

CAMBRIDGE, GROWTH CELL C4 STRUCTURE PLAN: PRELIMINARY ARCHAEOLOGICAL ASSESSMENT

Prepared for Mitchell Daysh

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By

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INTRODUCTION

Project Background

This report has been prepared to inform the C4 Growth Cell Structure Plan which is part of a broader plan to manage future growth in Cambridge. The location of Growth Cell C4 and existing properties within it are shown in Figure 1 with addresses and legal descriptions provided in Table 1. The location of the growth cell within the broader planning and development framework is shown in Figure 2. The structure plan will determine the urban form, use and manner in which infrastructure can be efficiently and cost effectively developed to facilitate residential development in Growth Cell C4. It will also include matters such as connectivity to existing roading networks/urban areas (including cycle and pedestrian linkages) and reserve provisions. Growth Cell C4 is located to the south of the Waikato River and west of Leamington.

An archaeological assessment was commissioned by Mitchell Daysh on behalf of Waipa District Council to identify any archaeological constraints within Growth Cell C4 as part of the Structure Plan process under the Resource Management Act 1991 (RMA) and to identify any potential requirements under the Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA). Recommendations are made in accordance with statutory requirements.

Methodology

The New Zealand Archaeological Association's (NZAA) site record database (ArchSite), Waipa District Plan schedules and the Heritage New Zealand Pouhere Taonga (Heritage NZ) New Zealand Heritage List/Rārangī Kōrero were searched for information on archaeological and other historic heritage sites recorded in the vicinity. Literature and archaeological reports relevant to the area were consulted (see Bibliography). Early survey plans and aerial photographs were checked and archival research was carried out to establish the history of the property.

A survey of the accessible parts of the growth cell was conducted on 25 July 2019. All of Growth Cell C4 to the south of Silverwood Lane was accessible, as were the large open paddocks to the north of the lane. The ground surface was examined for evidence of former occupation (in the form of shell midden, depressions, terracing or other unusual formations within the landscape, or indications of 19th century European settlement remains). Exposed and disturbed soils were examined where encountered for evidence of earlier modification, and an understanding of the local stratigraphy. Subsurface testing with a probe was carried out to determine whether buried archaeological deposits could be identified or establish the nature of possible archaeological features. The locations of the recorded archaeological sites were visited and photographed and site records updated.

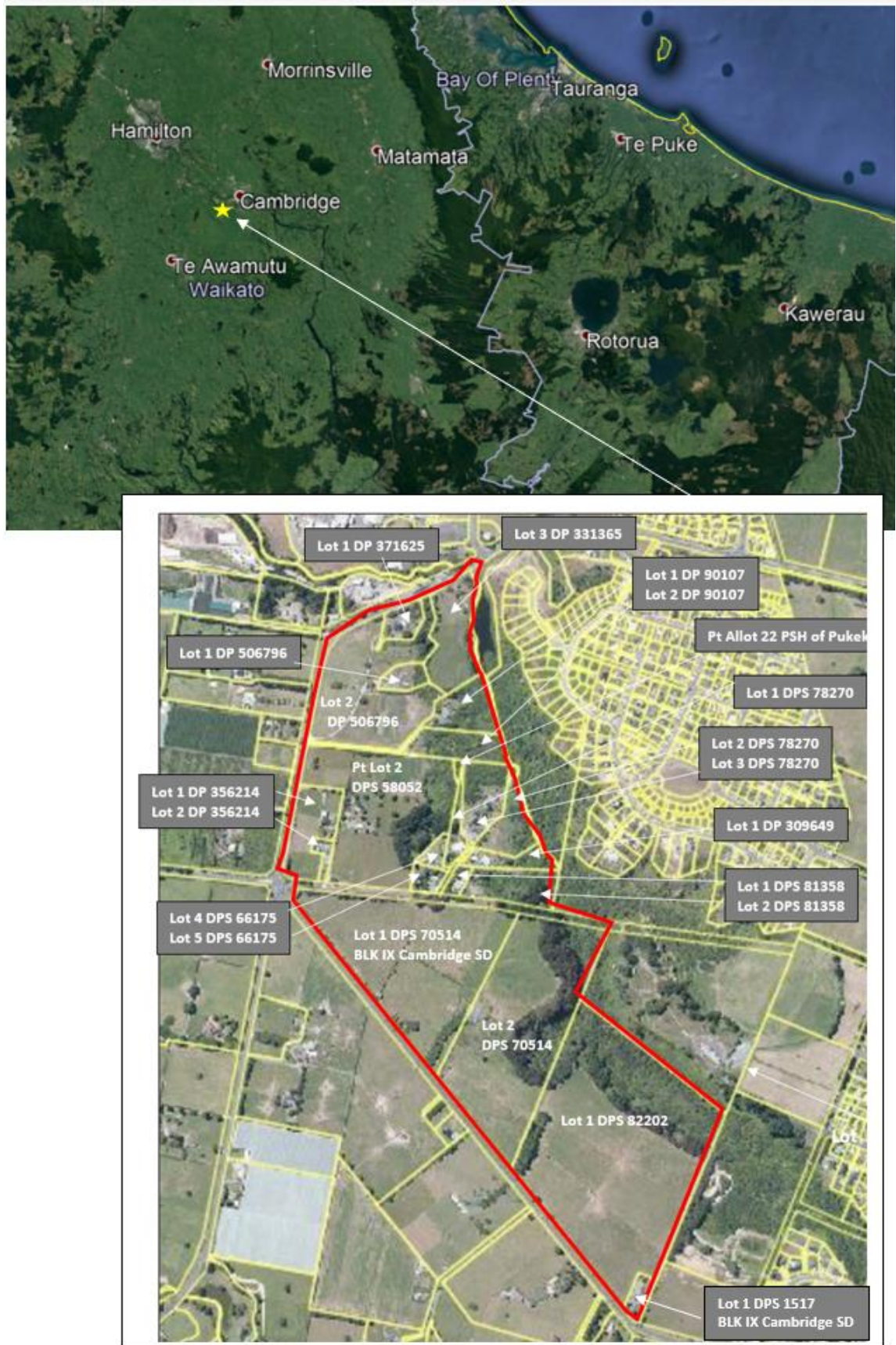


Figure 1. Upper aerial showing the regional location of Growth Cell C4 and lower showing the properties in Growth Cell C4 (source: upper GoogleEarth and lower Waikato District Intramaps)

