for the work was applied for and granted by the NZ Historic Places Trust (now Heritage New Zealand Pouhere Taonga (Heritage NZ) on 19 December 2013 (Authority No. 2014/573). The authority was conditional on archaeological monitoring of any earthworks that might affect archaeological sites and the investigation and recording of any remains in accordance with an archaeological management plan (Farley and Clough 2013).

The investigations took place in February 2014, with ongoing monitoring of general re-vegetation works undertaken in May 2014. Two of the previously recorded sites (R11/2378 and R11/2379) were investigated, as were five additional sites exposed during earthworks.

This is the final report on the archaeological work carried out in accordance with Condition 12 of the Authority. An interim report has previously been submitted (Farley and Clough 2014a).

The following sites were investigated (Figure 4): Methodology R11/2379 (midden, structures, pits) R11/2378 (midden) R11/2952 (midden) R11/2953 (midden) R11/2954 (midden) R11/2955 (midden, stake holes and firescoop) R11/2956 (timber structure) The archaeological work was directed by the archaeological management plan (Farley and Clough 2013). Monitoring of the construction work took place from the initial set up phases onwards, and included the formation of silt fencing, silt ponds, general topsoil stripping and re-vegetation works. During the works to establish silt fences around the site several areas of shell deposits were identified. These included two previously unrecorded sites (R11/2952 and R11/2953), and extensions to the existing sites R11/2378 and R11/2379. During the stripping of topsoil through the northern gully some 19th century material was exposed, and a timber structure (R11/2956). Two further midden deposits were identified during the general topsoil stripping phase (R11/2954 and R11/2955). The excavation work relating to the silt fencing and silt ponds, and works in close proximity to known archaeological sites and gully modification, involved the removal of the overlying turf by mechanical excavator equipped with a weed bucket. Motor scrapers and bulldozers were utilised across the main bulk excavation areas. Monitoring of the excavation work was undertaken by Glen Farley, Jen Low, Elinor Sturrock and Joss Piper-Jarrett while Bernie Larsen assisted with the monitoring of the re-vegetation program. The sites were surveyed using a high-resolution GPS system. Appropriate plan and section drawings were made to accompany this. Bulk 10L midden samples were collected from all of the exposed deposits. Once the shell material was adequately recorded this material was removed with a weed bucket and the subsoil examined for any further archaeological features. R11/2379 proved to be a more complex site than the midden initially recorded. Excavation revealed over 200 features, from which multiple samples (soil,

shell, charcoal, rock) were collected. A total of 26 worked stone artefacts were identified and collected from this site, with 10 from R11/2955 and one from R11/2953. Individual features were mapped using the same high-resolution GPS system.

The 19th century artefact material was analysed by Jen Low; the midden samples by Glen Farley, Laura Dawson and Bernie Larsen; the Maori artefacts by Joe Mills; the lithic sourcing analysis was by Joe and Andrew McAlister; the charcoal analysis by Rod Wallace; and the radiocarbon dating was provided by the University of Waikato Radiocarbon Dating Laboratory.



Figure 1. General location map with Timberly Road area indicated (source: Auckland Council GIS Viewer)



Figure 2. Aerial view of area around the subject property (highlighted) with underground services displayed (source: Auckland Council GIS Viewer)

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#### HISTORICAL BACKGROUND

Maori

**Occupation**<sup>1</sup>

Situated along the eastern shoreline of the Manukau Harbour, and bordering Mangere, the area of Ihumatao has a long and established history of Maori occupation. Rich volcanic soils suitable for cultivation, extensive marine resources and fresh water supplies made the peninsula a highly desirable location for settlement. Inlets such as the Oruarangi and Pukaki Creeks gave access to inland areas and the nearby portage at Otahuhu (Te To-waka) provided a route across to the Waitemata Harbour.

The landscape of the Ihumatao area is dominated by its former and existing volcanic cones; the formation of which is associated with the Maori deity Mataaoho, and the tradition of 'Te Riri a Mataaoho' (the wrath of Mataaoho). Many geographic features recall these origins including: Te Pane a Mataaoho (the head of Mataaoho), known as Mangere Mountain; and Te Ihu a Mataaoho (the nose of Mataaoho), an early name for the westernmost point of Ihumatao including Maungataketake (Ellett's Mountain). These craters, together with those of the wider Mangere-Otahuhu area are known collectively as Nga Tapuwae a Mataaoho (the footprints of Mataaoho) (Figure 5 and Figure 6).<sup>2</sup>

Many different iwi and hapu have featured in the history of the Manukau area; however, the first inhabitants of the land were said to be the Turehu ('who arose from the land'). Another of Nga Tupuna Tuatahi ('the first ancestors') associated with the Manukau was the early navigator and explorer Toi Te Huatahi whose descendants, Tini o Toi ('the multitudes of Toi') are connected with the early occupation of Puketutu Island and the adjoining mainland.

In the mid-14th century the Tainui waka arrived on the shores of the Manukau. While journeying down the harbour one of the crew members, Taikehu, went ashore to survey the district and he named his landing place 'Nga Hau Mangere', after the 'gentle breezes', from which the Mangere area takes its name. When the Tainui waka continued its journey south (eventually stopping at Kawhia in the Waikato) several members of the group remained in the Mangere area, including the tohunga (spiritual leader) Rakataura, and a rangatira known as Poutukeka.

<sup>&</sup>lt;sup>1</sup> Note: the Maori Occupation, The Otuataua Stonefields, The Ihuamatao Mission Station and the European Purchase and Settlement Sections have largely been extracted from the following: Graham Murdoch. 2011. ENV-2010-304-000004 – Manukau City Council (proponent) – Proposed Plan Change 13 to the ARPS (Extension to the Metropolitan Urban Limits at the Mangere Gateway Heritage Area). Evidence to the Environment Court; and E. Harris. 2014. Heritage and History of the Ihumātao Mangere Area. Historic research undertaken for Clough and Associates Ltd. <sup>2</sup> Volcanic craters within the wider area include: Mangere Lagoon, Waitomokia (Mt Gabriel), Kohuora (Kohuora Park), Nga Kapua Kohuora (Crater Hill), Te Tapuwae a Mataaoho (Mt Robertson/Sturges Park) and Te Pukakitapu o Poutūkeka (Pukaki Crater).

Maori

Occupation,

continued

The descendants of the Tainui crew members became part of the iwi known as Nga Oho; however, they eventually developed their own tribal identities over time. Descendants of Rakataura became known as Ngai Riukiuta, and predominantly occupied the Tamaki Isthmus. The descendants of rangatira Poutukeka remained in the Manukau area and were known as Ngati Poutukeka ('the tribe of Poutukeka').

In the 1600s Ngati Poutukeka adopted the name Waiohua to commemorate the death of Huakaiwaka, the paramount chief who dominated the Auckland region at the time. Te Waiohua controlled much of Auckland from 1690 to 1750; however, from the mid to late 1700s conflict with Ngati Whatua severely impacted the tribe. Many members of Te Waiohua fled the Tamaki region but Ngati Whatua (Te Taou) were not numerous enough to pose a threat to the outlying Ihumatao, and the settlement not only survived but became stronger due to an influx of refugees searching for shelter. Eventually the Ngati Whatua (Te Taou) who remained in the area and Te Waiohua agreed upon a truce and cemented this through strategic intermarriage and peace agreements.

Further warfare occurred in the early 18th century following raids by musketarmed Ngapuhi war parties from the north. Traditionally armed tribes throughout the Auckland Isthmus suffered heavy losses and survivors fled south to the Waikato. By the early 1830s, Te Waiohua had recovered their position and reoccupied their kainga (ancestral home) in Mangere. To escape tribal conflict, the people of the Ngati Rori hapu moved from Pehiakura and Awhitu near Waiuku and changed their name to Ngati Te Ahiwaru. In 1846 the Ngati Te Ahiwaru tribe established itself in Ihumatao on land gifted (tuku whenua) by Te Akitai Waiohua. Descendants of Ngati Poutukeka and Te Waiohua, including Te Akitai Waiohua and Ngati Tamaoho, are still closely connected to the Ihumatao papakainga (or ancestral home) today.

The OtuatauaThe Maori settlement at Ihumatao was large, relatively permanent and<br/>successful. Geographically it was close to main trade and travel routes but was<br/>out of the way enough not to be a target and enjoyed long periods of peace,<br/>unlike much of the Auckland region. The Manukau coast provided abundant<br/>seafood and shellfish stocks and the fertile volcanic soil rewarded cultivation.

The Maori impact on the landscape at Ihumatao is evident at the nationally significant Otuataua Stonefields Historic Reserve. This site preserves an archaeological record of the intensive and sophisticated cultivation of the Auckland landscape by Maori. Originally the Auckland isthmus was dominated by stonefield gardens (covering 8,000 hectares of land); however, the 100 hectares at Otuataua is now one of the last examples of the landscape created by this type of cultivation (Clough and Plowman 1996).



Figure 5. Close-up of survey chart, dated 1853, showing the Ihumatao peninsula, with volcanic cones and Pukaki Creek visible (source: Sir George Grey Special Collections, Auckland Libraries, NZ Map 890)

**The Otuataua Stonefields,** *continued* Maori gardeners at Otuataua cleared stones from soil and used them to build structures including low boundary walls and mounds of stone and earth. These mounds were used to incubate crops like kumara. The mounds included modified soil (with shell and organic matter) to provide added heat to crops which had come from warmer tropical Polynesian climates and required care to survive in New Zealand's cooler climate. The wider inhabited and cultivated landscape included volcanic cone pa on Mangere Mountain, associated stonefields at Ambury Farm Park, Puketutu Island, stonefield complexes at Puhinui and around Matukutureia (McLaughlins Mountain), and occupation of Maungataketake (Ellett's Mountain).

> At Matukutureia Pa, a site occupied in the 1500s and 1600s which has since been destroyed by quarrying, there was evidence of stonefield gardens, terraces, walls, mounds, houses, cooking and storage sites (Lawlor 1981; Clough and Turner 1998). The Otuataua Stonefields were in continuous cultivation and settled from the time of Maori arrival through to the 19th century when European settlers arrived in the Ihumatao area (Clough and Plowman 1996).

Continued on next page



Figure 6. Close-up of Dr Ferdinand von Hochstetter's geological map of the Auckland Isthmus, dated 1859, showing the Ihumatao peninsula with volcanic cones and settlements identified (source: Sir George Grey Special Collections, Auckland Libraries, NZ Map 5694b)

The IhumataoSome of the earliest Europeans to explore the Manukau area were Anglican<br/>missionaries. In 1820 Reverends John Butler, Samuel Marsden, William<br/>Puckey and James Shepherd navigated around the coastline; however, conflict<br/>across the Auckland Isthmus prevented any permanent European occupation<br/>until the mid-19th century.

Between 1847 and 1849 the Wesleyan Ihumatao Mission Station was established on three hectares of land at the base of Maungataketake (Ellett's Mountain) (Figure 7).<sup>3</sup> The land was provided by Ngati Te Ahiwaru and they also helped construct the Mission House. Reverend Henry Hassall Lawry (b.1821 d.1906) and Reverend Thomas Buddle (b.1812 d.1883) were in charge. The Mission settlement at Ihumatao focussed on and was supported by local Maori who had a large settlement (of around 100 people) to the north of the Mission, on the coastal flat. Farming was well developed at this nearby settlement and included pasture for grazing horses and cows; fields of wheat and oats; and a threshing mill to process them. During the period of the Mission, Maori were economically dominant in the region, growing large quantities of food for sale to the rapidly expanding Auckland market.

<sup>&</sup>lt;sup>3</sup> The site of the Ihumatatao Mission Station is recorded as CHI No. 4522, and as New Zealand Archaeological Association (NZAA) Site No. R11/545.

The IhumataoThe Mission itself covered 8 acres and consisted of a school/chapel building, a<br/>store house and several outbuildings. Mission Station records show that 17Station,<br/>continuedMaori children were baptised there (between 1848 and 1855) and that at least<br/>27 family groups were resident in Ihumatao. The Ihumatao Mission was<br/>successful, in part, due to its use of 'Native Mission Assistants' – Maori<br/>teachers and missionaries who taught in their own language. All church<br/>services were held in Maori. Buddle had studied the Maori language and from<br/>1844 headed the Wesleyan Native Institution in Auckland, a college devoted to<br/>training Maori teachers, where Lawry also worked. It was also relatively<br/>unique and successful because of the way in which it was integrated into a<br/>Maori settlement.

While in the 1850s the Maori population significantly outnumbered settlers, the mass migration of Maori from the area with the advent of war in 1863 changed this dynamic, resulting in the closure of the Ihumatao Mission Station.



Figure 7. Painting of the Ihumatao Mission Station, dated 1855, by Elizabeth Forsaith (sister-in-law to Reverend Henry Hassall Lawry), showing a three-roomed weather board cottage and surrounding garden, walled-in paddocks and the school (source: Sir George Grey Special Collections, Auckland Libraries, 4-1252)

European Purchase and

Settlement

Following the musket wars of the early 19th century a number of European traders and settlers as well as missionaries began to make contact with the Manukau area and Maori came under increasing pressure to relinquish land. In 1836 the Church Missionary Society catechist, William Fairburn, acquired some 40,000 acres of land in Manukau. The area (comprising most of what is now Manukau City) was known as the 'Fairburn Purchase', and included all of the eastern ancestral land held by Te Waiohua in the district. The Crown purchased large tracts throughout south Auckland from the early 1840s, and private purchasers bought up newly available lots after the Crown right of preemption over Maori land was waived from 1844. European settlement of the Mangere-Puhinui area commenced in the 1850s and early owners included: George Graham, a Sergeant in the 58<sup>th</sup> Regiment, who purchased and developed the Whakarongotukituki area (adjoining the Ihumatao block); and Colonel Marmaduke Nixon, who bought a 469 acre parcel on the eastern side of George Bolt Drive which he named 'Abbeville Farm'.

Despite the early rush for land, ownership of the Ihumatao block was retained by Maori, due in part to its cultural, historical and economic significance. During the 1850s a movement arose which sought to prevent loss of Maori land and to promote unity among tribal groups. In 1858, Potatau Te Wherowhero reluctantly accepted the mantle of Kingship and relocated from Ihumatao (where he had stayed with Ngati Te Ahiwaru) to Ngaruawahia, in the Waikato. Though Potatau Te Wherowhero did not regard his Kingship as an opposition to the sovereignty of Queen Victoria, he was increasingly forced into opposing the Government. Tensions continued to escalate and in the lead-up to the campaign many resident Maori were forced to move south of the Mangatawhiri stream (the recognised boundary of European settlement, at the foot of the Bombay Hills). A local Ihumatao farmer-settler, Stephen Westney reported the event:

'All our Maories [sic.] except about fifteen at Mangere, . . . took the road to the Waikato. Their going was very pathetic, as they had with few exceptions, good relations with their Pakeha neighbours. Nearly all their belongings had to be left – canoes, fishing gear, hundreds of pigs and poultry, and worst of all their land was later confiscated. It was a case of blood being thicker than water.'<sup>4</sup>

Few Maori remained at Ihumatao and soon afterwards war between the Kingites (supporters of the Maori King) and Government forces began as they invaded the Waikato in 1863.

<sup>&</sup>lt;sup>4</sup> Quoted in: Albert E. Tonson, *Old Manukau*, Tonson Publishing House, Auckland, 1966, p.104

**European Purchase and Settlement,** *continued* At the cessation of the Waikato War the Manukau area was largely deserted of its traditional occupants. Ngati Te Ahiwaru, together with the other hapu of the district, went into exile in the Waikato where they remained for a decade. Those possessions left behind at Ihumatao were subsequently looted, and the land confiscated in its entirety. On 16 May 1865 an Order in Council proclaimed the confiscation of most of the remaining Maori land in the Manukau area under the New Zealand Settlements Act 1863. In the Mangere-Puhinui area this included the confiscation of the Mangere Block (486 acres, 196 ha), the Ihumatao Block (1100 acres, 445 ha) and the Pukaki Block (1300 acres, 525 ha). In addition a further 144,288 acres (57,650 ha) was confiscated from the Manukau tribes in the wider district.

The land was surveyed and subdivided into farm blocks suitable for issue by Crown Grant, and the landscape of Ihumatao was subsequently transformed from an area dominated by fern and scrub into a land of small farms and mixed cropping, and later, dairy farms (Figure 8–Figure 10).

Figure 8. Map showing sections and Native land on Manukau Harbour, c.1860s (source: Alexander Turnbull Library, Wellington, New Zealand.<u>http://natli</u> b.govt.nz/records/2 2781826)





Figure 9. Close-up of map, dated 1860s, showing the subdivision of the Mangere-Puhinui area (source: Sir George Grey Special Collections, Auckland Libraries, NZ Map 4450)



Figure 10. Painting of the Manukau area, dated c.1863, by Rt Hon Sir William Fox. Looking down to Manukau Harbour, with a sailing ship at a breakwater on a point of land to the left, small craft at a jetty on the right, a few houses strung along shore with sections laid out in the foreground and a small church to the left. Mangere mountain is in the middle distance with Puketutu Island to the right. The background volcanoes are Ihumatao (source: Ref: WC-011. Alexander Turnbull Library, Wellington, New Zealand)

TimberlyOn 15 October 1852 a Crown Grant for Allotment 75 Parish of Manurewa was<br/>issued to Henry Vercoe, Esq., J.P. (Figure 11).<sup>5</sup> The land comprised a total of<br/>184 acres, 1 rood and 30 perches and was bounded to the north by Allotment<br/>74, to the south and east by the Tautauroa Creek (Pukaki Creek), and to the<br/>west by a roadway (Westney Road).

Henry, his wife Anna, and five of their children (Emeline, Joseph Lawry, Henry Walter, Mary and Martha) arrived in Auckland aboard the clipper *Joseph Fletcher* on 31 August 1852 after a voyage of 99 days from London.<sup>6</sup> Shortly after his arrival Henry made several purchases of land, and in addition to Allotment 75 he also acquired Allotments 64 and 74 in October of 1852.<sup>7</sup>

Vercoe appears to have immediately begun improvements on the land, and by 1854 the property hosted the wedding of his third daughter, Emeline, to Thomas Russell, a prominent Auckland lawyer and businessman (Figure 12).<sup>8</sup> Vercoe and his wife both passed away within a matter of months of each other in 1861-2,<sup>9</sup> which resulted in the sale of the livestock and other implements and then the land.<sup>10</sup> Allotment 75 was divided into two portions which were sold in January 1863, with the smaller section (59 acress and 3 roods) sold to William Westney,<sup>11</sup> while the larger portion (125 acres, of which the project area is a portion) was sold to Robert Hall (Figure 13).<sup>12</sup> Hall held the land for a matter of months before selling to William Nicholls.<sup>13</sup> Nicholls, a blacksmith, farmed the land with both grazing and dairy stock and also planted crops (Figure 14). Nicholls held the land for 18 years before selling to William H. Wyman and George W. Wyman in 1881.<sup>14</sup>

William Wyman sold his share of the property to his brother George the following year.<sup>15</sup> George sold the land to Samuel Howard in 1884.<sup>16</sup> Howard appears to have been unable to meet repayments on the mortgage, which he had acquired from George Wyman, and in 1891 the property was transferred back to Wyman via an Equity of Redemption.<sup>17</sup>

<sup>&</sup>lt;sup>5</sup> Crown Grant 3G/1446, BAJZ A1660 23663 Box 962/a, Archives New Zealand.

<sup>&</sup>lt;sup>6</sup> *New Zealander*, 1 September 1852, p.2.

<sup>&</sup>lt;sup>7</sup>*New Zealander*, 13 October 1852, p.4, Deeds Index A3/405, Archives New Zealand.

<sup>&</sup>lt;sup>8</sup> Daily Southern Cross, 21 July 1854, p.2.

<sup>&</sup>lt;sup>9</sup> BDM 1862/4209 and 1862/4450.

<sup>&</sup>lt;sup>10</sup> Daily Southern Cross, 18 April 1862, p.2, Daily Southern Cross, 13 October 1862, p.2.

<sup>&</sup>lt;sup>11</sup> Deeds Register 13D/559, BAJZ A1660 23641 683/a, Archives New Zealand.

<sup>&</sup>lt;sup>12</sup> Deeds Register 13D/560, BAJZ A1660 23641 683/a, Archives New Zealand.

<sup>&</sup>lt;sup>13</sup> Deeds Register 17D/152, BAJZ A1660 23641 688/a, Archives New Zealand.

<sup>&</sup>lt;sup>14</sup> Deeds Register 32M/857, BAJZ A1660 23641 763/a, Archives New Zealand.

<sup>&</sup>lt;sup>15</sup> Deeds Register D12/705, BAJZ A1660 23641 722/a/2, Archives New Zealand.

<sup>&</sup>lt;sup>16</sup> Deeds Register R12/74, BAJZ A1660 23641 21/a/1, Archives New Zealand.

<sup>&</sup>lt;sup>17</sup> Deeds Register R92/520, BAJZ A1660 23641 141/a, Archives New Zealand.



Figure 11. SO 1340C, entitled 'Plan of a Portion of [Mess]ers Imley and Jacksons Claim Divided into Allotments', dated 1852(?). Allotment 75 is highlighted in red, Westney Road in white (source: QuickMap)

Figure 12. Newspaper notice of the marriage of Thomas Russell and Emeline Vercoe (source: *Daily Southern Cross*, 21 July 1854, p.2)

#### MARRIED.

- On the 18th inst., at St. Paul's Church, Auckland, by the Rev. Edward H. Heywood, of St. John's College, Bishop's Auckland, WYNNE PEYTON, of Wynnestead, East Tamaki, only son of Major JOHN GRAY, (unattached), to AUGUSTA ANNE, youngest daughter of the late Captam ALEXANDER EDWARDS SPICER, of the Madras Army.
- On Tuesday, the 18th July, at Tautauroa, near Otahuhu, by the Rev. Walter Lawry, THOMAS RUSSELL, Esq., Solicitor in this City, to EMPLINE, third daughter of HENRY VERCOE, Esq., J.P.
- On Monday, 17th instant, at St. Paul's Church, CATHERINE, second daughter of Mr. THOS. HANDCOCK, of Victoria-street, Auckland, to Mr. JOHN HIGGINS, Candle Manufacturer, Wyndham-street, Auckland.

Figure 13. Plan of the initial subdivision of Allotment 75 in 1863 (source: Deeds Register 13D/560, BAJZ A1660 23641 683/a, Archives New Zealand)



Timberly Road Property History, *continued*  In 1896 George Wyman conveyed a portion of the original 125 acre block (situated alongside Westney Road) to The General Trust Board of the Diocese of Auckland (Church of England) as 'a site for a church for the celebration of Public Worship...and generally for religious and educational purposes.<sup>18</sup>

In 1909 Wyman conveyed the remaining parcel of land to George Walter Cox,<sup>19</sup> who retained the land until at least 1920 (Figure 15). Figure 15 also indicates that the land was in grass, with either post and wire or hedge and bank fencing. A house and shed are also marked on the property.

<sup>&</sup>lt;sup>18</sup> Deeds Register R98/389, BAJZ A1660 23641 147/a, Archives New Zealand.

<sup>&</sup>lt;sup>19</sup> Deeds Register R171/462, BAJZ A1660 23641 220/a, Archives New Zealand.

Figure 14.

auction of

MONDAY, MAY 19 Advertisement for the sale by UNRESERVED SALE Nicholls' farm stock (source: Auckland Star, 12 OF May 1879, p.4) к т 0 С F м IS A R (The Property of Mr. William Nicholls, is who is leaving his Farm). Co. NOR SALE, on Monday, May 19, at, 11 o'clock, on the farm, at Mangere. The following ;--12 Good Dairy Cows. in milk or at calving 30 head Young Cattle, mixed sexes 2 Powerful Draught Geldings, good workers Draught Mare. in foal, with foal at side A three-year-old Riding Mare Çc, Grey Gelding, good in saddle or harness Γ. Two-year old Colt Yearling Colt and Yearling Filly 5 Fat Pigs Dairy Uten ils Hornsby Plough and Soaith, Harrows. 7. Potatoo Scarifier, Horse, Rake, Chaffcutter Dray, with Hay Frame Spring cartand Harness Cart and Plough Harness 3 tons Seed Potatoes 1.4 Sundry Articles of Household Furniture. comprising-Dining Table and Chairs, Set of Parloar Furniture, Bedstead 52 and Sundries. ALFRED BUCKLAND.



Figure 15. DP 13909, entitled 'Plan of part of Allotment 75, Parish of Manurewa', dated 1920 showing a house and shed (circled in red) on the property (source: QuickMap)

Timberly Road Property History, *continued*  The property boundaries appear to have remained the same until 1998, when the land was re-surveyed and then subdivided as part of the business park development (Figure 16–Figure 18).

An examination of historical aerial photographs revealed that the farm house and its ancillary buildings remained in place from 1920 (Figure 15), through to 1959 (Figure 19), until major earthworks took place across the majority of the old farm in 2005 (Figure 20). The farm buildings were situated in an area of land that is now included within Lot 29 DP 423042 (the smaller northern block). These structures appear to have been either demolished or removed as part of the 2005 developments. The wastewater services that cross the property (as indicated in Figure 2) are likely to have been installed at that time.



Continued on next page

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Figure 16. DP 188195, entitled 'Plan of Lot 1 for CT diagram purposes', dated 1998 (source: QuickMap)

Figure 17. SO 69355, dated 1998 (source: QuickMap)









Figure 19. 1959 aerial photograph of the subject property showing the house and shed (source: Auckland Council GIS Viewer)

Continued on next page



Figure 20. 2005 aerial photograph of the subject property. Note the extent of earthworks, and the modern road alignments (source: Google Earth 2012)
#### **INVESTIGATION RESULTS**

**Overview** Additional remains representing the extension of two midden sites previously recording in the coastal buffer area (R11/2378 and R11/2379) and five new archaeological sites (R11/2952-2956) were located as a result of works within the project area at Timberly Road (Figure 4). Most of the sites relate to pre-European Maori activity in the area and consisted of midden, structures, pits, stake holes and a firescoop. There was one timber structure (R11/2956), thought to be of late 19th century or early 20th century origin. The sites were investigated in accordance with Authority No. 2014/573. Site R11/2379 proved to be a settlement site extending over a much larger area than the original midden exposure had indicated.

Monitoring and investigations followed the research aims, methodology, recording and sampling techniques set out in the archaeological management plan (Farley and Clough 2013). Recording of the archaeological sites involved the creation of both plan and section drawings. In addition, the individual contexts were recorded using the single context recording system (see Appendix D for context lists).

A minimum of one 10L bulk midden sample was collected from each modified midden site, apart from R11/2954, which was too damaged. A total of 12 samples (120L) of shell material were collected from the five remaining within the Timberly Road development (Table 1).

A total of 11 charcoal samples were collected, all from site R11/2379. Additional charcoal material was also extracted from the bulk midden samples.

A single bulk rock sample was collected. This came from site R11/2379. Further bulk soil or context samples were collected from a range of additional features, such as pits and fire scoops.

A total of 36 items identified as Maori artefacts were recovered in the field, while a further flake was identified during midden analysis. These items have undergone technological and sourcing analysis.

A total of 72 items identified as historic period European artefacts were recovered in the field. These have also been analysed.

NZAA Site	Bulk Shell Sample	Bulk Charcoal Sample	Bulk Rock Sample
R11/2378	2	0	0
R11/2379	5	11	1
R11/2952	1	0	0
R11/2953	1	0	0
R11/2954	0	0	0
R11/2955	3	0	0

Table 1. Midden samples collected from each of the sites situated within the Timberly Road development

Site R11/2378 The extension to this site was initially exposed during works to install a silt fence, and was then fenced off temporarily until recording of the site was completed. This site was excavated on 10 February 2014. The turf and topsoil were stripped, the shell extent recorded and sampled, and the area then stripped to the subsoil.

This site is an extension to site R11/2378, being situated inland from the main part of the deposit. It is thought likely that the majority of material had been spread into this area by ploughing and other farming activities. The extension recorded measured up to 9m EW by 6m NS, but clearly extended further to the south beyond the silt fence, linking up with the main recorded body of midden. Once the site extent was exposed a 1m<sup>2</sup> test pit was excavated (Figure 21 and Figure 22). It was found that the site was generally just 20mm thick, although in places it was up to 100mm thick, particularly along the southern baulk (Figure 23 and Figure 24). This deposit was noted to be generally composed of cockle and pipi shells. No additional features or artefacts were identified.

All of the exposed area of shell was removed during works, although this only represents a small portion of this site. Approximately 90% of the site remains intact. A plan of the sites of the southern area, including R11/2378 is presented in Figure 25. A GIS plan of the excavated extent of R11/2378 and an estimated extent of the midden protected in the esplanade reserve is shown in Figure 26.

No artefacts were recovered from this site and one bulk midden sample was analysed.



Figure 21. View facing northwest showing the extent of R11/2378 extension



Figure 22. View showing a test pit excavated within R11/2378 extension



Figure 23. View showing test pit stratigraphy



Figure 24. View showing stratigraphic profile exposed in the southern baulk

Figure 25. GIS plan showing sites within the southern area: R11/2378, R11/2953, R11/2954 and R11/2955



Figure 26. GIS plan showing site R11/2378, identifying the area excavated and the area preserved within the esplanade reserve



Excavation and recording of the extension of the midden site was carried out Site R11/2379 between 13 and 28 February 2014. The turf and topsoil were stripped, the shell Extension extent recorded and sampled, and then stripped to the subsoil. A number of features excavated into the subsoil were noted, and these continued further inland and to the north of the recorded site, away from the shell midden (Figure 27–Figure 29). The topography of the area was generally flattish, with a fairly sharp descent of approximately 4.5m on the eastern edge of the area of works. A small central knoll rose gently 0.5 to 1.0m above the surrounding area, reaching 9.5m above sea level. No features were visible across this surface prior to excavation. The topsoil in this area was quite shallow, being no more than 200mm thick. During the dry summer months of the excavation this topsoil was noted to be of a light brownish grey colour and quite dusty. Below this was a light brownish yellow clayey subsoil derived from volcanic tephras. When exposed to the sun this had the tendency to bake exceptionally hard and crack. Any feature walls thus exposed in the past would be likely to have failed once winter rains arrived. The dry period over the excavation meant that fill colours remained muted, and distinguishing features was challenging even when water was sprayed over the area.

The features investigated represent an extension to site R11/2379, being situated inland from the originally recorded portion of the midden deposit. The additional midden was noted to spread irregularly over an area of approximately 20m by 10m (Figure 27 and Figure 52). It is thought likely that the majority of material had been spread into this area by ploughing and other farming activities, particularly as the alignment of this material followed a natural dip which drained down into a small gully. Multiple plough lines were noted to run through the site, following a range of alignments. It was found that the shell deposit was generally quite thin, with a maximum thickness of just 50mm. Many of the remaining features were also very shallow.

A range of other features were noted to extend away from the midden, primarily to the north. These included various pits, drains, fire scoops, and postholes forming house structures, probably early Maori in origin (see Figure 29 and Figure 30–Figure 32). These spread over an area measuring approximately 65m (NS) by 45m (EW). The features clustered in quite clear groupings which are likely to have been based on function. At the southern end midden and circular fire scoops, were present and these represented the food cooking and preparation area. Just to the north of this a group of food storage pits was identified, situated on the northeastern side of a small knoll and with drains descending out of the downslope corners and draining away to the northeast. This was an area of food storage. Further to the north of this was a large collection of postholes and square or rectangular fire scoops, features which were identified as houses, windbreaks, drying racks and hearths for heating, and as such this was more of an occupation/living area.

Site R11/2379Three house structures were identified, of which one appeared to have been<br/>rebuilt at some point along a slightly different alignment. A series of postholes<br/>from modern fence lines were also noted through the area.

All of features inland from the extent of works were removed, with just the originally recorded site extent remaining intact. Approximately 20% of the site remains in situ.

#### Phasing

There were almost no intercutting features present in this site, making the identification of any phasing between features nearly impossible. The apparently tight functional grouping of features suggests much of the activity took place over a fairly short space of time, probably over the space of a single generation, but this is not certain.

One group of postholes, identified as relating to House 1 (Figure 57, below) appeared to have been modified over time. This modification is likely to have been either in the form of repairs to the structure, or possibly a change in size and orientation. The posthole alignments were difficult to assess, and were similarly unclear during excavation. The impact of ploughing activities through this area had not helped preservation of these features either, with many being very shallow.

There also appeared to be a phase change within the main pit cluster, with two features, (2) and (3), highlighted as being constructed on distinct alignments from the rest of the cluster (Figure 52) and also these pits were deliberately backfilled. This contrasted with the remaining pits, which appeared to have been left open and backfilled through natural processes



Figure 27. Stitched panorama facing southeast to south showing soil stripping exposing the main midden deposit

# Site R11/2379MiddenExtension,<br/>continuedThree areas of midden were preser<br/>quite shallow, with a maximum dep<br/>action deaths has alwaching. These

Three areas of midden were present (Figure 29 and Figure 33).<sup>20</sup> These were quite shallow, with a maximum depth of 50mm, and disturbed throughout their entire depths by ploughing. The soil matrix for these deposits was noted to mirror that of the surrounding topsoil, being light brownish grey silt. A total of seven 1m<sup>2</sup> test pits were excavated into the main deposit, (1) (Figure 34 and Figure 35). Five 10 litre samples were collected from this context. The deepest deposits of midden within this feature were found in association with a concentration of fire scoops, representing cooking activities.

Feature (20) was in very poor condition, being almost completely ploughed out (Figure 36 and Figure 37). The deposit was very sparse and had a maximum depth of just 10mm, being spread over an area measuring 3.9m by 2m. No samples were collected from this feature.

A third midden deposit, (131), was identified along the northern edge of the property (Figure 38 and Figure 39). This measured 5m by 4.150m, and was up to 30mm thick. A single 1m<sup>2</sup> test pit was excavated into the deposit (Figure 40 and Figure 41), with two 10 litre samples collected.

A detailed analysis of the midden samples is presented below within the Midden Analysis section. Eighteen out of the total of 26 artefacts recovered from R11/2379 were collected from midden deposit (1).



Figure 28. Stitched panorama facing south to southwest showing stripped area with house floors present
Continued on next page

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<sup>&</sup>lt;sup>20</sup> Features (1), (20) and (131).

Figure 29. GIS plan showing site R11/2379. The trenches to the west are exploratory trenches 1 (southern) and 2 (northern)



Figure 30. Close-up plan of R11/2379, showing the southern section of the site



Figure 31. Close up plan of R11/2379, showing the middle section of the site





Figure 32. Close up plan of R11/2379, showing the northern section of the site



Figure 33. Stitched panorama with a view facing northeast to south through southeast, showing the main midden (1) during recording



Figure 34. View facing southwest showing (1) during recording



Figure 35. View showing Test Pit 1 excavated within (1)



Figure 36. View facing south showing (20)



Figure 37. Close up view showing the sparse nature of (20)



Figure 38. View facing southeast showing (131)



Figure 39. View facing south showing (131)



Figure 40. View showing Test Pit 1 in (131) prior to excavation



Figure 41. View showing Test Pit 1 in (131) following excavation

# Site R11/2379Fire ScoopsExtension,<br/>continuedA total of 10 fire scoops were identified within the area.<sup>21</sup> All were at least<br/>partly, if not fully excavated. At this site two types of fire scoop were<br/>identified, being either circular or rectangular. The circle fire scoops (n = 3,

partly, if not fully excavated. At this site two types of fire scoop were identified, being either circular or rectangular. The circle fire scoops (n = 3, (30), (32), and (36)) were clustered in the vicinity of midden (1) and were noted to have a gentle to modern slope and a flat to concave base (see Figure 30 and Figure 42–Figure 44). This contrasted with the rectangular fire scoops (n = 7) which exhibited vertical edges and a flat or uneven base (see Figure 32 and Figure 45–Figure 47). The presence of burnt stone was variable across both fire scoops types, although the quantity of stone was somewhat greater within the circular features. Charcoal and fire staining was present in the base of all these features to some degree, although again the circular features exhibited the more intense staining.

A possible explanation for the distinction between these two types was based on function. The circular fire scoops are thought to have been earth ovens, as these are all situated in close proximity to the main midden deposit. The rectangular fire scoops are thought to have been utilised for heating, or possibly for smoking fish, shellfish or eels. This is because the rectangular fire scoops are situated in proximity to the houses and also to several linear rows of post holes that have been interpreted as drying racks.

No artefacts were recovered from fire scoops.

#### Pits

A total of 15 pits of various types and sizes were recorded in the area. All were at least partly if not fully excavated, along with internal features such as structural postholes and drains (see Figure 31, Figure 48 and Figure 49). At this site two types of pit have been identified. The small, but deep bin pit, and the larger, although shallow rectangular pit. Pits are generally assumed to have been used for kumara storage, but they may have had other uses.

Ten of the pits were noted to be of the large rectangular type.<sup>22</sup> All bar one, (142), were clustered in the main pit group on the northeastern side of a small knoll. These pits were primarily orientated in northeast to southwest fashion, apart from (3) which ran northwest to southeast. These pits were quite large, with the average length being 3.678m, and width being 1.700m (see Table 2, Figure 50 and Figure 51). They were however, generally very shallow, with an average depth of just 15.8cm.

<sup>&</sup>lt;sup>21</sup> Features (30), (32), (36), (92), (117), (126), (129), (133), (139), and (174).

<sup>&</sup>lt;sup>22</sup> Features (3), (4), (6), (9), (10), (12), (14), (16), (19), and (142)

**Site R11/2379** The ploughing and other farming activities were noted to have reduce the depth of these features, particularly since they were sited near the top of a small knoll which had been somewhat smoothed out by these practices. Feature (19) was exceptionally shallow, with little more than the internal and external drains remaining.



Figure 42. View facing east showing adjacent fire scoops (30) (32)



Figure 43. View facing south showing feature (30) half-sectioned



Figure 44. View facing south showing feature (36) half-sectioned



Figure 45. View facing north showing feature (92) half-sectioned

**Site R11/2379** Seven of these pits had external drains running from the lowest corners, and these were found to be complemented with internal drains. The internal drains primarily ran around the edge of the pit, with some, in particular features (6), (12) and (14) had additional drains crossing through the centre of the pits (see Figure 52–Figure 54).

Most of these pits exhibited a fine grey silt material, and the pits edges were quite worn. It is believed that these pits were left open at the end of their useful life and left to infill naturally. Two features contrast with this, (2) and (3). These pits were filled with a relatively bright brownish yellow material that consisted of redeposited subsoil, consistent with a deliberate backfilling even. Furthermore the two pits were arranged on a quite separate alignment from the rest of the pit cluster. This evidence suggests a separate phase of utility, possibly just prior to the main occupation, although no datable material was recovered from the features to confirm this.

The five bin pits were situated in two separate areas. Two of the pits, (2) and (29), were located adjacent to the two of larger pits. The other three were positioned in relatively close proximity to the houses. These pits were quite small in size, with the average length being 1.072m, and width being 0.610m (see Table 2, Figure 55 and Figure 56). They were also quite deep, with an average depth of 31.2cm.

The two bin pits within the pit cluster were rectangular in shape. Two of the pits identified close to the houses, (77) and (78) had a more rounded appearance. Feature (77) was not unlike the deep, straight-sided, round pits identified as rua kopiha by Campbell (2011: 30) at the NRD site.

Feature (77) was found to contain two obsidian artefacts and (78) was found to contain three obsidian artefacts. These items were mixed into the primary yellow brown fill of the feature, which accounted for around two-thirds of the depth of fill. A fine grey silty material occupied the concave upper level of the pit, having the appearance of being washed into the pit over time.



Figure 46. View facing southwest showing feature (129) half-sectioned



Figure 47. View facing south showing feature (133) half-sectioned



Figure 48. View facing southeast showing pit arrangement. Scale is situated within (14)



Figure 49. View facing south showing pit arrangement. Scale is situated within (19)

Feature	Length	Width	Depth	
(3)	2600	1200	140	
(4)	4050	1800	60	
(6)	4700	1800	110	
(9)	2450	1680	370	
(10)	4850	2070	140	
(12)	3450	1900	280	
(14)	5530	2070	160	
(16)	3500	1740	190	
(19)	2920	1690	30	
(142)	2730	1050	98	
(2)	1160	660	100	
(29)	1450	560	210	
(77)	720	490	390	
(78)	1400	840	650	
(217)	630	500	210	

Table 2. Pit feature dimensions. Top group are pits of the large rectangular type, while the lower group are the bin pits



Figure 50. View facing south showing feature (12) half-sectioned



Figure 51. View facing east showing feature (10) half-sectioned



Figure 52. Plan showing the internal and external drains of features (4), (6), and (9)



Figure 53. Plan showing the internal and external drains of feature (12)



Figure 54. Plan showing the internal and external drains of features (10), (14), (16) and (19



Figure 55. View showing (77) half-sectioned

Figure 56. View showing (77) half-sectioned

#### Site R11/2379 Houses

Extension, *continued* 

There were several closely related alignments of postholes that are considered to have indicated the presence of three houses.

House 1 measured 5.1m (NW-SE) by 4.4m (NE-SW). This was defined by postholes on all four sides (Figure 57 and Figure 58). There are several ways to interpret the posthole cluster in this location. The favoured version is that the structure faced towards the northwest with what is considered to be a porch structure at the northern end. A further internal division was present at the southern end of the structure. A separate interpretation is that the building was wider than deep, and opened to the northeast. In this version the structure would have had a double internal lines of postholes. It is also possible that the building underwent repairs at some point during its lifespan. There were a large number of additional postholes, situated outside of what is considered to be the main structure; these may have been windbreaks or rack structures of some kind. Many of these postholes were quite shallow, and had clearly been truncated. A total of 29 postholes defined the house extent, and these had a maximum depth of 228mm, with an average of 119mm. Any evidence of a house floor was most likely destroyed by ploughing, although the house extent as defined was relatively flat. The posthole fills were consistently a fine greyish silt material. A posthole situated just to the north of the front porch was found to contain an obsidian artefact.

House 2 measured 4.8m (NW-SE) by 3.3m (NE-SW). This was defined by postholes on all four sides, although a large gap between postholes was present along the SW facing wall (Figure 59). Many of these postholes were quite shallow (of the 22 postholes the maximum depth was just 156mm, and the average depth of this group was 87mm) and had clearly been truncated. Any evidence of a house floor was most likely destroyed by ploughing, although the house extent as defined was relatively flat. These were some postholes present around the exterior of the house as defined, and it is unclear what these formed, although it may have been windbreaks. There was no evidence visible of a possible house floor. The posthole fills were consistently a fine greyish silt material.

House 3 measured 3.8m (NE-SW) by 3.6m (NW-SE). This was defined by rows of postholes on all four sides, with associated footing trenches (Figure 60 and Figure 61). A total of 23 postholes and slots defined this house, with an average depth of 116mm, and the deepest being an outlier of 390mm. The extent of this structure was very clearly observed, with some reasonable space between this structure and other posthole features. Any floor or occupation surface associated with the house had been reduced to a vague smear by ploughing. The posthole fills were consistently a fine greyish silt material.

# Site R11/2379 Drying Racks A number of posthole alignments were identified, both in the immediate vicinity of the house structures, and a further grouping was situated just to the north of the houses (Figure 62). It is thought possible that these were drying or smoking racks, or a similar type of structure for consumables such as fish, shellfish or even eels. The lack of fishbone identified within the midden does not add any evidence to support this interpretation, although the paucity of bone may be explained by other factors, such as a lack of preservation as a result of ploughing and other farming activities, or that the fish were prepared on site but consumed elsewhere.

Some 16 features made up the main northern group of postholes. These were found to quite large in diameter (the average was 309mm), but shallow in depth (the average was 44mm). The posthole fills were consistently a fine greyish silt material.



Figure 57. Plan showing the posthole alignment with suggested footprint of House 1 highlighted

Figure 58. View facing north showing excavation of postholes forming House 1



Continued on next page



Figure 59. Plan showing the posthole alignment with suggested footprint of House 2 highlighted



Figure 60. Plan showing the posthole alignment with suggested footprint of House 3 highlighted



Continued on next page

Figure 61. View facing south showing excavation of postholes forming House 3



Figure 62. Plan showing the posthole alignment of possible drying racks

**Site R11/2952** This midden site was identified during soil stripping works along the gully. The site was excavated on 7 February 2014. The turf and topsoil were stripped, the shell extent recorded and sampled, and then stripped to the subsoil.

The site consisted of two smallish shell patches. The larger site measured 4m (NW-SE) by 3.5m (NE-SW), while the smaller was 3m (NE-SW) by 1.4m (NW-SE). Both portions were up to 30mm thick, and noted to be fairly heavily disturbed by farming activities and cattle trampling. The midden was noted to be overwhelmingly composed of oyster shells, and therefore may relate to the early European occupation of this property. No additional features or artefacts were noted.

Figure 63 and Figure 64 show the site, with the plan presented in Figure 65

This site was removed during works, and therefore none of the site remains intact. No further analysis of this site was undertaken.



Figure 63. View facing west showing site R11/2952

Figure 64. View facing south showing site R11/2952

Figure 65. GIS plan showing site R11/2952. Core midden deposits are highlighted in dark grey



**Site R11/2953** This midden site was identified during works installing a silt fence. This site was excavated on 7 February 2014. The turf and topsoil were stripped, the shell extent recorded and sampled, and then the area was stripped to the subsoil.

The site measured 6.3m (E-W) by 1.4m (N-S). The full north-south extent of the site was not exposed due to the limit of excavations, but probing the site identified that it continued for at least 7m to the south. The site was noted to be fairly heavily disturbed by farming activities and cattle trampling. The shell material was quite patchy and dispersed through the matrix, but up to 150mm thick in places. This midden was largely composed of cockle shells, although pipi and gastropods were also present. No further features were identified. A fragment of chert was identified during the analysis of the bulk sample from this site.

All of the portion of the site within the silt fence was removed during works, and therefore it is estimated that 80% of the site remains intact. See Figure 66 and Figure 67 for photographs of the site, with a site plan showing the excavated and preserved extents presented in Figure 68.



Figure 66. View facing west showing site R11/2953

Figure 67. View facing east showing site R11/2953

Figure 68. GIS plan showing site R11/2953



**Site R11/2954** This midden site was identified during bulk soil stripping works on 12 February 2014. The site was very heavily damaged, with just the presence of shell material noted. No further features or artefacts were noted.

The site measured approximately 8m x 3m and up to 1cm thick. No samples were collected from this site due to its poor condition. See Figure 69 and Figure 70 for photographs of the site, with the GIS plan displayed in Figure 25.



Figure 69. View facing east showing site R11/2954

Figure 70. View facing east showing area of site R11/2954

SitesSites R11/1359 (midden) and R11/1360 (possible terrace) were not affected by<br/>the works. Site R11/1361 (depression) could not be identified in recent field<br/>surveys, and no features were exposed in the recorded location during the<br/>earthworks.

**Site R11/2955** This midden site was identified during bulk soil stripping works. The site was excavated over the period 21 to 24 February 2014. The turf and topsoil were stripped (Figure 71 and Figure 72), the shell extent recorded and sampled, and the area then stripped to the subsoil.

The site measured 14.5m (NW-SE) by 9m (NE-SW). The site was noted to be moderately disturbed by farming activities and cattle trampling, with plough lines noted to run through the site. A series of three 1m<sup>2</sup> test pits were excavated into the deposit (Figure 73). The shell material was generally very thin, ranging from 30mm to 60mm thick (Figure 74). A range of shellfish species were noted, including cockle, pipi, mud snail, oyster and a range of gastropod species. Ten obsidian artefacts were recovered from this site. A series of 19 small post or stake holes and a remnant fire scoop were also recorded when the midden layer was stripped from the site (Figure 75 and Figure 76).

It is considered likely that these represent a series a small windbreaks or temporary shelters. The arrangement of postholes appears quite chaotic, with some damage to the site by farming activities possibly removing features from the record. It is also possible that they are the result of several episodes of changing or modifying the shelters.

The area was reduced significantly in height following the completion of recording, and therefore none of the site remains in situ.



Figure 71. Stitched panorama with a view facing south through west to north showing R11/2955 and works in the vicinity



Figure 72. View facing west showing site R11/2955



Figure 73. View showing a test pit excavated into R11/2955



Figure 74. View showing the stratigraphic profile within a test pit



Figure 75. View facing northwest showing exposed postholes following the removal of the midden layer

Legend Artefacts NContours Features R11-2955 5442 7°40 8 9 °11 29 R11/2955 917 28 2955 °45 22 °44 2.5 7.5 10 m 5

Figure 76. GIS plan showing site R11/2955

Site R11/2956 This site was a timber structure identified during deep gully excavation works. The site was excavated on 11 February 2014. The extent of the feature was mapped in situ and then excavated by machine, with timbers recovered and recorded.

It is unclear what purpose this structure served, as although it was a rectangular timber lined feature not unlike a well, its situation meant that saltwater would have filled this area on the tide. The structure measures 1.5m by 1.5m, and was a minimum of 1.2m deep. This feature was probably of either late 19th century or early 20th century date. Pieces of iron strapping and part of an iron hitching post, possibly of 19th century origin were recovered from the fill of this structure. A number of 19th century artefacts were also collected from further up the gully, indicating use of this area during that period, probably for rubbish dumping.

The timbers from this structure were recovered and examined on site. A total of 74 individual timber fragments were recovered (Table 3). Of these 32% of the total number was identified as either heavily damaged fragments, or pieces of natural timber. Nearly 45% were noted to be simple planks, while 12% were recorded as either pieces of moulded timber, or moulded skirting boards (Figure 79 and Figure 80). It was clear that a large number of the pieces were reused or recycled timber, with nearly 42% (n = 31) of the pieces having either nails or, more commonly, nail holes present. Saw marks were also common, with 43% (n = 32) having some form of saw mark present (Figure 81 and Figure 82).

The area was completely excavated and therefore none of the site remains in situ. See Figure 77 and Figure 78 for photographs of the site.



Figure 77. View facing east showing the exposed timber structure in the gully excavations



Figure 78. View showing the timber structure in the gully excavations
## **INVESTIGATION RESULTS, CONTINUED**

Type Name	Count of Type	% of Total
Block	8	10.81
Moulding	2	2.70
Natural	3	4.05
Plank	33	44.59
Skirting	7	9.46
Fragment	21	28.38
Grand Total	74	100



Figure 79. Timber 1, a piece of skirting board



Figure 80. Timber 2, a piece of skirting board



Figure 81. Timber 9, a plank with circular saw marks Figure 82. Timber 18, a plank with saw marks

## **EUROPEAN ARTEFACT ANALYSIS**

Introduction	An assemblage of material was collected from the Timberly Road excavations including glass, ceramic, metal, and bricks. This material was primarily recovered from the base of the central gully that drains west to east through the property. The material was analysed and the results are presented below.
Glassware	A total of 19 pieces of glassware were recovered during the excavations. These can be attributed to a total of six bottles (Table 4).
	A bottle, missing only a portion of the rim, was collected from the eastern end of the main gully in the vicinity of the silt fence (Figure 83). The bottle was dark olive green in colour, usually attributable to beer; however the shape of the body suggests the likely contents may have been whisky or gin. The bottle had a round cross-section and was tapered from the shoulder to the base; the base was 93.65mm wide while the shoulder was 94.80mm wide. The finish was in a collar skirt style and was applied. There were no mould lines on the body and neck, but a faint mould line was visible at the base. The base was formed using a domed tool with a central nipple.
	A single body fragment in aqua glass originating from an unidentified bottle was collected from the north end of the main gully. The fragment may have originated from a food bottle or a household product bottle.
	Bulk stripping of the south side of the main gully produced a shoulder fragment from a cobalt blue pharmaceutical bottle possibly containing castor oil or perhaps a product such as hair restorer.
	Six pieces of at least one green beer bottle were collected from the southern end of the main gully and included two fragments relating to the base showing a shallow domed kickup and four fragments relating to the main body of the bottle.
	Nine pieces of olive green glass recovered from the base of the main gully were attributed to at least one half-pint bottle of black beer and included a complete base, complete rim and neck and seven pieces of body glass (Figure 84). The rim had a collar-band finish and the basal kickup was formed using a conical shaped tool. A fragment of the base of a case gin bottle was also collected.
	Continued on next page



Figure 83. Artefact E5, alcohol bottle

Figure 84. Artefacts E19 and E20, rim and base of black beer bottle

Table 4	. Catalogue of glass items									
ID	Provenance	Category	Туре	Sub Type	Rim Type	Base Size	Height	Piece Type	# Pieces	Colour
5	lower end main gully eastern end	alcohol	whisky/ gin		collar skirt	93.65	259	almost complete missing part rim	1	dark olive green
39	main gully north	unidentified	bottle					body fragment	1	aqua
22	main gully south side	pharmaceutical	castor oil?					shoulder fragment	1	cobalt
44	main gully south	alcohol	green beer					part base and body fragments	6	green
19, 20	main gully base	alcohol	black beer	half pint	collar band	76.91		base, rim, neck, body fragments	9	dark olive green
21	main gully base	alcohol	case gin					part base	1	dark olive green

CeramicA total of 61 pieces of ceramic were recovered during the excavations. TheseMaterialcan be attributed to a total of 33 objects (Table 5).

The majority of a hand-formed kiwi was recovered from the southwestern corner of the property (Figure 85). The object was missing the legs and the bill of the bird. Wire appeared to have been set within the clay to give strength to the legs, probably in order to have the bird in a standing position. This particular item was found in isolation with no other artefacts recovered in the vicinity.

A number of ceramic fragments were recovered from the north end of the main gully. Seven pieces of a Willow pattern tureen lid were identified with six pieces rejoining. This partial lid may be associated with a separate portion of a tureen lid recovered from the base of the gully (Figure 86 and Figure 87). One fragment of the rim section of a tureen dish was also collected. Willow pattern was also noted on seven fragments of ceramic originating from an oval shaped serving dish, of which three pieces rejoined forming a partial base and rim (Figure 88). Two fragments of ceramic appear to have originated from a teacup. One further fragment of Willow pattern ceramic possibly originated from a small item such as a saucer or bread plate.

Three pieces of a plate (bread or dinner) were recovered, showing a likely scenic print at the centre of the well and having a border similar to the Vermicelli pattern (Figure 89). One large fragment of a dinner plate well was recovered, with a geometric and floral design; however, the pattern was not identified (Figure 90). A portion of the rim and neck of a jug or ewer was collected bearing a rectangular geometric border with a floral spray sited below (Figure 91). One fragment of the teacup was decorated with a blue print depicting a complex of adjoined buildings (Figure 92). A partial rim and body fragment of a chamber pot were also collected (Figure 93). Two pieces of a saucer were recovered bearing an imitation jasper relief. While these two fragments did not rejoin, one of the pieces did rejoin with a fragment recovered from the south side of the gully and was probably also associated with two larger fragments recovered from the base at the south end of the gully. Two pieces of a terracotta pot were also recovered.

Bulk stripping at the west end of the gully produced five fragments of ceramics. Two fragments originated from a saucer and bore the vermicelli-like border. A fragment of a teacup was decorated with a blue print, but the design was too fractured to determine the image depicted. One small fragment was decorated on both the interior and exterior of the ceramic, but the vessel form could not be identified with certainty. A fragment of a saucer or bread plate rim was identified and bore the remains of a single gilt hairline band.

Figure 85. Artefact E46, ceramic kiwi







Figure 86. Artefacts E26, 32 and 33, willow pattern tureen





Figure 88. Artefacts E28, 35, 36, willow pattern serving dish



Figure 89. Artefacts E24, plate with unknown pattern, similar to 'Vermicelli'



Figure 90. Artefact E31, plate with unknown pattern



Figure 91. Artefact E23, ewer neck with unknown pattern



Figure 92. Artefact E30, teacup with unknown pattern

Figure 93. Artefact E29, chamber pot with unknown pattern

**Ceramic Material,**  *continued* Ceramics recovered from the south end of the gully included four fragments which rejoined to form much of the base and a portion of the lower body of what may have been a vase or other ornamental item. One fragment of a blue printed ceramic was not identified to a particular vessel form (Figure 94). Three plain white fragments of different plates (possibly bread or saucer) were also noted.

Bulk stripping of the south side of the gully recovered several pieces of ceramic. Three pieces were related to a large sized teacup and bore an unknown blue printed geometric design (Figure 95). A section of the rim portion of an imitation jasper saucer was recovered and rejoined to a piece from the north end of the gully. A large rim fragment of a dinner plate was decorated with the Rouen design in purple. A small fragment of a teacup was noted and bore a blue print, possibly depicting a Grecian inspired scene. A second teacup fragment may have been associated, but this could not be determined with certainty. A small fragment of ceramic from an unidentified vessel was hand painted in orange.



Figure 94. Artefact E42, fragment of unknown pattern

Figure 95. Artefact E6, teacup with unknown pattern

**Ceramic** Ceramics recovered from the base of the gully include a large corner portion of a tureen lid decorated in the blue Willow pattern (see Figure 87). It is possible that this portion of lid was associated with pieces recovered from the north end of the gully. A partial tureen handle was also recovered and may have been associated. Four pieces of a blue transfer printed mug were recovered with two pieces rejoining to form a partial side and handle (Figure 96). A section of the base was also present along with a portion of the opposite end of the neck portion of a jug or ewer was recovered bearing the same design as the portion collected from the north end of the gully, suggesting they were likely to have been derived from a single vessel. Two fragments of an imitation jasper saucer were likely to have been associated with other pieces noted above.

Figure 96. Artefacts E13, 17 and 18, mug with unknown pattern



Table 5. Catalo	gue of ceramic items							
ID	Provenance Feature	Glaze	Base Colour	Technique	Pattern Colour	Pattern Name	Form	Fragment
1	bulk strip at west end of gully	clear	white	transfer	blue	unidentified	saucer	2 pieces
2	bulk strip at west end of gully	clear	white	transfer	blue	unidentified	teacup	1 piece
3	bulk strip at west end of gully	clear	white	transfer	blue	unidentified	unidentified	1 piece
4	bulk strip at west end of gully	clear	white	transfer	gilt	unidentified	bread plate/saucer	1 piece
6	bulk strip south side of gully	clear	white	transfer	blue	unidentified	teacup	3 pieces
7	bulk strip south side of gully	clear	white	relief/painted	blue	Imitation Jasper	saucer	1 piece
8	bulk strip south side of gully	clear	white	transfer	purple	Rouen	dinner plate	1 piece
9	bulk strip south side of gully	clear	white	transfer	blue	unidentified	teacup	1 piece
10	bulk strip south side of gully	clear	white	transfer	blue	unidentified	teacup	1 piece
11	bulk strip south side of gully			handpainted	orange	unidentified	unidentified	1 piece
12	main gully base	clear	white	transfer	blue	Willow	tureen lid	1 piece
13, 17, 18	main gully base	clear	white	transfer	blue	unidentified	mug	4 pieces
14	main gully base	clear	white	transfer	blue	unidentified	tureen lid handle	1 piece
15	main gully base	clear	white	transfer	blue	unidentified	jug/ewer	1 piece
16	main gully base	clear	white	relief/painted	blue	Imitation Jasper	saucer	2 pieces
23	main gully north	clear	white	transfer	blue	unidentified	jug/ewer	1 piece
24	main gully north	clear	white	transfer	blue	unidentified	plate	3 pieces
25	main gully north	clear	white	transfer	blue	Willow	cup	2 pieces
26,32,33	main gully north	clear	white	transfer	blue	Willow	tureen lid	7 pieces, 6 refit
26	main gully north	clear	white	transfer	blue	Willow	tureen base	1 piece
27	main gully north	clear	white	relief/painted	blue	Imitation Jasper	saucer	2 pieces

Table 5, continue	ed. Catalogue of ceramic items							
ID	Provenance Feature	Glaze	Base Colour	Technique	Pattern Colour	Pattern Name	Form	Fragment
29	main gully north	clear	white	transfer	blue	unidentified	chamber pot	2 pieces
30	main gully north	clear	white	transfer	blue	unidentified	teacup	1 piece
31	main gully north	clear	white	transfer	blue	unidentified	dinner plate	1 piece
34	main gully north	clear	white	transfer	blue	Willow	bread plate/saucer	1 piece
38	main gully north			terracotta		none		2 pieces
41, 43	main gully south	clear	white			none	vase?	4 pieces
42	main gully south	clear	white	transfer	blue	unidentified	unidentified	1 piece
46	GPS7 silt fence	brown	cream	moulded			kiwi	most body
Un-numbered	main gully south	clear	white			none	plate	1 piece
Un-numbered	main gully south	clear	white			none	plate	1 piece
Un-numbered	main gully south	clear	white			none	plate	1 piece

**Metal Items** A total of 9 pieces of metal were recovered during the excavations. These can be attributed to a total of 9 objects (Table 6).

An iron shoe from a large workhorse was recovered near context 27 of site R11/2379. The shoe was forged for a hind hoof (Figure 97). There was no trace of either toe or heel caulks. A smaller horseshoe (Figure 98) was located in Trench 1, the southernmost of two exploratory trenches dug over a distance of approximately 60m west from the main excavation of R11/2379 (Figure 29). This was also made for a hind hoof ; it retained evidence of two toe caulks and appeared to have had a square toe angled towards the outside of the toe, suggesting the shoe was made for a horse with either a temporary or permanent conformation issue where the hoof strikes the opposite limb (termed winging). This particular type of shoe is designed to straighten the flight of the hoof.

An iron post was recovered from within the timber structure (R11/2956) located in the base of the main gully (Figure 99). A wooden rod passed through the larger section (upper) and one of these would have been located at each end of the rod with a third located at the centre in an opposite orientation. It is likely that the single post recovered was part of a once complete buggy hitch. Also recovered in this area was a length of metal strapping with a width of 3.6cm; the former use of the strap was not identified.

Bulk stripping at the western end of the main gully produced heavily corroded remains of a nail and what may have been a bolt. Also collected was an item similar to a shackle but not functioning as such, with attachment points not facing each other (Figure 100). It is likely that this item was attached to a solid item, possibly a wall, or was designed to connect with chain links.

Two pieces of heavily corroded metal were collected from the south end of the main gully. The two pieces were not conclusively identified but may have been from a large nail or a bolt.

A shotgun shell was collected from above the midden R11/2379. An impression on the base included BEL No 12 and a further word which could not be interpreted due to degradation. The manufacturer and date of this 12 gauge shotgun shell have not been determined.



Figure 97. Artefact E48, large horseshoe



Figure 98. Artefact E47, smaller horseshoe



Figure 99. Artefact E50, iron hitch



Figure 100. Artefact E49, iron nail, bolt and possible shackle

ID	Provenance	Metal	Туре	Subtype
48	R11/2379 near context 26	iron	horseshoe	large workhorse
47	R11/2379 Trench 1	iron	horseshoe	small shoe
50	R11/2956	iron	hitch	
49	Bulk strip at west end of main gully	iron	nail?	
49	Bulk strip at west end of main gully	iron	bolt?	
49	Bulk strip at west end of main gully	iron	unidentified	
52	Main gully south	iron	unidentified	
45	R11/2379 midden surface		shotgun she	əll
51	R11/2956	iron	strap	

#### Table 6. Catalogue of metal items

# **Brick Items** A total of 2 pieces of brick were recovered during the excavations. These can be attributed to a total of 2 objects (Table 7).

An almost complete brick was collected from the south end of the gully (Figure 101). Extrusion and wire cut marks were visible. The brick measured 21cm x 6.5cm x 9.5cm and the interior did not show any visible inclusions.

A small portion of a pale orange brick was collected from the north end of the gully. Extrusion marks were visible on one end of the brick; however, no further marks were noted.

#### Table 7. Catalogue of brick items

ID	Provenance	Measurement	Colour	Make
40	Main gully south	21 x 6.5 x 9.5	pale orange	wire cut/extruded
37	Main gully north	incomplete	pale orange	extruded



Figure 101. Artefact E40, wire cut brick **Introduction** An assemblage of stone artefacts was collected from the Timberly Road excavations. A technological analysis of the material was completed by Joe Mills of the University of Auckland. The results of this work are presented below.

The combined stone artefact assemblage from sites R11/2379, R11/2953 and R11/2955 at Timberly Road was relatively small. It comprised 37 individual artefacts, consisting predominantly of obsidian (n = 25), with smaller amounts of both chert (n = 8) and fine-grained stone (n = 4), including flakes, fragments (broken or incomplete flakes), a manuport, a single potential tool and a single core. The majority of artefacts were fragments, which possibly indicates a high level of post-depositional disturbance, consistent with reported ploughing in the area.

- **Methodology** Dimensions for all artefacts were recorded, including the maximal length and width in millimetres, and the weight in grams. Material type was noted, either obsidian, chert, or fine-grained stone. Additionally, the state of the artefact was recorded: whether it was a complete flake, with a readily identifiable platform, termination and lateral margins; a fragment, with some but not all flake characteristics; a core, with multiple flake removal surfaces; or a tool, either broken or complete (see Table 8–Table 10).
- **Results** The obsidian artefacts were mostly fragmentary, probaby due to postdepositional disturbance at the site combined with the fragile nature of obsidian. Of the 25 obsidian artefacts, 15 were fragments, 9 were flakes, and there was a single core. All of the obsidian artefacts were fairly small, as expected from the highly fragmentary nature of the assemblage. The mean length was 21.98mm, with a maximum of 39.3mm and a minimum of 11.4mm. The mean width was 15.5mm, with a maximum of 33.9mm and a minimum of 6.3mm. All obsidian artefacts were very light, with a mean weight of 2.3g, with a maximum of 9g and a minimum of 0.17g.

Sixteen of the obsidian artefacts were subjected to XRF and subsequently assigned to distinct sources (Table 8 and Table 10, and see following section). As would be expected from different acquisition strategies and resource accessibility, the different sources displayed different average dimensions. The mean weight of the Great Barrier Island artefacts was 4.2g, as compared to the 2.6g from the Mayor Island artefacts. The single Hahei sourced artefact weighed 4.4g.

**Results**,

continued

Figure 102. Artefact A7, obsidian coreflake from Hahei

source

This difference in weight, while small, may indicate economising strategies with the use of Mayor Island obsidian. Mayor Island obsidian is of better quality than Great Barrier material, but also more difficult to access, therefore any supply is likely to be more heavily utilised. This argument may be further reinforced by the lack of cortex on the Mayor Island artefacts, indicating that the cortex was removed prior to transport to the site, increasing the workable surface of a core to be flaked, and reducing weight taken up by less useful cortical surfaces. Further, the single artefact from Hahei (A7) (being the farthest away from the Timberly site) was a core-flake with multiple flake scars on its dorsal surface indicating heavy reduction (Figure 102).



10 mm

The chert artefacts from the site were diverse. The mean weight was 13.1g, continued with the maximum being 46.1g and the minimum being 0.3g. The size of the artefacts was equally as variable, with a mean length of 33.77mm (max. 50.8mm, min. 17.7mm) and mean width of 23.48mm (max. 49mm, min. 10.1mm). Of the eight artefacts, six were fragments – this seems to be due to the very coarse nature of the stone. The other two artefacts were a possible drill point, and a manuport pebble. The pebble (A11) was water-rolled and quite small, probably too small to be flaked, but of the same material as the rest of the chert artefacts (Figure 103). Artefact A3 was a possible drill point that appeared to be from a different chert source, based on its appearance, which tapered directly to a sharp point (Figure 104). There were no signs of secondary flaking of the artefact, however, which weakens the argument for this drill point being deliberately made or just a convenient accident of the larger flaking process.

Figure 103. Artefact A11. chert manuport

**Results**,



10 mm

Figure 104. Artefact A3, possible drillpoint



#### Results, continued

The remaining four artefacts were all composed of relatively fine-grained stone. One artefact (A1) was distinct for being particularly coarse-grained and showing signs of oxidisation, indicating that it had been thermally affected. Two of the other artefacts (A8 and A10) were more fine-grained with a pale grey appearance (Figure 105 and Figure 106). Both were flakes, but were noticeably weathered, with water-rounded edges. The final artefact (A25) was a highly polished adze flake, most likely of Motutapu Greywacke (Figure 107 and Figure 108). The flake was 53mm long, 30mm wide, and is likely to have flaked off from the top of the butt portion of a moderately sized adze, based on the angle of the butt end. It was finely polished toward the butt portion, becoming less finished toward the termination.



Figure 106. Artefact A10, weathered finegrained stone flake



Figure 107. Artefact A25, polished adze flake dorsal surface



10 mm

Figure 108. Artefact A25, polished adze flake proximal surface



**Summary** Despite being relatively small, the Timberly Road assemblage contained most of the standard material for Maori lithic assemblages. Obsidian was well represented, with material from multiple sources, both some distance away from the site, indicating movement of resources into the area and possible strategies optimising the use of long-distance resources. The chert was likely to have been local, being relatively abundant in most areas. The fine-grained stone was difficult to conclusively source due to weathering, but the adze flake appeared most similar to Motutapu Greywacke.

The lithic assemblage lends some tentative support for certain activities at the site, with obsidian used for possible butchering and manufacturing tasks, chert used as a tougher alternative to obsidian and for drill points, and the fine-grained lithic material likely to have been related to adze use.

The fragmentary nature of the assemblage, combined with signs of weathering on some artefacts, indicates that post-depositional processes had impacted the stone assemblage to some extent, probably from ploughing.

<b>Table 8. R11</b>	/2379 ar	tefact list with record	ded attributes						
Site #	ID	Material	Obsidian Colour	XRF Characterisation	Туре	Cortex	Length (mm)	Width (mm)	Weight (g)
R11/2379	A1	Fine-Grained Stone	N/A	N/A	Fragment	Yes	65.8	39.4	60.82
R11/2379	A2	Obsidian	Green	Mayor Island	Fragment	No	19.3	17.5	3.1
R11/2379	A3	Chert	N/A	N/A	Tool	Yes	34	13.4	2.38
R11/2379	A4	Obsidian	Green	Mayor Island	Fragment	No	28.1	16.1	2.2
R11/2379	A5	Chert	N/A	N/A	Fragment	No	17.7	10.1	0.3
R11/2379	A6	Obsidian	Grey	N/A	Fragment	No	13	11.1	0.6
R11/2379	A7	Obsidian	Grey	Hahei	Core- flake	No	28.5	22.7	4.4
R11/2379	A7	Chert	N/A	N/A	Fragment	Yes	45.7	26.2	16.9
R11/2379	A8	Fine-Grained Stone	N/A	N/A	Flake	Yes	63.7	31.3	19.52
R11/2379	A9	Obsidian	Green	Mayor Island	Fragment	No	28.6	18.9	4.3
R11/2379	A10	Fine-Grained Stone	N/A	N/A	Flake	Yes	69.6	58.6	50.18
R11/2379	A11	Chert	N/A	N/A	Manuport	Yes	25.92	24.3	9.5
R11/2379	A12	Obsidian	Grey	Great Barrier	Fragment	No	34.5	17.8	4.5

#### Table 8, continued. R11/2379 artefact list with recorded attributes

Site #	ID	Material	Obsidian Colour	XRF Characterisation	Туре	Cortex	Length (mm)	Width (mm)	Weight (g)
R11/2379	A13	Obsidian	Green	Mayor Island	Flake	No	39.3	33.9	8.2
R11/2379	A14	Chert	N/A	N/A	Fragment	Yes	36.3	29.6	13.9
R11/2379	A15	Obsidian	Grey	N/A	Fragment	No	37.7	32.2	7.5
R11/2379	A16	Obsidian	Grey	Great Barrier	Flake	Yes	20.3	18.7	1.64
R11/2379	A17	Obsidian	Grey	Great Barrier	Flake	No	22.6	13.2	1.6
R11/2379	A18	Chert	N/A	N/A	Fragment	No	50.8	49	46.1
R11/2379	A19	Obsidian	Grey	N/A	Flake	No	11.4	9	0.19
R11/2379	A20	Obsidian	Green	N/A	Fragment	No	11.9	10.7	0.5
R11/2379	A21	Obsidian	Green	N/A	Fragment	No	15.2	10.7	0.19
R11/2379	A22	Obsidian	Green	Mayor Island	Fragment	No	26.6	18.2	1.7
R11/2379	A23	Obsidian	Grey	Great Barrier	Flake	No	19	15.1	1.14
R11/2379	A24	Obsidian	Green	N/A	Fragment	No	11.6	6.3	0.2
R11/2379	A25	Greywacke	N/A	N/A	Flake	Yes	53	30	53
R11/2379	A26	Chert	N/A	N/A	Fragment	Yes	39.8	21.1	15

#### Table 9. R11/2953 artefact list with recorded attributes

R11/2953         A1         Chert         N/A         Fragment         Yes         19.9         14.1         1	Site #	ID	Material	Obsidian Colour	XRF Characterisation	Туре	Cortex	Length (mm)	Width (mm)	Weight (g)
	R11/2953	A1	Chert	N/A	N/A	Fragment	Yes	19.9	14.1	1

#### Table 10. R11/2955 artefact list with recorded attributes

Site #	ID	Material	Obsidian Colour	XRF Characterisation	Туре	Cortex	Length (mm)	Width (mm)	Weight (g)
R11/2955	A1	Obsidian	Green	Mayor Island	Fragment	No	22.7	10.6	0.7
R11/2955	A2	Obsidian	Grey	Great Barrier	Fragment	No	36.7	23.2	9
R11/2955	A3	Obsidian	Grey	N/A	Flake	Yes	12.7	12.1	0.42
R11/2955	A4	Obsidian	Grey	Great Barrier	Fragment	No	18.5	14.2	1.74
R11/2955	A5	Obsidian	Green	Mayor Island	Flake	No	26.5	12.5	1.9
R11/2955	A6	Obsidian	Green	Mayor Island	Flake	No	18.4	14.2	0.7
R11/2955	A8	Obsidian	Green	N/A	Fragment	No	16.2	8.9	0.8
R11/2955	A9	Obsidian	Green	N/A	Fragment	No	12.6	8.2	0.17
R11/2955	A10	Obsidian	Green	Mayor Island	Flake	No	17.8	12.2	0.6

#### **ARTEFACT SOURCING**

**Introduction** A material sourcing analysis of the assemblage of stone artefacts collected from the Timberly Road excavations was completed by Andrew McAlister and Joe Mills of the University of Auckland. The results of this work are presented below.

A sample of 16 of the 25 obsidian artefacts from excavations undertaken during the Timberly Road project were characterised using non-destructive Xray Fluorescence (XRF) and assigned to geological sources.

AnalyticalThe XRF analysis was carried out at the Anthropology Laboratory, School of<br/>Social Sciences, University of Auckland, using a Bruker Tracer III SD portable<br/>X-ray Fluorescence (pXRF) analyser (see Appendix B). The instrument<br/>employs an X-ray tube with an Rh target and a 10mm² silicon drift detector<br/>(SDD), with a typical resolution of 145eV at 100,000cps. The X-ray tube was<br/>operated with a setting of 40 keV at 12µA, through a window composed of<br/>12mil Al and 1mil Ti filters (Bruker's Yellow filter).

Samples were analysed in an air path for 60 seconds. Each specimen was analysed twice on a different portion of its surface area to check for consistency and the values were averaged. A total of 14 elements were quantified (K2O, CaO, TiO2, MnO, Fe2O3, Zn, Pb, Ga, Th, Rb, Sr, Y, Zr, Nb). Concentrations were calculated as oxide percentages (%) for major elements and as parts-per-million (ppm) for trace elements using Bruker's S1CalProcess (ver. 2.2.33) software. Calibration details are given in the appendix.

Artefacts were cleaned in warm water to remove loose soil where necessary but no cleaning agents were used. Tests at the University of Auckland have shown that the use of chemical cleaning agents, such as dilute hydrochloric acid, is generally unnecessary and sometimes detrimental to XRF analysis of major elements, such as K2O, CaO and Fe2O3. Additionally, cleaning agents may remove surface residues and preclude future use-wear analyses.

**Results** There are at least 27 known obsidian sources in New Zealand, which are distributed across three major geographic zones (see Moore 2012; Sheppard et al. 2011) — Northland, the Coromandel Volcanic Zone and the Taupo Volcanic Zone (Figure 109). However, some sources are geographically close and compositionally similar, making it difficult to separate them completely by geochemical analysis.

Results,	These include:
continued	• The two Great Barrier Island sources (Awana and Te Ahumata), four sources near Taupo (Ben Lomond, Maraetai, Ongaroto, Whangamata Fault), and
	• Several sources around Rotorua (Ngongotaha, Hemo Gorge, Tarawera, Lake Rotokawau, Lake Okataina and Whakarewarewa). Only the sources of Whakamaru (near Taupo) and Lake Rotoiti (near Rotorua) from these areas are geochemically distinct.
	For this analysis 17 source groups were considered (Figure 109). A total of 277 reference samples from the University of Auckland's Anthropology Laboratory reference collection were used to characterise these sources.
	The calibrated results for the obsidian artefacts are reported in Table 11. To assign the archaeological specimens to a source, two methods were used: a graphical analysis using bivariate scatterplots and a multivariate discriminant function analysis.
Graphical Analysis	Because of the high number of potential sources, it is difficult to show their separation clearly on a single scatterplot. A better solution is to use a sequential approach, first separating the most geochemically distinct sources and then examining those with more similar compositions. A plot of the trace element ratios Sr/Zr against Log10(Rb/Zr) separates the reference specimens into seven groups (Figure 110). Five individual sources, Mayor Island, Kaeo, Weta, Lake Rotoiti and Waihi, form distinct clusters, while the other sources fall into two groups, denoted here as Groups 1 and 2 (Figure 110).
	Group 1 includes five sources, four from the Coromandel Volcanic Zone (Great Barrier Island, Fanal Island, Maratoto and Whangamata) as well as one Northland source (Huruiki). Seven sources are included in Group 2, three from the Coromandel Volcanic Zone (Tairua, Hahei and Cooks Beach) and four from the Taupo Volcanic Zone (Taupo, Rotorua, Whakamaru and Maketu).
	The archaeological specimens are associated with three of these clusters:
	8 from Mayor Island,
	7 with the Group 1 samples,
	1 sample associated with one of the sources in Group 2 (Figure 110).

Figure 109. Locations of New Zealand obsidian sources. Reference sample counts are shown in parentheses



Graphical Analysis, <i>continued</i>	The sources that were combined as Group 1 in Figure 110 can be separated using a scatterplot with different ratios of the same elements, Log10(Zr/Y) against Log10(Rb/Y) (Figure 111). All seven of the archaeological specimens assigned to this group are clearly associated with the Great Barrier Island reference samples. Finally, the sources that were combined as 'Group 2' in Figure 110 were examined using a scatterplot of the element ratios, Y/Sr against Rb/Sr. These element ratios separate the individual sources in this group, and show that the remaining specimen (A7 from site (R11/2955)) clusters with the Hahei source (Figure 112).
Discriminant Function Analysis	Discriminant function analysis was carried out using SPSS (ver. 20). Four trace elements were used (Rb, Sr, Y, and Zr), all of which were Log10 transformed to help equalize group variances. In total, there were six misclassifications with 97.8% of the reference specimens being classified correctly. Leave-out-one-cross-validation (LOOCV) resulted in two additional misclassifications (97.1% correctly classified). All archaeological specimens were assigned the same sources as in the bivariate scatterplots (Table 12).
Summary	The foregoing XRF chemical analysis of artefacts from the Timberly assemblage indicates that the majority of the obsidian specimens are derived from either Mayor Island (n=8) or Great Barrier Island (n=7) while a single artefact (Sample A7) is from Hahei on the Coromandel Peninsula.
	Continued on next page

Table 11.	Fable 11. Calibrated XRF results for the obsidian specimens. Reported values are the means of two analyses														
Sample	Assigned source	K <sub>2</sub> O	CaO	TiO <sub>2</sub>	MnO	Fe <sub>2</sub> O <sub>3</sub> T <sup>†</sup>	Zn	Pb	Ga	Th	Rb	Sr	Y	Zr	Nb
		%	%	%	%	%	ppm	ppm							
A1	Mayor Island	4.66	0.32	0.27	0.09	4.68	209	28		22	141	7	123	1041	82
									28						
A2	Great Barrier Island	4.64	0.72	0.09	0.03	1.34	38	22	15	23	197	24	42	127	12
A4a	Mayor Island	5.32	0.38	0.30	0.13	6.11	232	26	30	25	133	5	125	1078	87
A4b	Great Barrier Island	4.33	0.69	0.08	0.03	1.26	34	23	14	19	191	25	36	123	10
A5	Mayor Island	4.60	0.38	0.26	0.09	4.83	215	28	31	25	142	5	124	1050	85
A6	Mayor Island	4.53	0.35	0.29	0.10	5.04	206	29	29	22	132	7	117	1014	84
A7	Hahei	3.61	1.12	0.16	0.05	1.61	35	15	12	12	135	89	31	147	10
A9	Mayor Island	4.56	0.23	0.26	0.12	5.72	242	30	30	23	151	7	140	1223	96
A10	Mayor Island	4.91	0.41	0.31	0.14	6.45	243	29	31	30	140	13	132	1112	91
A12	Great Barrier Island	5.00	0.88	0.13	0.03	1.32	32	22	15	22	192	32	36	127	10
A13	Mayor Island	4.45	0.27	0.23	0.09	4.61	206	28	29	17	142	6	124	1056	84
A15	Great Barrier Island	4.64	0.76	0.09	0.03	1.32	36	20	16	18	196	24	39	124	11
A16	Great Barrier Island	4.43	0.77	0.09	0.03	1.33	34	22	15	20	203	24	40	129	11
A17	Great Barrier Island	4.35	0.65	0.08	0.03	1.39	36	22	15	19	198	22	41	125	10
A22	Mayor Island	4.78	0.32	0.25	0.09	4.85	220	32	30	24	149	9	128	1073	85
A23	Great Barrier Island	4.56	0.79	0.07	0.03	1.34	36	21	16	19	199	23	38	124	10

Figure 110. Plot of Sr/Zr against Log10Rb/Zr for the obsidian specimens. The reference samples are shown in the upper plot and the artefacts in the lower plot











#### Table 12. Results of discriminant function analysis for the obsidian artefacts

Predicted group membership

	1100	10100	giot	ip me		omp												
	Weta	Kaeo	Huruiki	Mayor Island	Fanal Island	Great Barrier Is.	Cooks Beach	Hahei	Tairua	Whangamata	Maratoto	Waihi	Taupo	Whakamaru	Rotorua	Lake Rotoiti	Maketu	Total
Original																		
Weta	14																	14
Kaeo		19																19
Huruiki			12															12
Mayor Island				25														25
Fanal Island					16													16
Great Barrier Is.						26												26
Cooks Beach							19	1			1				1			21
Hahei								21										21
Tairua									19									19
Whangamata			2							27								29
Maratoto											8							8
Waihi												11						11
Taupo													22					22
Whakamaru														4			2	6
Rotorua															8			8
Lake Rotoiti																14		14
Maketu																	6	6
Artefacts				8		7		1									-	16
				-														
Cross-validated																		
Weta	14																	14
Kaeo		19						-			-							19
Huruiki			12															12
Mayor Island			12	25	-	-	-		-			-		-	-	-		25
Fanal Island				20	16													16
Croat Barriar Is					2	24												26
Cooke Boach					2	24	10	1	_						1			20
							19	1							1			21
								21	10									10
	_		0	_	_	_	_		19	07		-		_	_	_		19
Whangamata			2							27	•							29
Maratoto	_			_	_	_	_		_		8			_	_	_		8
Waihi	_											11			_			11
Taupo													22					22
Whakamaru														4			2	6
Rotorua															8			8
Lake Rotoiti																14		14
Maketu																	6	6

Actual group membership

### MIDDEN ANALYSIS

Methodology and Sample Characteris- tics	A total of twelve 10 litre samples were collected from five midden sites (see Figure 113 for test pit locations in site R11/2379). Eight of the samples were analysed. All were wet sieved with a 1.5mm sieve. During this process the charcoal and fishbone were floated and separated. The samples were then air dried and sorted by hand into their main components and weighed. These components were defined as:
	Soil: fine sediment removed from the samples during sieving; includes clay, silt and sand sized particles.
	Unidentifiable shell: often highly fragmented but including largely complete shells with no hinge present.
	Identifiable shell: whole shells and shell fragments with an intact hinge.
	Rock: fragments of rock, burnt stone, pebbles, and sandstone.
	Charcoal: pieces of charcoal.
	Bone: bone fragments, specifically fish.
	Artefacts: objects created by human agency.
	The weight of each component for the samples is presented in Table 13, with the proportions represented graphically in Figure 114. This measure shows that in all samples the soil component made up the greatest portion by weight, for which the percentage ranged from 54.14% to 92.79% of the entire sample weight.
	The second largest component in all samples is the proportion of unidentifiable shell. Charcoal was recovered from each of the samples, although in very low quantities. Fish bone was generally not identified in these samples. One sample was found to have less than a gram of tiny, fragmented bone material.
	<u>R11/2378 Sample 1</u> was made up of 83.6% soil and 11.5% unidentifiable shell. This suggests a poor quality, sparse sample. This is reinforced by the fact that $3.3\%$ of the sample's weight was identifiable shell. Rock was also present in the sample (1.4%). Charcoal totalled less than 0.1% of the sample weight. No artefacts or bone were identified. The excavated section of R11/2378 was situated on the inland edge of the site and clearly had been modified by farming practices. Therefore as the sample was peripheral to the site more soil and less shell is likely to be found in the sample.
	<u>R11/2379 Test Pit 1</u> was made up of 54.7% soil and 37.8% unidentifiable shell. In this example there is less soil and significantly more unidentifiable shell, in fact the highest proportion of all the analysed samples. Identifiable shell made up 3.97% of the sample No artefacts or bone were identified. Charcoal made up just 0.06% of the sample.
	Continued on next page

### MIDDEN ANALYSIS, CONTINUED



## MIDDEN ANALYSIS, CONTINUED

Table 13. Sample components by Weight, in grams											
	R11/2378 Sample 1	R11/2379 TP1	R11/2379 TP4	R11/2379 TP5	R11/2379 Feature 131	R11/2953 Sample 1	R11/2955 Sample 1	R11/2955 Sample 2			
Soil	12309	4345	9971	10173	8061	10213	11623	4470			
Unidentified Shell	1696	3004	2450	1657	3253	569	1523	3088			
Identified Shell	494	315	258	147	780	65	159	277			
Rock	213	273	99	243	477	159	218	415			
Charcoal	<1	5	11	<1	<1	<1	<1	7			
Bone	0	0	0	0	<1	0	0	0			
Artefacts	0	0	15	0	0	1	0	0			
Total	14712	7942	12804	12220	12571	11007	13523	8257			


Figure 114. Sample component weight as a percentage of the total sample weight

Methodology<br/>and SampleR11/2379 Test Pit 4<br/>Ust 2% of the total weight was identifiable shell. Rock totalled 0.7% of the<br/>weight. No bone was identified. Charcoal and artefacts combined equalled<br/>0.2% of the sample weight. The artefact consisted of a small fragment of chert.<br/>This sample had the highest weight of charcoal and the lowest weight of rocks<br/>of all the samples analysed

<u>R11/2379 Test Pit 5</u> was made up of 83.2% soil and 13.5% unidentifiable shell. Just 1.2% of the total weight was identifiable shell. Rock totalled 2.0% of the weight. No bone was identified. Charcoal made up just 0.2% of the sample weight.

Methodology and Sample Characteris- tics, <i>continued</i>	<u>R11/2379 Feature (131)</u> was made up of 64.1% soil and 25.8% unidentifiable shell. Just 1.2% of the total weight was identifiable shell. Rock totalled 1.7% of the weight. No bone or artefacts were identified. Charcoal equalled 0.2% of the sample weight. This sample had the highest weight and proportion of identifiable shell and rocks of all the analysed samples.				
	<u>R11/2953 Sample 1</u> was made up of 92.8% soil and 5.1% unidentifiable shell. This was the sparsest of all the samples, with the highest proportion of soil present in the samples. Just 0.6% of the total weight was identifiable shell, which at just 65grams was the lowest weight identified overall. Rock totalled 1.4% of the weight. No bone was identified. Charcoal and artefacts combined equalled 0.01% of the sample weight. The artefacts consisted of a single, small chert flake.				
	<u>R11/2955 Sample 1</u> was made up of 85.9% soil and 11.2% unidentifiable shell. Identifiable shell made up 1.1% of the total weight, while rocks accounted for 1.6%. No bone or artefacts were identified. Just a single gram of charcoal was present.				
	<u>R11/2955 Sample 2</u> was made up of 54.1% soil and 37.4% unidentifiable shell. Identifiable shell made up 3.3% of the total weight, while rocks accounted for 5%. No bone or artefacts were identified. Charcoal weighed just 7 grams, or 0.08% of the sample.				
Sample Analysis	The identifiable shell portion was set aside for further analysis. Shells were sorted and analysed by taxon. Preferred habitat was also noted for further analysis. A list of all the taxa identified in the analysis is presented in Table 14.				
	The analysis of each taxon examined four aspects: the Number of Identified Specimens (NISP), the Minimum Number of Individuals (MNI), number and percentage, and weight (in grams).				
	NISP is calculated by counting the total number of identifiable shells for each species. For bivalves to be counted a hinge was the minimum requirement. For gastropods whole or nearly whole terminal spires were counted. For chitons the valves were counted.				
	MNI is calculated for bivalves by dividing NISP according to wether the hinge was left or right handed and the larger number taken as the MNI. For gastropods the MNI and NISP are identical. For chitons the terminal valves were counted and divided by two. The MNI percentage is calculated to show relative proportions.				
	Total weight for each species was calculated to the nearest gram.				
	The taxon analysis for each sample is presented in Table 15–Table 22.				
	Continued on next page				

Common Name	Scientific Name	Preferred Habitat
Cockle	(Austrovenus stutchburyí)	(Muddy environment)
Pipi	(Paphies australis)	(Muddy and/or sandy environment)
Tuatua	(Paphies subtriangulata)	(Sandy environment)
Mudsnail	(Amphibola crenata)	(Muddy environment)
Hornshell	(Zeacumantus lutulentus)	(Muddy environment)
Rock Oyster	(Saccostrea cucullata)	(Rocky environment)
Turret Shell	(Maoricolpus roseus)	(Muddy environment)
Cat's Eye	(Turbo smaragdus)	(Rocky environment)
Knobbed Whelk	(Austrofusus glans)	(Sandy environment)
Speckled Whelk	(Cominella adspersa)	(Sandy, rocky or muddy environment)
Paua	(Haliotis iris)	(Rocky environment)
Olive Shell	(Amalda australis)	(Muddy and/or sandy environment)
Scallop	(Pecten novaezelandiae)	(Sandy environment)
Oblong Venus	(Ruditapes largillerti)	(Sandy environment)
Gastropod sp.	(various unidentified gastropod species)	(Other / Unknown)
Operculum	(from various unidentified gastropod specie	es)

 Table 14. List of identified taxa by common and scientific names and preferred habitat

#### Table 15. NISP, MNI number and percentage, and weight by taxa for R11/2378 Sample 1

Taxon	<b>`</b>	NISP	MNI #	MNI %	Wt. G.
Cockle	(Austrovenus stutchburyi)	1263	601	96.8	465
Horn Shell	(Zeacumantus lutulentus)	4	4	0.6	<1
Mudsnail	(Amphibola crenata)	3	2	0.3	3
Scallop	(Pecten novaezelandiae)	3	1	0.2	1
Oyster	(Saccostrea cucullata)	33	6	1.0	21
Gastropod Sp.		6	6	1.0	1
Operculum		15	1	0.1	3

Taxon		NISP	MNI #	MNI %	Wt. G.
Cockle	(Austrovenus stutchburyi)	760	407	56.7	135
Pipi	(Paphies australis)	1	1	0.1	1
Cats Eye	(Turbo smaragdus)	19	10	1.4	5
Knobbed Whelk	(Austrofusus glans)	1	1	0.1	<1
Speckled Whelk	(Cominella adspersa)	8	5	0.7	9
Oblong Venus	(Ruditapes largillerti)	6	1	0.1	12
Olive Shell	(Amalda australis)	3	3	0.4	<1
Horn Shell	(Zeacumantus lutulentus)	17	9	1.3	<1
Mudsnail	(Amphibola crenata)	7	5	0.7	<1
Oyster	(Saccostrea cucullata)	15	1	0.1	9
Operculum		282	275	38.3	54
Gastropod Sp.		213	0	0.0	90

Table 16, NISP	P. MNI number and	nercentage, and	l weight by taxa	for R11/2379	Test Pit 1
	, which humber and	percentage, and	і псідії бу нала	101  K11/2577	I COL I IL I

#### Table 17. NISP, MNI number and percentage, and weight by taxa for R11/2379 Test Pit 4

Taxon	<b>^</b>	NISP	MNI #	MNI %	Wt. G.
Cockle	(Austrovenus stutchburyi)	1242	658	70.6	141
Tuatua	(Paphies subtriangulata)	13	6	0.6	3
Oyster	(Saccostrea cucullata)	1	1	0.1	0
Cats Eye	(Turbo smaragdus)	18	16	1.7	<1
Paua	(Haliotis iris)	1	1	0.1	22
Speckled Whelk	(Cominella adspersa)	6	1	0.1	4
Horn Shell	(Zeacumantus lutulentus)	21	13	1.4	3
Mudsnail	(Amphibola crenata)	35	23	2.5	19
Operculum		221	213	22.9	40
Gastropod Sp.		65	0	0.0	24

Taxon		NISP	MNI #	MNI %	Wt. G.
Cockle	(Austrovenus stutchburyi)	753	400	66.6	84
Tuatua	(Paphies subtriangulata)	17	13	2.2	0
Oyster	(Saccostrea cucullata)	1	1	0.2	5
Cats Eye	(Turbo smaragdus)	15	13	2.2	5
Speckled Whelk	(Cominella adspersa)	4	2	0.3	3
Horn Shell	(Zeacumantus lutulentus)	25	9	1.5	2
Mudsnail	(Amphibola crenata)	21	7	1.2	7
Operculum		164	156	26.0	28
Gastropod Sp.		52	0	0.0	18

#### Table 18. NISP, MNI number and percentage, and weight by taxa for R11/2379 Test Pit 5

#### Table 19. NISP, MNI number and percentage, and weight by taxa for R11/2379 Feature (131)

Taxon		NISP	MNI #	MNI %	Wt. G.
Cockle	(Austrovenus stutchburyi)	1021	527	89.8	539
Pipi	(Paphies australis)	11	8	1.4	<1
Cats Eye	(Turbo smaragdus)	1	1	0.2	<1
Knobbed Whelk	(Austrofusus glans)	4	2	0.3	58
Speckled Whelk	(Cominella adspersa)	11	5	0.9	12
Horn Shell	(Zeacumantus lutulentus)	1	1	0.2	<1
Mudsnail	(Amphibola crenata)	47	29	4.9	26
Scallop	(Pecten novaezelandiae)	104	9	1.5	122
Oyster	(Saccostrea cucullata)	31	5	0.9	23
Operculum		1	0	0.0	<1

Taxon		NISP	MNI #	MNI %	Wt. G.
Cockle	(Austrovenus stutchburyi)	212	110	83.3	41
Pipi	(Paphies australis)	3	2	1.5	<1
Speckled Whelk	(Cominella adspersa)	3	1	0.8	2
Horn Shell	(Zeacumantus lutulentus)	2	2	1.5	<1
Mudsnail	(Amphibola crenata)	1	1	0.8	<1
Scallop	(Pecten novaezelandiae)	1	1	0.8	1
Oyster	(Saccostrea cucullata)	1	1	0.8	<1
Operculum		14	14	10.6	2

#### Table 20. NISP, MNI number and percentage, and weight by taxa for R11/2953 Sample 1

#### Table 21. NISP, MNI number and percentage, and weight by taxa for R11/2955 Sample 1

Taxon		NISP	MNI #	MNI %	Wt. G.
Cockle	(Austrovenus stutchburyi)	227	114	49.8	60
Mudsnail	(Amphibola crenata)	12	9	3.9	10
Horn Shell	(Zeacumantus lutulentus)	10	8	3.5	5
Oyster	(Saccostrea cucullata)	18	7	3.1	23
Gastropod Sp.		102	0	0.0	40
Operculum		91	91	39.7	21

Taxon		NISP	MNI #	MNI %	Wt. G.
Cockle	(Austrovenus stutchburyi)	1030	600	50.6	132
Pipi	(Paphies australis)	48	17	1.4	7
Cats Eye	(Turbo smaragdus)	20	20	1.7	<1
Speckled Whelk	(Cominella adspersa)	37	12	1.0	12
Olive Shell	(Amalda australis)	1	1	0.1	<1
Horn Shell	(Zeacumantus lutulentus)	9	3	0.3	<1
Mudsnail	(Amphibola crenata)	15	9	0.8	5
Oyster	(Saccostrea cucullata)	16	5	0.4	16
Operculum		491	485	40.9	79
Gastropod Sp.		85	34	2.9	26

Table 2	2. NISP.	MNI numb	er and percent	age, and w	eight by tax	a for R11/295	5 Sample 2
I abit	<b>2. 11D1</b>	TALLAL HUILD	ci and percent	age, and m	cigne by tax		5 Sample 2

Taxon Cockles made up the largest proportions (both NISP and MNI) of shellfish species for all of the analysed assemblages. The variation between the samples Analysis rises over the extent to which it dominates. A system of 'types' was previously developed for understanding middens dominated by cockle and pipi (Farley 2011:55). This system was based on the variability of cockle and pipi proportions within the samples which divided samples into four 'types'. In this case a fifth type should be added which accounts for those samples where no one species greatly dominates:

> Type 1 is characterised by cockle comprising greater than 70% of the MNI.

Type 2 is characterised by pipi comprising greater than 70% of the MNI.

Type 3 is characterised by cockle comprising between 50% and 70% of the MNI.

Type 4 is characterised by pipi comprising between 50% and 70% of the MNI.

Type 5 is characterized by no single species comprising more than 50% of the MNI.

Types 1 and 2 indicate very strong selection for a certain shellfish species, whilst Types 3 and 4 indicate a more mixed preference. Type Five indicates a strong mixed selection.

Taxon Analysis, <i>continued</i>	Under this definition four of the eight samples would fall into Type 1 (R11/2378 Sample 1, R11/2379 Test Pit 4, R11/2379 Feature (131), and R11/2953 Sample 1).				
	A further three samples can be identified as Type 3 (R11/2379 Test Pit 1, R11/2379 Test Pit 5 and R11/2955 Sample 2).				
	None of the samples would fall into Types 2 or 4. These samples have very few if any pipi shells present.				
	One sample fits the Type 5 pattern. This is R11/2955 Sample 1, for which cockles comprise 49.8%, with gastropods (as calculated by operculum present) making up 39.7% of the sample.				
	Other species were noted to be present through all of the samples, but these were never counted in great quantities. These were predominantly various gastropod species, including mudsnails, various whelks, cats eyes. Others such as pipi, tuatua, scallop and oyster were all present in low numbers. Such a clear preference for cockle is in part a reflection of the ease of access to this species and the volume present in the local environment. Other factors such as taste preference may also contribute, although these are harder to quantify.				
Habitat Analysis	Given the location of study area, alongside a muddy estuarine environment, it is hardly surprising that the inhabitants were consuming local food resources. Rocky and sandy shore environments are also located in the wider area and would have been utilised. A point of interest is how these different environmental niches were made use of and how this may have changed over time.				
	To examine this the each species was separated in one of the following environmental niches:				
	Muddy Shore				
	Muddy and/or Sandy Shore				
	Sandy Shore				
	Rocky Shore				
	Sandy, Rocky or Muddy Shore				
	Other/Unknown.				
	The environmental niche associated with each species was presented in Table 14. The MNI of all species in each niche was then summed to provide the total MNI for each niche. The relative proportions for these niches are presented in Figure 115.				
	Continued on next page				

HabitatAn examination of this figure does show that muddy shore species account for<br/>at least 50% of the MNI in all the samples. The next largest group is the<br/>other/unknown grouping, which is the result of having significant numbers<br/>classified into either operculum or the catchall gastropod species group. It is<br/>considered likely that many of these would also fall into the muddy shore<br/>category if they were sufficiently whole to allow identification. An example<br/>species would be mudsnails.

The dominance of the muddy species shows that the local riverine resources were the primary source of the shellfish with other shellfish being brought in from the nearby harbour.





**Fragmentation** A fragmentation ratio was calculated to assess the level of fragmentation. The reasoning for this follows the argument that greater quantities of broken shells indicate greater levels of damage to the deposit. Therefore greater quantities of intact shells would indicate a deposit in 'good/whole' condition. Interpretation of this ratio needs to take into account various taphonomic factors influencing the site, such as the level of plough damage, cattle trampling or vehicle movements across the site, or even environmental factors such as chemical weathering.

In order to calculate the ratio the identifiable shells were separated into those with over 50% of the shell intact and those with less than 50%. Only cockle were counted as other species lacked sufficient numbers. The MNI of each portion was calculated and the less than 50% portion was divided by the greater than 50% portion. This creates a ratio of broken shells to whole shells, with a higher number indicating more broken shells. The MNI numbers of each sample and the ratio is presented in Table 23 and Figure 116.

Comparison between samples shows that R11/2379 Test Pit 4 was the most heavily fragmented, followed fairly closely by R11/2955 Sample 2 and R11/2379 Test Pit 5. These samples all returned ratios between 22 and 28, indicating quite highly fragmented samples.

While none of the samples could be described as having low ratios, three samples stand out as having low to moderate ratios: R11/2378 Sample 1, R11/2379 Feature 131 and R11/2955 Sample 1.

None of the samples could be described as in great condition, and when taking into account the sparse quantity of shell in the samples, the high levels of unidentifiable shell, the general lack of charcoal and bone, and the overall high fragmentation ratios, these samples demonstrate that a great deal of damage was done to them. A lot of this damage is likely to have been the result of farming activities in the areas around the sites over the past 150 years.

Sample	450% MNI #	>50% MNI #	Ratio
R11/2378 Sample 1	540	61	8.85
R11/2379 TP1	384	23	16.70
R11/2379 TP4	636	22	28.91
R11/2379 TP5	383	17	22.53
R11/2379 Feature 131	455	72	6.32
R11/2953 Sample 1	102	8	12.75
R11/2955 Sample 1	100	14	7.14
R11/2955 Sample 2	577	23	25.09

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Figure 116. The <50% to >50% cockle fragmentation ratio for each sample

Shell Shell dimension is a variable that can reveal changes in the levels of predation over time. A dense occupation over a considerable period of time could harvest a particular species with great enthusiasm and thereby reduce the size of the individuals available to little more than juveniles. Conversely a targeted harvest conducted by individuals moving quickly across the landscape may select simple the largest available individuals.

A sample of complete cockle shells was measured. Sub-samples of complete shells were separated from the >50% complete portions and a measurement, in millimetres, was made of the maximum dimension of each shell. Only those samples with at least 100 complete shells were analysed, which meant that just two of the eight samples were suitable for analysis.

Descriptive statistics for maximum dimensions are presented in Table 24, with individual sample histograms in Figure 117 and Figure 118. The smallest mean (23.81mm) came from R11/2378 Sample 1, while the largest mean (27.68mm) came from R11/2379 Feature (131).

Unfortunately, without a greater number of samples for comparison there is little to conclude from this analysis except that the shell material from R11/2379 Feature (131) displays a larger mean dimension than that from R11/2378 Sample 1.

 Table 24. Maximum cockle dimension mean, median, mode and standard deviation, in mm

Sample	Count	Mean	Median	Mode	Standard Deviation
R11/2378 Sample 1	100	23.81	23.5	19	5.33
R11/2379 Feature 131	100	27.68	27.35	28.44	3.76





Figure 117. R11/2378 Sample 1 maximum cockle dimension histogram (Skewness = 0.142)

Figure 118. R11/2379 Feature 131 maximum cockle dimension histogram (Skewness = 0.172)

## **CHARCOAL ANALYSIS**

All analysed bulk midden samples were wet sieved through a 1.5mm mesh. Sample Collection During this process charcoal and other organic material floated to the surface. This material was then air dried and dry sieved. The remaining portion was then examined and modern vegetation material subsequently removed from the sample. Many of the samples were found to contain only a tiny quantity of charcoal, and much of this was very highly fragmented. Three samples with the greatest total weight were selected for specialist analysis, R11/2379 F92, R11/2379 F129, and R11/2379 F36, all from fire scoops. This analysis was conducted by Dr Rod Wallace at the University of Auckland. The samples were used to identify the range of firewood used and therefore provide information regarding the local environment. Only a few of the fragments were able to be identified, with just 66 identified Results pieces across all three samples. The breakdown of identified pieces by sample is presented in Table 25, with a graphical presentation of the relative proportions of plant types given in Figure 119. The following analysis of the results was provided by Dr Rod Wallace in his report (Wallace 2014). All the charcoal samples are from firescoops and so must have originated from firewood collected from the local landscape during prehistoric occupation. The samples are too few and small to provide a proper palaeo-botanical analysis. Despite this all the charcoal present was from tree species which are dominated by Puriri accompanied by Rewarewa and Matai, which suggests the vegetation in the immediate area at the time the sites were occupied was probably intact bush. All three of the firescoops from which charcoal was extracted were dated. Feature (36) returned a date approximately 100 years earlier than the remaining dates from the project (see next section). That particular feature contained charcoal from both the Puriri and Rewarewa trees, both broadleaf species that contributed to the view that the vegetation was intact bush. It appears that the occupation at that time did not entirely reduce the bush cover, as these broadleaf species were still present during the later occupation.

# CHARCOAL ANALYSIS, CONTINUED

Table 25. Summary of plant species identified by charcoal analysis							
Common Name	Scientific Name	Habitat	R11/2379 F92	R11/2379 F129	R11/2379 F36	Total	
Puriri	Vitex lucens	Broadleaf trees	15	21	20	56	
Rewarewa	Knightia excelsa	Broadleaf trees			1	1	
Matai	Prumnopitys taxifolia	Conifers	9			9	
Total			24	21	21	66	
Weight (gms)			211	375	196		

Tabl 25 G .



Figure 119. Relative proportions of plant type based on counts totalled across all analysed samples

# **RADIOCARBON DATING ANALYSIS**

Samples	A total of seven samples were submitted to the University of Waikato Radiocarbon Dating Laboratory for analysis. Four samples of estuarine shell ( <i>Austrovenus stutchburyi</i> ), and three samples of charcoal ( <i>Knightia excels</i> , <i>Prumnopitys taxifolia</i> , and <i>Vitex lucens</i> ) were submitted. The shell material consisted of sub-samples extracted from the bulk midden samples analysed from three sites (R11/2378, R11/2379, and R11/2955). These were washed prior to submission to remove the bulk of silt adhering to the surface. The charcoal material was extracted from bulk samples collected from firescoop features recorded as part of R11/2379 (Figure 120). All of the charcoal dates were analysed by Accelerator Mass Spectrometry. Following submission the shells were then subjected to both physical and chemical pre-treatments within the lab. The detailed lab reports are presented within Appendix C, and the sample results are examined below.
Results	The seven submitted samples returned results (Table 26) that place the activity around the Timberly Road project area across a very broad time band stretching from around 1450AD up into the 1800s AD (Figure 121). There is one outlier result which dates from the 1300s. This result came from a lone hearth situated just to the south of the main settlement at R11/2379.
Discussion	When compared with previous radiocarbon results collected from the wider Mangere area a pattern of regular and longstanding use of this environment becomes apparent (Figure 122 and Figure 123). Most of the archaeological sites examined in this area appear to have been relatively short term camps and/or food processing sites, which were only occupied for what appears to be short phases before abandonment and occupation of a new location. Other locations, such as the NRD site (R11/859) revealed distinct successive occupations of the same location over the course of several hundred years. The radiocarbon dates for R11/2379 suggest a pattern of occupation and reuse over the course of approximately 100 years in the 1500s, running roughly contemporary with the occupation of R11/2378. One date collected from the main midden deposit (Feature 1) at R11/2379 provides a broad date from the mid-1600s up to the modern period, suggesting that use of this area may have continued into the 1800s.
	The early date, from Feature 36, indicates some, probably low density, occupation from the 1300s onwards.

Figure 120. Map showing the location of radiocarbon dates from the Timberly Road project



#### Table 26. Timberly Road radiocarbon dates

	Material	Raw	Error	Site	Feature	-1σ	1σ	-2σ	2σ
Wk40915	Charcoal	604	20	R11/2379	Feature 36	1320	1420	1320	1430
Wk40916	Charcoal	420	20	R11/2379	Feature 92	1450	1610	1450	1620
Wk40917	Charcoal	396	21	R11/2379	Feature 129	1460	1620	1450	1630
Wk40793	Shell	727	19	R11/2378	Sample 1	1524	1635	1480	1668
Wk40792	Shell	726	23	R11/2379	Feature 131	1524	1636	1480	1670
Wk40794	Shell	658	30	R11/2955	Sample 1	1567	1760	1503	1803
Wk40791	Shell	564	32	R11/2379	Feature 1	1677	1816	1641	1950



Continued on next page





Figure 123. Location of radiocarbon dates in the Timberly Road and wider area

## **INTERPRETATION AND DISCUSSION**

**Discussion** The features excavated at R11/2379 suggest a small hamlet located on the headland dating to the late 15th to mid-16th century. It contained numerous structural features (houses, pits, fire scoops, post and stake holes), and differed in this respect from the other sites investigated (R11/2378, R11/2953 and R11/2954) which generally lacked these structural features and are interpreted as shellfish processing locations.

R11/2955 appears to have been different again, in that there were several small stakeholes, possibly forming a windbreak or small shelter and a single fire scoop, but with several artefacts, possibly indicating a short-term camp.

The range of features at R11/2379 suggests that a number of activities were carried out on the site. The activities appear to have included:

- •Fish and shellfish processing and drying;
- •Small living areas; and
- •Food storage.

Cockle dominated the midden, followed by a range of gastropod species. The majority of the shellfish would have been easily accessible from the muddy shore environment of the coast. Fish are likely to have been a component of the diet, although only a tiny number of bones were recovered and these were too fragmented to be identified.

Two types of fire scoops were identified among the 10 fire scoop features present. These were either circular scoops with sloping sides or rectangular with vertical sides. The types were also spatially clustered, with the circular features present at the main midden area, and the rectangular features around the houses and drying racks. One of the circular fire scoops was dated to the 1300s, pre-dating the other dated deposits from the rest of the excavation by over 100 years.

The 15 pits were primarily large rectangular features arrayed around a northeasterly aspect, with internal and external drains to assist in the removal of water. The largest measured 5530 x 2070 mm and the deepest, a bin pit, was 630mm deep, though most of the pits were significantly truncated. The deep rounded bin pit was similar to those reported from the NRD archaeological excavations (Campbell 2011), known as rua kopiha. The fill of the pits was for the most part relatively homogenous natural silt accumulation, but some, particularly the bin pits, were filled in layers and two of the pits were deliberately infilled. There is a slim possibility that these pits related to the same early occupation and the outlier fire scoop.

Discussion, continued	Three groupings of postholes were identified as houses. The largest of these measured 5.1m by 4.4m and was positioned near the top of the small knoll around which the site was arrayed. The other houses were positioned down the slope to the north of this structure, and each was successively small than the last. House 3, the smallest, was also the best preserved with some post and slot holes present. All of these features were filled with a light grey silt, indicating that either the posts had rotted away in position following abandonment or that they were demolished and silt accumulated in the holes by natural processes.
	Other postholes have been interpreted as drying racks for use in the preservation and preparation of various seafoods.
	The charcoal samples from the fire scoops suggested that the area was probably relatively intact bush during the main phase of occupation. Puriri, Rewarewa and Matai were all present at the site as firewood.
Maori Artefacts	The artefact assemblage comprised 37 individual artefacts, 26 from R11/2379, 10 from R11/2955 and one from R11/2953. The artefacts were predominantly obsidian (n = 25), with smaller amounts of both chert (n = 8) and fine-grained stone (n = 4), including flakes, fragments (broken or incomplete flakes), a manuport, a single potential tool and a single core. The assemblage from R11/2379 provides further evidence for a variety of occupational activities at the site, with obsidian used for possible butchering and manufacturing tasks, chert used as a tougher alternative to obsidian and for drill points, and the fine-grained lithic material likely to have been related to adze use. Sixteen of the obsidian artefacts from Timberly Road were sourced using XRF analysis and this revealed the material originated from three sources: eight pieces came from Mayor Island, seven from Great Barrier Island and one from Hahei.
3D Reconstruction	A 3D reconstruction of site R11/2379 was undertaken using the contour data and the GIS spatial information relating to the archaeological features. Features within the site were treated as contemporary, although this is unlikely to have been the case since we know that at least one fire scoop was utilized around a century prior to most of the others. These images are displayed in Figure 124 to Figure 129.
	Figure 123 is an elevated view from the north of the site, facing towards the southeast showing the arrangement of the site as a whole. This also displays the functional divisions, with housing at the north, food storage taking advantage of the northeasterly aspect immediately behind this, and finally the main shellfish preparation and cooking area.
	Figure 124 is an elevated view from a position slightly west of the southern midden looking to the northeast. This view focusses on the pit layout, with these large pits arranged in a roughly parallel layout.

3D Reconstruction, continued	Figure 125 is an elevated view from a point slightly east of House 3 and shows the house cluster, with a number postholes not assigned to any specific structure visible around these. Some of these may have related to windbreaks or drying racks or even raised platforms. An example of a drying rack with fires for smoking any consumables is indicated.				
	Figure 126 shows a cut-away view of a possible reconstruction of House 1. In this example the house opens to the south with a small porch. A similar layout can also be presented, with a porch opening to the north.				
	Figure 127 is a view facing northwest showing a cut-away view of a possible reconstruction of House 2. In this example the house opens to the south, with a porch present. A small drying rack is displayed just to the west of the house, with a square fire positioned just beyond this.				
	Figure 128 is a view facing southeast showing a cut-away view of a possible reconstruction of House 3. In this example the house opens to the north, and has no porch present. Positioned nearby are a large drying rack and two rectangular fire scoops.				
European Occupation	A rectangular timber structure, R11/2956, has been tentatively identified as a timber lined well. The structure measured 1.5m by 1.5m and was a minimum of 1.12m deep. Much of the timber utilized in its construction was recycled material, with skirting boards present. This feature is probably of either late 19th century or early 20th century date. A number of 19th century artefacts were collected from within the structure, and also from further up the gully indicating use of this area during that period, probably for rubbish tipping.				
	A number of artefacts of European origin were recovered, including objects in glass, ceramic, metal and brick. Nineteen pieces of glass were found to relate to just 6 bottles. These were primarily alcohol related (beer, gin and whisky), with one pharmaceutical bottle present.				
	Sixty-one pieces of ceramic were recovered, and these related to 33 objects. The ceramic items were primarily kitchen/dining focused, with multiple cups, saucers, and plates along with jugs and tureens. Fragments of a chamber pot were also noted, along with a couple of decorative items such as a vase and a kiwi sculpture.				
	Nine metal objects were recovered. These related more to the functioning of the land as a farm, with items like horseshoes, hitches and straps recovered. A modern shotgun shell was also present.				
	Two bricks were recovered during the stripping activity. These were manufactured via either the extrusion or wire-cut process.				



Figure 124. A 3D reconstruction of R11/2379 with a view facing southeast showing a possible interpretation of the site (yellow = midden, purple = drains, orange = fire scoops, green = pits). Images created by Thomas MacDiarmid



Figure 125. A 3D reconstruction of R11/2379 with a view facing northeast showing a possible interpretation of the site



Figure 126. A 3D reconstruction of R11/2379 with a view facing southwest showing a possible interpretation of the site



Figure 127. A 3D reconstruction of R11/2379 with a view facing north showing a possible interpretation of House 1

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Figure 128. A 3D reconstruction of R11/2379 with a view facing northwest showing a possible interpretation of House 2



Figure 129. A 3D reconstruction of R11/2379 with a view facing southeast showing a possible interpretation of House 3 and a drying rack

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**European** Occupation, *continued* Historic research has indicated the use of this property as a farm from the middle of the 19th century right up until the time of the development and these items relate to the use and occupation of the land during that time. The household items point to the presence of a homestead in relatively close proximity. This has been confirmed by examination of historic photographs going back to 1920. However the area of that structure was heavily modified during the late 2000s, although it does not appear to have been recorded by anyone archaeologically. The artefacts would have been related to one or more of the families who owned the property between the 1860s and 1920s (the Nicholls, Wyman, Howard and Cox families – see Historical Background).

# WiderNumerous archaeological surveys and investigations have been carried out in<br/>the Mangere area, where many significant archaeological sites are located.<br/>Many of the recorded sites have been dated to periods that are broadly<br/>contemporaneous with the Timberly Road sites, and some also have<br/>indications of earlier settlement phases.

Some of the most significant sites were those located on the volcanic cones and craters present in the area. In the 1970s excavations were carried out on Maungataketake/Elletts Mountain, a significant pa, before it was quarried away for airport development. Stone faced terraces, pits and living platforms were excavated (McKinlay 1974; 1975), but a detailed investigation report has never been written. The archaeology indicated at least two phases of occupation, one of which is of a potentially early date (Robert Brassey, pers. comm. to M. Campbell, cited in Campbell 2011).

Mangere Mountain is one of the largest of the Auckland volcanic cone pa, and there were also major pa on Puketutu Island prior to quarrying. The island was mapped in detail in advance of proposed quarry rehabilitation works, and still retains many sites relating to Maori occupation as well as stone walls and other heritage features relating to early European farming (Clough et al. 2008; Gallagher et al. 2009; Veart 1994).

Another significant feature derived from the volcanic landscape is the stonefields. The Otuataua fields have been extensively studied (e.g. Clough & Plowman 1996; Veart 1986), and are now protected in a Historic Reserve. The stonefields contain numerous surface stone features relating to Maori gardening, such as walls, rows and alignments, which served to divide the landscape and to demarcate garden boundaries; stone and earth mounds for growing kumara and other plants; and stone walled house sites and stone edged terraces indicating habitation within the gardening areas.

Extensive stonefields similar to Otuataua were archaeologically investigated at Puhinui (R11/25) surrounding Matukutureia (McLaughlins Mountain) ahead of the southwestern interceptor sewerage pipeline installation (Lawlor 1981; Clough & Turner 1998). This provided evidence of Maori gardening methods,

Widerfood remains, and field shelters used for temporary habitation. OtherArchaeologicalfood remains, and field shelters used for temporary habitation. OtherContext,some cases surface features proved on investigation to be natural (Lilburncontinued1982; Brassey & Adds 1983).

Away from the relatively dense habitation and gardening sites associated with the volcanic areas other sites relating to small villages and even smaller camps have been examined. During development of the eastern approach to the airport, excavations were carried out at Papahinu (R11/229) on the Pukaki Creek. This was known as an early 19th century Maori settlement. At least 14 houses and an associated area of large kumara storage pits (R11/1800) were uncovered (Foster and Sewell 1995). The settlement was abandoned in the 1820s in response to attacks from Ngapuhi, and reoccupied from the mid-1830s until 1863, when Te Akitai departed to the Waikato (Sullivan 1973; Foster and Sewell 1995: 15, 56; Campbell 2011). There was also evidence of earlier occupation, with a shell midden layer dated to AD 1450–1690.

Extensive investigations were undertaken in 2008-9 as part of the Northern Runway Development for Auckland International Airport Limited (Campbell 2011). These excavations recorded nine areas of archaeological interest near the southern end of the runway, with a diversity of features ranging from pits and postholes through to dense midden covering multiple pit and house features, and numerous artefacts. A large number of burials (88) were also uncovered. Eleven radiocarbon age determinations were made from across the areas, many of which were broadly similar and indicated occupation dates of the 1600s and early 1700s (ibid: 153).

In 2005 during Stage 1 of The Landing development on the western side of George Bolt Drive (accessed from Landing Drive), an investigation of the historic Westney Homestead was carried out (Campbell and Furey 2007). The homestead dates from 1855. In areas surrounding the house, subsurface features and midden relating to earlier Maori occupation were also encountered. Two further midden deposits were uncovered during Stages 2B (Farley and Clough 2014b) and 3A (works ongoing) of The Landing development, both of which returned radiocarbon dates spanning the period 1400-1600 AD.

The smaller sites uncovered within the Timberly Road development are placed firmly within the grouping of temporary camps, primarily comprising midden, which are so often found. Site R11/2379 is a somewhat more substantial settlement, and fits within the group of hamlet type settlements which are identified less commonly. Each hamlet was probably part of a series of such settlements spread across the landscape which formed the local community, with social attention drawn back to the marae and central habitation location.

**Conclusions** The results presented here represent a small but valuable contribution to the archaeology of the Mangere area. Site R11/2379 appears to have been a relatively short-term settlement that was organized around the various functions required for settlement: habitation, storage and food preparation. When placed within the wider context of archaeological sites in the local landscape this site, and the other smaller sites, add to the richness of the archaeological story of settlement and the ongoing occupation of the land.

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MapColl-832.12gbbd/[186-]/Acc.427, WC-011

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#### Births, Deaths and Marriages:

BDM 1862/4209 and 1862/4450

#### **CHI Record Forms:**

4522

#### Land Information New Zealand:

DP 13909, DP 188195, DP 196235, SO 1340C, SO 69355,

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# **APPENDIX A: SITE RECORD FORMS**



#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: R11/1359
Site description	
Updated: 26/11/2012, Visited: 22/11/2012 - NZTM E17 survey with GPS coords collected. Site appears quite s Inspected by: Farley, Glen.	60018 / N5905037 (Handheld GPS). Site visited during recent field small, some 3m in diameter and less than 5cm in thickness.
Condition of the site	
Updated: 26/11/2012, Visited: 22/11/2012 - Damage fr	om cattle trampling and erosion of the scarp.
Statement of condition	
Updated: 29/05/2013, Visited: 22/11/2012 - Fair - Some	e intact features, but others may be unclear or damaged
Current land use:	
Threats:	

Printed by: rodclough

22/09/2014

2 of 5

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ervations about	this site made in	n		
Author	Year	Title	Publication Deta	ails
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		075	HER	
Orid References 1 1. Aids to rel	Rasting	Northing		
10000 (00000000000000000000000000000000		n a- Marian Milia da Milia da C		
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3. Description	of site (Supply f	ull details, history	local environment, references	
sketches, etc.	If extra sheets an	re attached, include a	summary here)	
NOT relocated	2006. Foster i	n 2004 only saw 1	m long seam of midden	
		NAME OF CONTRACTOR		
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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION



## NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

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<ol> <li>State of site and possible future damage The mite is cattle damage.</li> </ol>	eroding and constantly subject to
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#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

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Grid reference (E1760067 / N5905074)	visited 23/02/2014 by Paney, Glen
Terrace, measuring c. 15 x 5m, is as previously described. Si Molloy, upon advice from Glen Farley.'	te is protected in the coastal buffer. Updated by Nicola
Condition of the site	
Statement of condition	
Updated: 19/09/2014, Visited: 22/02/2014 - Fair - Some intact	features, but others may be unclear or damaged
Current land use:	
Updated: 19/09/2014, Visited: 22/02/2014 - Coastal margins	
Threats:	
Printed by: rodclough	22/09/2014

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#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

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CFG Heritage Date 25 OCT 2006 Auckland mords and Register of Archaeological Sites (for office use) te Field Code Type of site Longitude 8 Type of site Longitude 8 Type of site Longitude 8 Longitude 9 Longitude 9 Long	6. Reported by L. Furey	Filekeeper	NZAA Filekoona	
Nords Auckland Auckland and Register of Archaeological Sites (for office use) te Field Code Longitude 8 Type of site Longitude 8 Longitude	Address CFG Heritage	Date U	2 5 OCT 2006	
and Register of Archaeological Sites (for office use) te Field Code  Longitude 8  Type of site Present condition & future danger of destruction Local environment today Security code Land classification Local body	7. Key words		Auckland	
Longitude 8 Type of site Present condition & future danger of destruction Local environment today Security code Land classification Local body	8. New Zealand Register of Archaeological	Sites (for office :	use)	
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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION



#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM (NZMS260) NZMS 260 map number Rl1 NZMS 260 map name Auckland NZMS 260 map edition lst	NZAA METRIC SITE NUMBER E11/1360 DATE VISITED 31.10.83 SITE TYPE TETRACO SITE NAME: MAGRI OTHER
Grid References Easting 2 6 7 0 5	Northing 6,4 6 5 7
1. Aids to relocation of site (attach a sketch map) On easte	ern of two small twin headlands 58
of Hr Cameron(senior)'s house. See attached	f location map and sketch.
2. State of site and possible future damage Under grass, g	gmazed by cattle
4. Owner Cameron Tena Address Westney Rd Addr Hangere	nt/Manager ess
4. Owner     Cameron     Tenar       Address     Westney     Rd       Hangere     Hangere   5. Nature of information (hearsay, brief or extended visit, etc.) Photographs (reference numbers, and where they are held) Aerial photographs (reference numbers, and clarity of site)	nt/Manager ess brief visit
4. Owner     Cameron     Tenal       Address     Westney Rd     Address       Mangere     Hangere     Address       5. Nature of information (hearsay, brief or extended visit, etc.)     Photographs (reference numbers, and where they are held)       Aerial photographs (reference numbers, and clarity of site)     Aerial photographs (reference numbers, and clarity of site)       6. Reported by: Foster & D.Johns     Flieke       Address     c/o Anthropology Dept     Date       University of Auckland     Date	nt/Manager ess brief visit eeper S. BULMER
4. Owner     Cameron     Tenal       Address     Westney Rd     Address       Mangere     Hangere     Address       5. Nature of information (hearsay, brief or extended visit, etc.)     Photographs (reference numbers, and where they are held)       Aerial photographs (reference numbers, and clarity of site)       6. Reported by: Foster & D. Johns     Fileka       Address     c/o Anthropology Dept     Date       University of Auckland     Terrace	nt/Manager ess brief visit eeper S. BULMER
4. Owner       Cameron       Tenal         Address       Westney Rd       Address         4. Owner       Generon       Tenal         Address       Westney Rd       Address         5. Nature of information (hearsay, brief or extended visit, etc.)       Photographs (reference numbers, and where they are held)         Aerial photographs (reference numbers, and clarity of site)       Aerial photographs (reference numbers, and clarity of site)         6. Reported by: Foster & D. Johns       Filek         Address       c/o Anthropology Dept       Date         University of Auckland       Date         7. Key words       Terrace         8. New Zealand Register of Archaeological Sites (for office use)       NZHPT Site Field Code	nt/Manager ess brief visit eeper S. BULMER
4. Owmer       Cameron       Tenal         Address       Westney Rd       Addr         Address       Westney Rd       Addr         5. Nature of information (hearsay, brief or extended visit, etc.)       Photographs (reference numbers, and where they are held)         Aerial photographs (reference numbers, and clarity of site)       Aerial photographs (reference numbers, and clarity of site)         6. Reported by:       Foster & D., Johns       Filek         Address       c/o Anthropology Dept       Date         University of Auckland       Date       Date         7. Key words       Terrace       S.         8. New Zesland Register of Archaeological Sites (for office use)       NZHPT Site Field Code         Latitude S       Longitude E       B         A. Type of site       B       C         A. Type of site       B       C	nt/Manager ess brief visit eeper S. BULMER

	Continued on next page
	6 of 6
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### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: R11/1361
Site description	
Condition of the site	
Statement of condition	
Current land use:	
Threats:	

SITE RECORD INVENTORY	NZAA SITE NUMBER: R11/1361
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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM (NZMS260) NZMS 260 map number NZMS 260 map name Aud::land 1st	ETRIC SITE NUMBER R1171361 SITED 31.10.03 E Depression ME: MADRI OTHER
Grid References Easting 2,6 7,0 3	
<ol> <li>Aids to relocation of site (attach a sketch map) SE of Cameron's ( headland. See attached map.</li> </ol>	senior) house on large
2. State of site and possible future damagetinder grass, grazed by c	attle.
neasures 6 x 5m x approx 40cm deep. No associat	ed features.
4. Owner Cameron Tenant/Manager Address Veatney Rd Address Dangere	
4. Owner Cameron Tenant/Manager Address Vestney Rd Address     5. Nature of information (hearsay, brief or extended visit, etc.) brief vis     Photographs (reference numbers, and where they are heid)     Aerial photographs (reference numbers, and clarity of site)	it
4. Owner     Cameron     Terunt/Manager       Address     Westney Hd     Address       5. Nature of information (hearsay, brief or extended visit, etc.)     brief vis       Photographs (reference numbers, and where they are held)     Aerial photographs (reference numbers, and clarity of site)       6. Reported by?. Foster & D. Johns     Filekceper       Address     c/o Anthropology Dept     Date	ait S AUM MER HAE I
4. Owner       Cameron       Tenant/Manager         Address       Vestney Rd       Address         5. Nature of information (hearsay, brief or extended visit, etc.)       brief vis         Photographs (reference numbers, and where they are held)       Aerial photographs (reference numbers, and clarity of site)         6. Reported by?.Foster & D. Johns       Filekceper         Address       c/o Anthropology Dept       Date         University of Auckland       To words         8. New Zealand Register of Archaeological Sites (for office use)       NZHPT Site Field Code	nit S. PLU MER Ya M. T
4. Owner       Cameron       Tenant/Manager         Address       Vestney Rd       Address         S. Nature of information (hearsay, brief or extended visit, etc.)       brief visit         Photographs (reference numbers, and where they are held)       Aerial photographs (reference numbers, and clarity of site)         8. Reported by?.Foster & D.Johns       Filekcesper         Oddress       c/o Anthropology Dept       Date         University of Auckland       7. Key words         8. New Zealand Register of Archaeological Sites (for office use)       NZHPT Site Field Code         Latitude S       Longitude E	ait · PLUMER PRE 1
4. Owner       Cameron       Tenant/Manager         Address       Vestney Rd       Address         5. Nature of information (hearsay, brief or extended visit, etc.)       brief vis         9. Nature of information (hearsay, brief or extended visit, etc.)       brief vis         Photographs (reference numbers, and where they are held)       Aerial photographs (reference numbers, and clarity of site)         6. Reported by?. Foster & D. Johns       Filekceper         Address       c/o Anthropology Dept       Date         University of Auckland       Date         7. Key words       8. New Zealand Register of Archaeological Sites (for office use)         NZHPT Site Field Code       Longitude E         Address       Longitude E	nit 
4. Owner       Cameron       Tenant/Manager         Address       Vestney Rd       Address         Jangere       Address       Address         5. Nature of information (hearsay, brief or extended visit, etc.)       brief vis         Photographs (reference numbers, and where they are held)       Aerial photographs (reference numbers, and clarity of site)         6. Reported by?.Foster & D.Johns       Filekesper         Address       c/o Anthropology Dept       Date         University of Auckland       Date         7. Key words       S. New Zealand Register of Archaeological Sites (for office use)         NZHPT Site Field Code       Longitude E         A.M.       Type of site       Security code	ait c cliff MER t p t t

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	4 of 4
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#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: R11/2378
Site description	
Updated 08/09/2014 (Field visit), submitted by rodclough , v Grid reference (E1759931 / N5904881)	isited 12/02/2014 by Farley, Glen
A portion of this site was effected by works undertaken for an	n industrial subdivision under Authority No. 2014/573.
The site measures approximately 30m NS by 25m EW, with t Midden was found to extend up to 6m north of the limit of wo be fairly thin, having probably been spread by farming practic	the majority of this protected in the coastal buffer reserve. rks. This material was recorded and sampled, and was noted t ces such as ploughing.'
Condition of the site	
Surface heavily disturbed by stock trampling and possibly by bank. Area probed to determine extent of midden. Shell lens	ploughing in the past. Some slumpage near the edge of the probably c.100mm in thickness. (2006)
Statement of condition	
Updated: 19/09/2014, Visited: 10/02/2014 - Fair - Some intac	t features, but others may be unclear or damaged
Current land use:	
Updated: 19/09/2014, Visited: 10/02/2014 - Grazing	
Threats:	
Updated: 19/09/2014. Visited: 10/02/2014 - Stock trampling.	Erosion

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#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

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ervations about this site made in				
Author Year Title		Public	ation Details	
porting documentation held in ArchSite				
NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM (NZMS260) NZMS 260 map number NZMS 260 map name NZMS 260 map edition	NZAA METRIC SITE DATE VISITED SITE TYPE SITE NAME: MAORI OTHER	NUMBER 811/2363	2378 GU	
Aids to relocation of site (affach a sketch map)	5 .6 . Norming .6 .4	0 0 5 7.4.		
See attached map. Located on North bank of Tautauroa Creek, Grid reference taken with handheld GPS, ad	c.200m West of cr ccuracy +/- 7 metr	eek mouth. 98.		
<ol> <li>State of site and possible future damage Surface heavily disturbed by stock trampli in the past. Some slumpage near the edge of</li> </ol>	ing (presently cow of the bank.	s)and possibly by p	loughing	
<ol> <li>Description of site (Supply full details, history, local et attached, include a summary hare)</li> <li>Site visible as an exposure of midden in a Currently under pasture and actively stock (Austrovenus stutchburyi). Area probed to di</li> </ol>	nvironment, references, : 15m radius from red. Midden compri etermine extent of	ketches, etc. If extra shee the edge of the enh sed of crushed cock midden. Shell lens	is are ankment. le shell probably	
about 100mm in thickness. No other signs of Although farm practices such as ploughing a are likely to have obscured any features f Tautauroa Creek is part of a tidal mangrove	prehistoric occupa und other activitie such as pits or te swamp, that drain	tion visible on the es, along with stock rraces. Is into the Manukau	surface. : damage, Harbour.	
about 100mm in thickness. No other signs of p Although farm practices such as ploughing a are likely to have obscured any features of Tautauroa Creek is part of a tidal mangrove 4. Owner Address	Tenant/Manager Address	tion visible on the se, along with stock rraces. is into the Manukau	surface. : damage, Harbour.	
about 100mm in thickness. No other signs of J Although farm practices such as ploughing a are likely to have obscured any features of Tautauroa Creek is part of a tidal mangrove 4. Owner Address Auckland Airport 5. Nature of information site survey (visual inspection and probing) Photographs (reference numbers and where they are hald) Aerial photographs (reference numbers and clarity of	Tenant/Manager Address	tion visible on the se, along with stock erraces. Is into the Manukau	Burface, : damage, Harbour.	
about 100mm in thickness. No other signs of J Although farm practices such as ploughing a are likely to have obscured any features r Tautauroa Creek is part of a tidal mangrove 4. Owner Address Auckland Airport 5. Nature of information site survey (visual inspection and probing) Photographs (reference numbers and where they are held) Aerial photographs (reference numbers and clarity of site) 6. Reported by Jaden Harris & Noel Hill Address C/O CFG Heritage, P.O Box 10 015, Dominion Rd. Auckland.	Tenant/Manager Address	NZAA Fileke	eper 1	
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about 100mm in thickness. No other signs of J Although farm practices such as ploughing a are likely to have obscured any features r Tautauroa Creek is part of a tidal mangrove	Filekeeper Date	NZAA Fileke	eper 06	
about 100mm in thickness. No other signs of J Although farm practices such as ploughing a are likely to have obscured any features r Tautauroa Creek is part of a tidal mangrove	Tenant/Manager Address Filekeeper Date Longitude E Liss Present cond danger of de Liss Present cond danger of de	NZAA Fileke	eper b	
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<ul> <li>about 100mm in thickness. No other signs of J Although farm practices such as ploughing a are likely to have obscured any features to Tautauroa Creek is part of a tidal mangrove</li> <li>4. Owner Address Auckland Airport</li> <li>5. Nature of information site survey (visual inspection and probing) Photographs (reference numbers and where they are held) Aerial photographs (reference numbers and clarity of site)</li> <li>6. Reported by Jaden Harris &amp; Noel Hill Address C/O CFG Heritage, P.O Box 10 015, Dominion Rd. Auckland.</li> <li>7. Key words</li> <li>8. New Zealand Register of Archaeological Sites (for affice NZHPT Site Field Code</li> <li>Latitude S Miß Type of site</li> <li>Local environment today [Å]£ Land classification</li> </ul>	Tenant/Manager Address Filekeeper Date Use) Longitude E [Lic] Present condi danger of de Lic] Security code [Lic] Local body	NZAA Fileke	eper 06	
<ul> <li>about 100mm in thickness. No other signs of J Although farm practices such as ploughing a are likely to have obscured any features is Tautauroa Creek is part of a tidal mangrove a tidal mangrove</li> <li>4. Owner Address Auckland Airport</li> <li>5. Nature of information site survey (visual inspection and probing) Photographs (reference numbers and where flay are held) Aerial photographs (reference numbers and clarity of site)</li> <li>6. Reported by Jaden Harris &amp; Noel Hill Address C/O CPG Heritage, P.O Box 10 015, Dominion Rd. Auckland.</li> <li>7. Key words</li> <li>8. New Zealand Register of Archaeological Sites (for office in NZHPT Site Field Code</li> <li>Latitude S</li> <li>Mad Site Land classification</li> <li>d by: rodclough</li> </ul>	Tenant/Manager Address Filekeeper Date Longitude E [LK] Present cond danger of de Local body	NZAA Fileke	eper 1	22/09

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION



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#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: R11/2379
Site description	•
'Updated 09/09/2014 (Field visit), submitted by rodclough , vi Grid reference (E1760047 / N5905156)	isited 17/02/2014 by Farley, Glen
This midden is an extension to site R11/2379, being situated midden was noted to spread irregularly over an area of appromajority of material has been spread into this area by ploughi this material followed a natural dip which drains down into a site, following a range of alignments. It was found that the site 50mm.	inland from the recorded portion of the deposit. The additional ximately 27m (EW) by 10m (NS). It is thought likely that the ng and other farming activities, particularly as the alignment of mall gully. Multiple plough lines are noted to run through the e was generally quite thin, with a maximum thickness of just
A range of other features were noted to extend away from the drains, fire scoops, and postholes forming house structures, M approximately 65m NS by 45m EW. A minimum of three hous been rebuilt at some point along a slightly different alignment, identified, some forming clear fence lines, while others appea	e midden, primarily to the north. These included various pits, Maori in origin. This spreads over an area measuring se structures were identified, of which one appears to have . A series of post holes from more modern structures were also r to have been sheds or other farm type structures.'
Condition of the site	
'Updated 09/09/2014 (Field visit), submitted by rodclough , vi	isited 17/02/2014 by Farley, Glen
The majority of the site was removed during the subdivision w	vorks, apart for those areas within the coastal buffer.
Midden is actively eroding down the bank, due to stock tramp site, with possible intact midden located at top of bank. No oth	ling and natural slumping. Area probed to determine extent of her visible evidence of occupation. (2006)'
Statement of condition	
Updated: 19/09/2014, Visited: 15/02/2014 - Fair - Some intact	t features, but others may be unclear or damaged
Current land use:	
Updated: 19/09/2014 - Grazing, Coastal margins, Industrial/ c	commercial
Threats:	
Updated: 19/09/2014 - Stock trampling, Erosion, Erosion, Tre	e planting (other than forestry)

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### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD I	NVENTORY		NZAA SITE NUMBER: R11/23	379
Observations abou	t this site <mark>made i</mark> r	1		
Author	Year	Title	Publication Details	
Supporting docume	entation held in A	rchSite		Rt /2336
rinted by: rodclough				22/09/201

#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM (NZMS260) NZMS 260 map number NZMS 260 map name NZMS 260 map edition	NZAA METRIC SITE NUMBER R11/336 DATE VISITED 04/08/2006 SITE TYPE Midden SITE NAME: MAORI OTHER	2379 94
Grid Reference Easting .2 .6  7  0 ]	4 5 .2 . Northing .6 .4 6 6 8 4 .7	
<ol> <li>Aids to relocation of site (attach a sketch map) See attached map. Located on the West side of Pukaki Cre Grid reference taken with handheld GPS</li> </ol>	ek, c.90m North of site R11/1360. , accuracy */- 7 metres.	
<ol> <li>State of site and possible future damage Midden actively eroding down bank, due t under pasture and grazed by cows.</li> </ol>	to stock trampling and natural slumping	. Currently
extending about 15m along the bank and a to determine extent of site, with possii visible evidence of occupation at the top are likely to have been obscured by plou although sub-surface evidence may stil	about 1m back from the top of the bank. ble intact midden located at top of ban o f the bank. Any features such as pits ghing, stock damage, and other farming 1 remain. Pukaki Creek is a tidal man	Area probed k. No other pr terraces practices, prove swamp
A Owner	TenantiMenanger	
<ol> <li>Chanel draining into Manukau Harbour.</li> <li>4. Owner Address</li> </ol>	TenantiManager Address	
4. Owner Address Auckland Airport	TenantiManager Address	
4. Owner Address Auckland Airport	TenantiManager Address	
<ul> <li>4. Owner Address Auckland Airport</li> <li>5. Nature of information Site survey (visual inspection and probing) Photographs (reference numbers and where they are heid) Aerial photographs (reference numbers and clar cited)</li> </ul>	Tenant/Manager Address	
<ul> <li>4. Owner Address Auckland Airport</li> <li>5. Nature of Information Site survey (visual inspection and probing) Photographs (reference numbers and where they are heid) Aerial photographs (reference numbers and clar site)</li> <li>6. Reported by Jaden Harris &amp; Noel Hill Address C/O CFG Heritage P.O Box 10 015 Dominion Road, Auckland.</li> </ul>	TenantiManager Address ity of Filekceper By AUSI NZAA Fileke Date 25 OCT 20 Auckland	aper 6
<ol> <li>Chanel draining into Manukau Harbour.</li> <li>Owner Address Auckland Airport</li> <li>Nature of information Site survey (visual inspection and probing) Photographs (reference numbers and where they are held) Aerial photographs (reference numbers and clar site)</li> <li>Reported by Jaden Harris &amp; Noel Hill Address C/O CPG Haritage P.O Box 10 015 Dominion Road, Auckland.</li> <li>Key words</li> </ol>	TenantiManager Address ity of Filekceper Buraus, NZAA Fileke Date 25 OCT 20 Auckland	aper 6
<ol> <li>Cowner Address Auckland Airport</li> <li>Nature of information Site survey (visual inspection and probing) Photographs (reference numbers and where they are heid) Aerial photographs (reference numbers and clar site)</li> <li>Reported by Jaden Harris &amp; Noel Hill Address C/O CPG Heritage P.O Box 10 015 Dominion Road, Auckland.</li> <li>Key words</li> <li>New Zealand Register of Archaeological Sites (for o NZHPT Site Field Code</li> </ol>	Tenant/Manager Address nty of Filekceper Of AUS NZAA Fileke Date 25 OCT 20 Auckland	aper 6
<ol> <li>Cowner Address Auckland Airport</li> <li>Nature of information Site survey (visual inspection and probing) Photographs (reference numbers and where they are heid) Aerial photographs (reference numbers and clar site)</li> <li>Reported by Jaden Harris &amp; Noel Hill Address C/O CPG Heritage P.O Box 10 015 Dominion Road, Auckland.</li> <li>Key words</li> <li>Net Zealand Register of Archaeological Sites (for on NZHPT Site Field Code</li> <li>Latitude S</li> </ol>	Tenant/Manager Address nty of Filekceper Oracs NZAA Fileke Date 25 OCT 20 Auckland iffice use)	aper 6
<ul> <li>4. Owner Address Auckland Airport</li> <li>5. Nature of information Site survey (visual inspection and probing) Photographs (reference numbers and where they are heid) Aerial photographs (reference numbers and clar site)</li> <li>6. Reported by Jaden Harris &amp; Noel Hill Address C/O CPG Heritage P.O Box 10 015 Dominion Road, Auckland.</li> <li>7. Key words</li> <li>8. New Zealand Register of Archaeological Sites (for on NZHPT Site Field Code</li> <li>Latitude S</li> <li>MM Type of site</li> </ul>	Tenant/Manager Address nty of Filekceper Oracs NZAA Fileke Date 25 OCT 20 Auckland iffice use) Longitude E	aper 6
<ul> <li>chanel draining into Manukau Barbour.</li> <li>4. Owner Address Auckland Airport</li> <li>5. Nature of Information Site survey (visual inspection and probing) Photographs (reference numbers and where they are held) Aerial photographs (reference numbers and clar site)</li> <li>6. Reported by Jaden Barris &amp; Noel Hill Address C/O CPG Heritage P.O Box 10 015 Dominion Road, Auckland.</li> <li>7. Key words</li> <li>8. New Zealand Register of Archaeological Sites (for o NZHPT Site Field Code</li> <li>Latitude S</li> <li>[MA] Type of site</li> <li>[MA] Local environment today</li> </ul>	TenantiManager Address nity of Filekeeper DAUS NZAA Fileke Date 25 OCT 20 Auckland affice use) Longitude E BIS Present condition & future danger of destruction LL Security code	aper 6

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### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: R11/2952
Site description	
Updated 08/09/2014 (Field visit), submitted by rodclough , vis Grid reference (E1759883 / N5905108)	ited 10/02/2014 by Farley, Glen
The site consists of two small shell patches. The larger site me Bm (NE-SW) by 1.4m (NW-SE). Both sites were up to 30mm th activities and cattle trampling. This deposit was noted to be over elate to the early European occupation of this property. 19th C of the gully some 40-60m to the west.'	easures 4m (NW-SE) by 3.5m (NE-SW), while the smaller is nick, and noted to be fairly heavily disturbed by farming erwhelmingly composed of oyster shells and therefore may century European artefacts were also uncovered in the base
Condition of the site	
Statement of condition	
Jpdated: 19/09/2014, Visited: 08/02/2014 - Destroyed - Evider part of the current property subdivision works, under NZHPT A	nce must be provided' - This site has been destroyed as uthority No. 2014/573.'
Current land use:	
Jpdated: 19/09/2014, Visited: 08/02/2014 - Industrial/ commer	cial
Threats:	
Jpdated: 19/09/2014, Visited: 08/02/2014 - Subdivision	
isted by sodelaugh	וסטנכנ

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#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: R11/2953
Site description	
Updated 08/09/2014 (Field visit), submitted by rodclough , vis Grid reference (E1759869 / N5904899)	sited 07/02/2014 by Farley, Glen
A portion of this site was modified under the conditions of Aut measures 6.3m (E-W) by 1.4m (N-S). The full north south extr but probing indicated the site continued for at least 7 meters to by farming activities and cattle trampling, being quite patchy, I comprised of cockle shells, although pipi and gastropods were	hority No. 2014/573. The excavated portion of the site ent of the site was not exposed due to the limit of excavations o the south. The site was noted to be fairly heavily disturbed but up to 150mm thick in places. This site was largely e also present.'
Condition of the site	
Updated 08/09/2014 (Field visit), submitted by rodclough , vis	sited 07/02/2014 by Farley, Glen
This site condition is just fair, as it appears to have been dama activities. Some material appears to be eroding down the coas	aged in the past by cattle trampling and other farming stal bank.'
Statement of condition	
Updated: 19/09/2014, Visited: 05/02/2014 - Fair - Some intact	features, but others may be unclear or damaged
Current land use:	
Updated: 19/09/2014, Visited: 05/02/2014 - Coastal margins,	Industrial/ commercial
Threats:	
Updated: 19/09/2014 Visited: 05/02/2014 Tree planting (oth	er than forestru)
inted by: rodclough	22/09/2

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#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: R11/2954
Site description	
'Updated 08/09/2014 (Field visit), submitted by rodclough , Grid reference (E1760033 / N5904923)	visited 12/02/2014 by Farley, Glen
This site was modified under the conditions of Authority No. 1cm thick, being very heavily damaged by prior farming activ	2014/573. The site measures approximately 8m x 3m and up to vities."
Condition of the site	
Statement of condition	
Updated: 19/09/2014, Visited: 10/02/2014 - Destroyed - Evic part of the subdivision works.	dence must be provided- The entire site was destroyed as
Current land use:	
Updated: 19/09/2014, Visited: 10/02/2014 - Industrial/ comm	nercial
Threats:	
Printed by: rodclough	22/09/2014

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22/09/2014

1 of 3

#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: R11/2955
Site description	
Updated 08/09/2014 (Field visit), submitted by rodclough , vi Grid reference (E1759838 / N5904943)	isited 21/02/2014 by Farley, Glen
This site was modified under the conditions of Authority No. 2 The site was noted to be moderately disturbed by farming act hrough the site. The midden deposit is generally very thin, ra were noted, including cockle, pipi, mud snail, paua, scallop, fi artefacts were recovered from this site. A series of small post recorded when the midden layer was stripped back.'	2014/573. The site measures 14.5m (NW-SE) by 6m (NE-SW divities and cattle trampling, with plough lines noted to run inging from 30 to 60mm thick. A wide range of shellfish specie ine dosinia and a range of gastropod species. Ten obsidian tor stake holes, along with a remnant fire scoop, were also
Condition of the site	
Statement of condition	
Updated: 19/09/2014, Visited: 19/02/2014 - Destroyed - Evide removed during the subdivision works.	ence must be provided- This site was recorded and entirely
Current land use:	
Jpdated: 19/09/2014, Visited: 19/02/2014 - Industrial/ comme	ercial
Threats:	

Printed by: rodclough

22/09/2014

2 of 3



1 of 3

#### NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: R11/2956
Site description	
'Updated 08/09/2014 (Field visit), submitted by rodcloug Grid reference (E1759896 / N5905081)	gh , visited 11/02/2014 by Farley, Glen
The timber structure measures 1.5m by 1.5m, and was a century or early 20th-century origin. It is unclear what the lined feature, not unlike a well, the situation means that and a hitch, possibly of 19th-century origin were recover collected from further up the gully, indicating use of this	a minimum of 1.2m deep. This feature is probably of either late 19th- e purpose of this structure was. Although it is a rectangular timber saltwater would fill this area on the tide. Pieces of iron strapping red from the fill. A number of 19th-century artefacts were also area, at this time.'
Condition of the site	
Statement of condition	
Updated: 19/09/2014, Visited: 09/02/2014 - Destroyed - during subdivision works.	Evidence must be provided- The structure was entirely removed
Current land use:	
Updated: 19/09/2014, Visited: 09/02/2014 - Industrial/ co	ommercial
Threats:	
Printed by: rodclough	22/09/201-

### **APPENDIX B: XRF CALIBRATION PROCEDURE**

**Methodology** The Bruker Tracer III SD portable X-ray Fluorescence (pXRF) analyser employs an X-ray tube with an Rh target and a 10mm2 silicon drift detector (SDD), with a typical resolution of 145eV at 100,000cps. The X-ray tube is operated with a setting of 40 keV at 12µA, through a window composed of 12mil Al and 1mil Ti filters (Bruker's Yellow filter).

Two different calibrations are used for lithics based on differences in major element compositions. The "Low" calibration is used for stone with relatively low silica concentrations (i.e., less than ca. 65%), such as basalts, greywackes and dacites. The "High" calibration is intended for materials with higher silica concentrations (i.e., those above 65%), such as obsidians and cherts. The two calibrations produce almost identical values for the heavier trace elements (i.e., Ni — Nb) but it has been found that separating materials by silica content results in lower errors for the major elements (K2O, CaO, TiO2, MnO and Fe2O3).

Low A set of 40 reference samples is used for the Low calibration. They include 23 international standards (BCR-2, BHVO-1, BIR-1, DNC-1, GA, G2, GSP2, JA-2, JB-1a, JB-2, JB-3, JF-1, JG-1a, JG-2, JGb-1, MRG-1, NIM-D, NIM-P, NIST-688, OU-1, OU-2, SY2, SY3) and 17 "in-house" standards of Oceanic and New Zealand fine-grained volcanic stone from the Anthropology Laboratory reference collection analysed at the University of Auckland, School of the Environment Geology Laboratory using Wavelength Dispersive X-ray Fluorescence (MQ-1521, AIT-4C, MOT-2, MOT-3D, Raglan 2, Rap 1D, R 10-C, R16-B, AU-3052, MQ-1524a, MQ-5138, MQ-5248, MQ-5317a, MQ-5337, MQ-5567, MQ-5625a, AIT-4B). Eighteen elements are quantified by this calibration (K2O, CaO, TiO2, V, Cr, MnO, Fe2O3, Ni, Cu, Zn, Ga Pb, Th, Rb, Sr, Y, Zr, Nb).

High Calibration A total of 32 reference specimens are used for this calibration, including 26 international standards (AGV2a, ANU 2000, DTS-1, G2, GA, GSP2, JA-2, JF-1, JG-1a, JG-2, JP-1, JR-1, MAG-1, NIM\_S, NIM-G, NIST-278, OU-1, Pacs-2, QLO1b, RGM-1, SCO-1, SDC-1, SGR-1, STM-1, SY2, YG-1 A and six New Zealand obsidian specimens from the Anthropology Laboratory reference collection that were analysed using Wavelength Dispersive X-ray Fluorescence (AU-17.59, AU-29.16, AU-32.1, AU-7.21, AU-9.3, AU-9.5). Fourteen elements are quantified by the high calibration (K2O, CaO, TiO2, MnO, Fe2O3, Zn, Ga Pb, Th, Rb, Sr, Y, Zr, Nb).

High<br/>Calibration,<br/>continuedConcentrations are calculated as oxide percentages (%) for major elements and<br/>as parts-per-million (ppm) for trace elements using Bruker's S1CalProcess<br/>(ver. 2.2.33) software. Standards are analysed three times each for 120 seconds<br/>and the results averaged. Selected standards are run each time the instrument is<br/>operated to check for instrument drift and the full sets of standards are run at<br/>six-month intervals. Results for the most recent calibrations (October 2014) are<br/>shown below (Figures A1 and A2).



Continued on next page

Figure A1, *continued* 



Continued on next page



Calibrated PXRF value (ppm)

Continued on next page

150

Calibrated PXRF value (ppm)



Figure A2, *continued* 



### **APPENDIX C: RADIOCARBON RESULTS**



Radiocarbon Dating Laboratory

Private Bag 3105 Hamilton, New Zealand. Ph +64 7 838 4278 email c14@waikato.ac.nz Tuesday, 13 January 2015

Report on Radiocarbon Age Determination for Wk- 40791




Radiocarbon Dating Laboratory

Private Bag 3105 Hamilton, New Zealand. Ph +64 7 838 4278 email c14@waikato.ac.nz Tuesday, 13 January 2015

Report on Radiocarbon Age Determination for Wk- 40792 Submitter S Bickler Submitter's Code R11/2379 F131 Site & Location R11/2379, New Zealand Sample Material Cockle **Physical Pretreatment** Surfaces cleaned. Washed in an ultrasonic bath. Tested for recrystallization: aragonite. Chemical Pretreatment Sample acid washed using 2 M dil. HCl for 120 seconds, rinsed and dried. Comments δ<sup>13</sup>C 0.7 ± 0.2 % D<sup>14</sup>C -86.4 ± 2.6 % F14C% 91.4 ± 0.3 % Result 726 ± 23 BP :5: Marine13 r rine curve (Re ar et al 2013) Delta Rf-7.45 Wk40792 R\_Date(726,23) 68.2% probability 1524 (68.2%) 1636calAD Radiocarbon determination (BP) 1000 95.4% probability 1480 (95.4%) 1670calAD 800 600 400 1600 1400 1800 2000 Calibrated date (calAD) 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 CO2. F14C% is also known as Percent Modern Carbon (pMC).



Private Bag 3105 Hamilton, New Zealand. Ph +64 7 838 4278 email c14@waikato.ac.nz Tuesday, 13 January 2015

Radiocarbon Dating Laboratory





Radiocarbon Dating Laboratory

Private Bag 3105 Hamilton, New Zealand. Ph +64 7 838 4278 email c14@waikato.ac.nz Tuesday, 13 January 2015

Report on Radiocarbon Age Determination for Wk- 40794 Submitter S Bickler Submitter's Code R11/2955 S1 Site & Location R11/2955, New Zealand Sample Material Cockle Physical Pretreatment Surfaces cleaned. Washed in an ultrasonic bath. Tested for recrystallization: aragonite. Chemical Pretreatment Sample acid washed using 2 M dil. HCl for 120 seconds, rinsed and dried. Comments δ<sup>13</sup>C 0.7 ± 0.2 % -78.7 ± 3.5 ‰ D<sup>14</sup>C F14C% 92.1 ± 0.3 % Result 658 ± 30 BP Wk40794 R\_Date(658,30) 1000 68.2% probability 1567 (68.2%) 1687calAD Rediocarbon determination (BP) 95.4% probability 1503 (94.2%) 1760calAD 800 1787 (1.2%) 1803calAD 600 400 1 1600 1700 1500 1800 1900 2000 1400 Calibrated date (calAD) 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,  $_{\delta}l^{3}C$  , is expressed as ‰ wrt PDB and is measured on sample CO2. F14C% is also known as Percent Modern Carbon (pMC).



Private Bag 3105 Hamilton, New Zealand. Ph +64 7 838 4278 email c14@waikato.ac.nz Wednesday, 18 February 201.





Radiocarbon Dating Laboratory

Report on Radiocarbon Age Determination for Wk- 40916

Private Bag 3105 Hamilton, New Zealand. Ph +64 7 838 4278 email c14@waikato.ac.nz Wednesday, 18 February 201.





Radiocarbon Dating Laboratory

Report on Radiocarbon Age Determination for Wk- 40917

Private Bag 3105 Hamilton, New Zealand Ph +64 7 838 4278 email c14@waikato ac nz Wednesday, 18 February 201.



# **APPENDIX D: CONTEXT RECORDS**

### R11/2378. All measurements presented in millimetres

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
1	Midden	Moderate	Mid greyish brown	Shell and clayey loam silt	Moderate rock and charcoal	9000	6000	100
2	Natural Subsoil	Firm	Light brownish yellow	Clayey subsoil	N/A	N/A	N/A	N/A

### R11/2379

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
1	Midden	Moderate to firm	Mid brownish white	Silt and shell	Moderate burnt rock, moderate charcoal and very occasional struck stone	20000	10000	50
2	Pit	Very firm	Light orangey yellow	Redeposited subsoil	Moderate silt	1160	660	100
3	Pit	Very firm	Mid brownish yellow	Redeposited subsoil	Moderate silt, very occasional charcoal and burnt rock	2600	1200	140
4	Pit	Very firm	Mid grey	Silt	Occasional subsoil, very occasional charcoal	4050	1800	60
5	Drain of pit (4)	Firm	Light yellowish grey	Redeposited subsoil and silt	N/A	6100	130	85
6	Pit	Firm	Light grey	Silt and redeposited subsoil	Very occasional charcoal	4700	1800	110
7	Drain of pit (6)	Firm	Mid grey	Silt	Very occasional charcoal	4800	200	80
8	Posthole	Firm	Dark grey	Silt and redeposited subsoil	N/A	165	165	N/A

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
9	Pit	Firm	Mid grey	Silt and redeposited subsoil	Very occasional charcoal and burnt rock	2450	1680	370
10	Pit	Firm	Dark grey	Silt and redeposited subsoil	Moderate burnt rock and charcoal	4850	2070	140
11	Drain of pit (10)	Firm	Mid grey	Silt	N/A	3990	160	90
12	Pit	Firm	Dark blackish grey	Silt and redeposited subsoil	Occasional charcoal and burnt rock	3450	1900	280
13	Drain of pit (12)	Firm	Mid grey	Silt	Very occasional rock	3120	290	N/A
14	Pit	Firm	Light to mid grey	Silt and redeposited subsoil	Occasional burnt rock	5530	2070	160
15	Drain of pit (14)	Firm	Mid grey	Silt	N/A	5750	210	230
16	Pit	Firm	Mid grey	Silt and redeposited subsoil	Occasional burnt rock	3500	1740	190
17	Drain of pit (16) and connects (15)	Firm	Light grey	Redeposited subsoil with some silt	N/A	2230	120	120
18	Drain of pit (16) and connects (15)	Firm	Light grey	Silt and redeposited subsoil	N/A	4120	110	80
19	Pit	Firm	Mid grey	Silt	Very occasional charcoal	2920	1690	30
20	Midden	Moderate to firm	Mid whitish brown	Silt and shell	Occasional charcoal	3900	2000	10
21	European Post	Firm	Mid yellowish brown	Silt and redeposited subsoil	Moderate wood	280	280	N/A
22	European Post	Firm	Mid yellowish brown	Silt and redeposited subsoil	Moderate wood	280	280	N/A
23	European Post	Firm	Mid yellowish brown	Silt and redeposited subsoil	Moderate wood	280	280	N/A
24	European Post	Firm	Mid yellowish brown	Silt and redeposited subsoil	Moderate wood	280	280	N/A

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
25	European Post	Firm	Mid yellowish brown	Silt and redeposited subsoil	Moderate wood	280	280	N/A
26	European Post	Firm	Mid yellowish brown	Silt and redeposited subsoil	Moderate wood	280	280	N/A
27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
28	Natural Subsoil	Firm	Light brownish yellow	Clayey subsoil	N/A	N/A	N/A	N/A
29	Pit	Firm	Light grey	Silt and redeposited subsoil	N/A	1450	560	210
30	Fire scoop	Firm	Dark reddish black	Silt, shell, rock and charcoal	N/A	1000	1000	100
31	Drain of pit (9)	Firm	Mid grey	Silt and subsoil	N/A	4550	260	75
32	Fire scoop	Firm	Mid greyish brown	Silt	Moderate charcoal, shell and burnt stone	1200	900	70
33	Posthole	Moderate	Mid greyish brown	Silt	Moderate burnt rock, charcoal and shell	120	120	120
34	Posthole	Moderate	Mid greyish brown	Silt	Moderate burnt rock, charcoal and shell	160	160	270
35	Posthole	Firm	Light yellowish brown	Silt with redeposited subsoil	Occasional shell, charcoal and burnt rock	120	90	180
36	Fire scoop	Firm	Mid grey	Silt	Moderate charcoal and burnt rock	1250	1220	90
37	Posthole	Firm	Mid grey	Silt	N/A	150	140	200
38	Posthole	Firm	Mid grey	Silt	N/A	150	100	150
39	Posthole	Firm	Mid grey	Silt	N/A	80	80	65
40	Posthole	Firm	Mid grey	Silt	N/A	120	100	170

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
41	Posthole	Firm	Mid grey	Silt	N/A	130	120	50
42	Posthole	Firm	Mid grey	Silt	N/A	130	125	200
43	Posthole	Firm	Mid grey	Silt	N/A	150	140	45
44	Posthole	Firm	Mid grey	Silt	N/A	132	127	162
45	Posthole	Firm	Mid grey	Silt	N/A	150	125	180
46	Posthole	Firm	Mid grey	Silt	N/A	153	135	143
47	Posthole	Firm	Mid grey	Silt	N/A	143	126	197
48	Posthole	Firm	Mid grey	Silt	N/A	117	96	141
49	Posthole	Firm	Mid grey	Silt	N/A	142	130	64
50	Posthole	Firm	Mid grey	Silt	N/A	142	133	100
51	Posthole	Firm	Mid grey	Silt	N/A	322	201	228
52	Posthole	Firm	Mid grey	Silt	N/A	184	158	126
53	Posthole	Firm	Mid grey	Silt	N/A	110	98	42
54	Posthole	Firm	Mid grey	Silt	N/A	129	111	70
55	Posthole	Firm	Mid grey	Silt	N/A	181	148	196
56	Posthole	Firm	Mid grey	Silt	N/A	120	110	169
57	Posthole	Firm	Mid grey	Silt	N/A	121	114	132
58	Posthole	Firm	Mid grey	Silt	N/A	190	180	125
59	Posthole	Firm	Mid grey	Silt	N/A	135	120	110
60	Posthole	Firm	Mid grey	Silt	N/A	150	130	63
61	Posthole	Firm	Mid grey	Silt	N/A	136	124	122
62	Posthole	Firm	Mid grey	Silt	N/A	150	130	63
63	Posthole	Firm	Mid grey	Silt	N/A	157	130	131
64	Posthole	Firm	Mid grey	Silt	N/A	123	106	148

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
65	Posthole	Firm	Mid grey	Silt	N/A	129	119	94
66	Posthole	Firm	Mid grey	Silt	N/A	149	123	184
67	Posthole	Firm	Mid grey	Silt	N/A	126	125	88
68	Posthole	Firm	Mid grey	Silt	N/A	94	80	98
69	Posthole	Firm	Mid grey	Silt	N/A	210	190	55
70	Posthole	Firm	Mid grey	Silt	N/A	286	208	96
71	Posthole	Firm	Mid grey	Silt	N/A	144	143	112
72	Posthole	Firm	Mid grey	Silt	N/A	234	177	192
73	Posthole	Firm	Mid grey	Silt	N/A	298	220	111
74	Posthole	Firm	Mid grey	Silt	N/A	118	100	71
75	Posthole	Firm	Mid grey	Silt	N/A	134	110	48
76	Posthole	Firm	Mid grey	Silt	Occasional charcoal	100	100	72
77	Bin pit	Very firm	Light yellowish grey to light brownish yellow	Subsoil and silt mix grading into relatively clean subsoil	Very occasional charcoal and struck stone	720	490	390
78	Bin pit	Very firm	Mid brownish grey to light brownish yellow	Silt grading into a mix of silt and re-deposited subsoil	Very occasional charcoal, and burnt rock and struck stone	1400	840	650
79	N/A	N/A	N/A	N/A	N/A	180	110	30
80	Posthole	Firm	Mid grey	Silt	Occasional charcoal	130	97	32
81	Posthole	Firm	Mid grey	Silt	Occasional charcoal	180	156	61
82	Posthole	Firm	Mid grey	Silt	Occasional charcoal	142	121	46
83	Posthole	Firm	Mid grey	Silt	Occasional charcoal	160	100	52
84	Posthole	Firm	Mid grey	Silt	Occasional charcoal and burnt rock	200	172	70
85	N/A	N/A	N/A	N/A	N/A	440	180	60
86	Posthole	Firm	Mid grey	Silt	N/A	355	303	148

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
87	Posthole	Firm	Mid grey	Silt	Occasional charcoal	142	138	48
88	Posthole	Firm	Mid grey	Silt	N/A	112	105	102
89	Posthole	Firm	Mid grey	Silt	N/A	210	123	123
90	Posthole	Firm	Mid grey	Silt	N/A	190	178	57
91	Posthole	Firm	Mid grey	Silt	N/A	121	105	100
92	Fire scoop	Moderate	Dark brownish grey	Silt	Frequent charcoal and burnt rock	900	900	100
93	Posthole	Firm	Mid grey	Silt	N/A	122	98	108
94	Posthole	Firm	Mid grey	Silt	N/A	127	72	41
95	Posthole	Firm	Mid grey	Silt	N/A	138	120	156
96	Posthole	Firm	Mid grey	Silt	N/A	298	140	80
97	Posthole	Firm	Mid grey	Silt	N/A	118	96	47
98	Posthole	Firm	Mid grey	Silt	N/A	122	74	27
99	Posthole	Firm	Mid grey	Silt	N/A	134	125	140
100	Posthole	Firm	Mid grey	Silt	N/A	154	143	130
101	N/A	N/A	N/A	N/A	N/A	820	320	120
102	Posthole	Firm	Mid grey	Silt	N/A	148	142	90
103	Posthole	Firm	Mid grey	Silt	N/A	107	93	50
104	Posthole	Firm	Mid grey	Silt	Occasional charcoal	244	146	53
105	Posthole	Firm	Mid grey	Silt	N/A	280	240	20
106	Posthole	Firm	Mid grey	Silt	Occasional charcoal	228	175	123
107	Posthole	Firm	Mid grey	Silt	N/A	143	118	100
108	Posthole	Firm	Mid grey	Silt	N/A	150	140	72
109	Posthole	Firm	Mid grey	Silt	N/A	146	115	53
110	Posthole	Firm	Mid grey	Silt	N/A	320	290	40

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Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
111	Posthole	Firm	Mid grey	Silt	N/A	330	330	56
112	Posthole	Firm	Mid grey	Silt	N/A	350	340	79
113	Posthole	Firm	Mid grey	Silt	N/A	470	350	76
114	Posthole	Firm	Mid grey	Silt	Occasional charcoal	460	430	78
115	Posthole	Firm	Mid grey	Silt	N/A	193	180	72
116	Posthole	Firm	Mid grey	Silt	Occasional charcoal	240	220	125
117	Fire scoop	Firm	Mid grey	Silt	Moderate charcoal and burnt rock	550	380	150
118	Posthole	Firm	Mid grey	Silt	Occasional charcoal	240	215	30
119	Posthole	Firm	Mid grey	Silt	Occasional charcoal	330	300	N/A
120	Posthole	Firm	Mid grey	Silt	Occasional charcoal	310	300	N/A
121	Posthole	Firm	Mid grey	Silt	N/A	200	200	N/A
122	Posthole	Firm	Mid grey	Silt	N/A	200	180	N/A
123	Posthole	Firm	Mid grey	Silt	N/A	310	310	10
124	Posthole	Firm	Mid grey	Silt	N/A	280	265	15
125	Posthole	Firm	Mid grey	Silt	N/A	280	280	25
126	Fire scoop	Firm	Mid grey	Silt	Occasional charcoal	660	600	50
127	Drain	Firm	Mid grey	Silt	N/A	4430	80	3
128	Posthole	Firm	Mid grey	Silt	N/A	330	310	15
129	Fire scoop	Firm	Mid grey	Silt	Frequent burnt rock and moderate charcoal	1500	890	45
130	Posthole	Firm	Mid grey	Silt	N/A	80	50	N/A
131	Midden	Moderate	Mid grey	Silt and shell	Moderate burnt rock and charcoal	5000	4150	30
132	Posthole	Firm	Mid grey	Silt	N/A	260	230	270

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
133	Fire scoop	Firm	Mid grey	Silt and shell	Moderate burnt rock and charcoal	700	630	148
134	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
135	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
136	Posthole	Firm	Mid grey	Silt	N/A	145	140	60
137	Posthole	Firm	Mid grey	Silt	N/A	220	200	215
138	Posthole	Firm	Mid grey	Silt	N/A	130	115	157
139	Fire scoop	Firm	Mid grey	Silt	Moderate burnt rock and charcoal	930	930	48
140	Posthole	Firm	Mid grey	Silt	N/A	179	115	67
141	Posthole	Firm	Mid grey	Silt	Occasional charcoal	90	90	58
142	Pit	Firm	Mid grey	Silt	Occasional charcoal	2730	1050	98
143	Posthole	Firm	Mid grey	Silt	Occasional burnt rock	100	90	N/A
144	Posthole	Firm	Mid grey	Silt	N/A	149	140	93
145	Posthole	Firm	Mid grey	Silt	Occasional burnt rock and charcoal	180	178	82
146	Posthole	Firm	Mid grey	Silt	N/A	98	89	65
147	Posthole	Firm	Mid grey	Silt	N/A	135	112	111
148	Posthole	Firm	Mid grey	Silt	Occasional burnt rock and charcoal	98	89	68
149	Posthole	Firm	Mid grey	Silt	N/A	80	70	34
150	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	135	125	70
151	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	180	120	60
152	Posthole and slot	Firm	Mid grey	Silt	Occasional burnt rock and charcoal	165	160	270
153	Posthole	Firm	Mid grey	Silt	N/A	130	130	N/A

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
154	Posthole	Firm	Mid grey	Silt	Moderate charcoal	140	120	140
155	Posthole and slot	Firm	Mid grey	Silt	Very occasional charcoal	420	110	105
156	Posthole	Firm	Mid grey	Silt	Occasional charcoal	130	130	140
157	Posthole and slot	Firm	Mid grey	Silt	Very occasional charcoal	580	80	115
158	Posthole	Firm	Mid grey	Silt	Moderate charcoal and occasional burnt rock	170	170	95
159	Posthole	Firm	Mid grey	Silt	N/A	150	150	N/A
160	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	165	150	390
161	Posthole	Firm	Mid grey	Silt	Moderate charcoal and very occasional burnt rock	170	145	85
162	Slot	Firm	Mid grey	Silt	Very occasional charcoal	1130	100	N/A
163	Slot	Firm	Mid grey	Silt	Very occasional charcoal	2040	110	140
164	Slot	Firm	Mid grey	Silt	Very occasional charcoal	1700	110	25
165	Posthole and slot	Firm	Mid grey	Silt	Very occasional charcoal	180	90	N/A
166	Posthole	Firm	Mid grey	Silt	N/A	90	90	35
167	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	90	85	65
168	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
169	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	170	170	N/A
170	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	70	70	N/A
171	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	140	120	N/A
172	Slot	Firm	Mid grey	Silt	Very occasional charcoal	350	80	N/A
173	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	80	80	N/A
174	Fire scoop	Firm	Mid grey	Silt	Very occasional charcoal	1020	680	58
175	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	230	110	110

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
176	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	115	95	100
177	Posthole	Firm	Mid grey	Silt	N/A	200	200	N/A
178	Posthole	Firm	Mid grey	Silt	N/A	100	100	50
179	Drain	Firm	Mid grey	Silt	N/A	1500	50	N/A
180	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
181	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
182	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
183	Posthole	Firm	Mid grey	Silt	N/A	140	130	50
184	Posthole	Firm	Mid grey	Silt	N/A	110	75	55
185	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
186	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
187	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
188	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	140	140	N/A
189	Posthole	Firm	Mid grey	Silt	Very occasional charcoal and burnt rock	130	123	90
190	Posthole	Very firm	Mid grey	Silt	Very occasional charcoal	190	130	110
191	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	290	170	110
192	Posthole	Firm	Mid grey	Silt	N/A	270	195	70
193	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	190	140	70
194	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	160	160	111
195	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	130	105	90
196	Posthole	Firm	Mid grey	Silt	Very occasional burnt rock	210	130	50
197	Posthole	Firm	Mid grey	Silt	N/A	210	180	55

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
198	Posthole	Firm	Mid grey	Silt	N/A	290	250	40
199	Posthole	Firm	Mid grey	Silt	N/A	300	300	N/A
200	Posthole	Firm	Mid grey	Silt	N/A	300	300	N/A
201	Posthole	Firm	Mid grey	Silt	N/A	130	130	N/A
202	Posthole	Firm	Mid grey	Silt	N/A	135	120	55
203	Posthole	Firm	Mid grey	Silt	N/A	220	150	50
204	Posthole	Firm	Mid grey	Silt	Occasional charcoal	120	120	100
205	Posthole	Firm	Mid grey	Silt	N/A	300	190	75
206	Posthole	Firm	Mid grey	Silt	N/A	280	250	40
207	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
208	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
209	Posthole	Firm	Mid grey	Silt	Very occasional struck stone	160	115	100
210	Posthole	Firm	Mid grey	Silt	N/A	130	115	120
211	Posthole	Firm	Mid grey	Silt	Very occasional charcoal	145	145	125
212	Posthole	Firm	Mid grey	Silt	N/A	98	85	15
213	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
214	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
215	Posthole	Firm	Mid grey	Silt	Occasional charcoal	140	130	80
216	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
217	Pit	Firm	Mid grey	Silt	Moderate charcoal, occasional burnt rock	630	500	210
218	Posthole	Firm	Mid grey	Silt	N/A	160	160	65
219	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
220	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
221	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
222	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
223	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
224	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
225	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
226	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
227	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
228	Posthole	Firm	Mid grey	Silt	N/A	100	100	40
229	Posthole	Firm	Mid grey	Silt	Occasional charcoal	125	120	80
230	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
231	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
232	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
233	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
234	Posthole	Very firm	Mid grey	Silt	Moderate charcoal	135	130	80
235	Posthole	Firm	Mid grey	Silt	Occasional charcoal	145	140	95
236	Posthole	Firm	Mid grey	Silt	Occasional charcoal	120	105	48
237	Posthole	Firm	Mid grey	Silt	Occasional charcoal	180	175	138
1000	Interal drain of pit (4)	Firm	Light grey	Silt	N/A	3990 x 1710	120	N/A
1001	Internal posthole of pit (4)	Firm	Light grey	Silt	N/A	200	200	N/A
1002	Internal posthole of pit (4)	Firm	Light grey	Silt	N/A	160	160	N/A
1003	Internal drain of pit (6)	Firm	Light grey	Silt	N/A	1470	60	N/A
1004	Internal drain of pit (6)	Firm	Light grey	Silt	N/A	1900	100	N/A

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
1005	Internal drain of pit (6)	Firm	Light grey	Silt	N/A	350	90	N/A
1006	Internal drain of pit (6)	Firm	Light grey	Silt	N/A	2530	75	N/A
1007	Internal posthole of pit (6)	Firm	Light grey	Silt	N/A	130	130	N/A
1008	Internal posthole of pit (6)	Firm	Light grey	Silt	N/A	130	130	N/A
1009	Internal drain of pit (9)	Firm	Light grey	Silt	N/A	1780	110	N/A
1010	Internal drain of pit (9)	Firm	Light grey	Silt	N/A	1780	80	N/A
1011	Internal drain of pit (12)	Firm	Light grey	Silt	N/A	2250	90	N/A
1012	Internal drain of pit (12)	Firm	Light grey	Silt	N/A	2000	120	N/A
1013	Internal drain of pit (12)	Firm	Light grey	Silt	N/A	2250	100	N/A
1014	Internal posthole of pit (14)	Firm	Light grey	Silt	N/A	170	170	N/A
1015	Internal posthole of pit (14)	Firm	Light grey	Silt	N/A	90	90	N/A
1016	Internal posthole of pit (14)	Firm	Light grey	Silt	N/A	170	170	N/A
1017	Internal drain of pit (14)	Firm	Light grey	Silt	N/A	1810	80	N/A
1018	Internal drain of pit (14)	Firm	Light grey	Silt	N/A	350	60	N/A
1019	Internal drain of pit (14)	Firm	Light grey	Silt	N/A	550	60	N/A
1020	Internal drain of pit (14)	Firm	Light grey	Silt	N/A	2560	90	N/A
1021	Internal drain of pit (14)	Firm	Light grey	Silt	N/A	870	130	N/A
1022	Internal drain of pit (14)	Firm	Light grey	Silt	N/A	370	60	N/A
1023	Internal drain of pit (14)	Firm	Light grey	Silt	N/A	90	60	N/A
1024	Internal drain of pit (16)	Firm	Light grey	Silt	N/A	1740	100	N/A
1025	Internal drain of pit (16)	Firm	Light grey	Silt	N/A	1470	80	N/A
1026	Internal drain of pit (16)	Firm	Light grey	Silt	N/A	1730	100	N/A
1027	Internal posthole of pit (16)	Firm	Light grey	Silt	N/A	130	130	N/A

#### R11/2952

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
1	Midden	Moderate	Mid greyish brown	Oyster shell and clayey loam silt	N/A	4000	3500	30
2	Natural Subsoil	Firm	Light brownish yellow	Clayey subsoil	N/A	N/A	N/A	N/A

#### R11/2953

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
1	Midden	Moderate	Dark greyish brown	Shell and silt	Moderate charcoal and burnt rock	6250	1000	150
2	Natural Subsoil	Firm	Light brownish yellow	Clayey subsoil	N/A	N/A	N/A	N/A

### R11/2954

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
1	Midden	Moderate	Mid greyish brown	Shell and silt	N/A	8000	3000	10
2	Natural Subsoil	Firm	Light brownish yellow	Clayey subsoil	N/A	N/A	N/A	N/A

### R11/2955

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
1	Midden	Moderate to firm	Mid grey	Shell and silt	Moderate burnt rock and occasional charcoal and struck stone	14700	10000	60
2	Natural - Subsoil	Firm	Light brownish yellow	Clayey subsoil	N/A	N/A	N/A	N/A
3	Stakehole	Moderate to firm	Light greyish brown	Silt	Moderate shell	80	60	90
4	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell	50	50	80
5	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell	50	50	80
6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell	125	120	56
8	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell and occasional charcoal	64	62	58
9	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell and occasional charcoal	84	69	95
10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell and occasional charcoal	160	144	80
12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17	Posthole	Moderate	Light greyish brown	Silt	Moderate shell and charcoal	180	160	125
18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell and occasional charcoal	100	95	50
20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22	Posthole	Moderate	Light greyish brown	Silt	Moderate shell and charcoal, occasional burnt rock	140	125	125
23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
26	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell and occasional charcoal	100	95	60
27	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell and occasional charcoal	120	100	85
28	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell and occasional charcoal	130	120	115
29	Posthole	Loose	Light greyish brown	Silt	Moderate shell and occasional charcoal, very occasional burnt rock	125	120	130
30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
38	Fire scoop	Loose	Light greyish brown	Silt	Moderate shell and charcoal	470	350	40
39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Number	Туре	Compaction	Colour	Composition	Inclusions	Length	Width	Depth
40	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell and very occasional charcoal	95	92	34
41	Stakehole	Moderate	Light greyish brown	Silt	Moderate shell and very occasional charcoal and burnt rock	95	90	100
42	Posthole	Moderate	Light greyish brown	Silt	Moderate shell and charcoal, very occasional burnt rock	150	140	110
43	Stakehole	Loose	Light greyish brown	Silt	Moderate shell, occasional charcoal and burnt rock	130	130	115
44	Stakehole	Loose	Light greyish brown	Silt	Moderate shell and charcoal	75	75	25
45	Stakehole	Loose	Light greyish brown	Silt	Moderate shell and occasional charcoal	85	75	65
46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

# APPENDIX E: R11/2379 A3 PLANS









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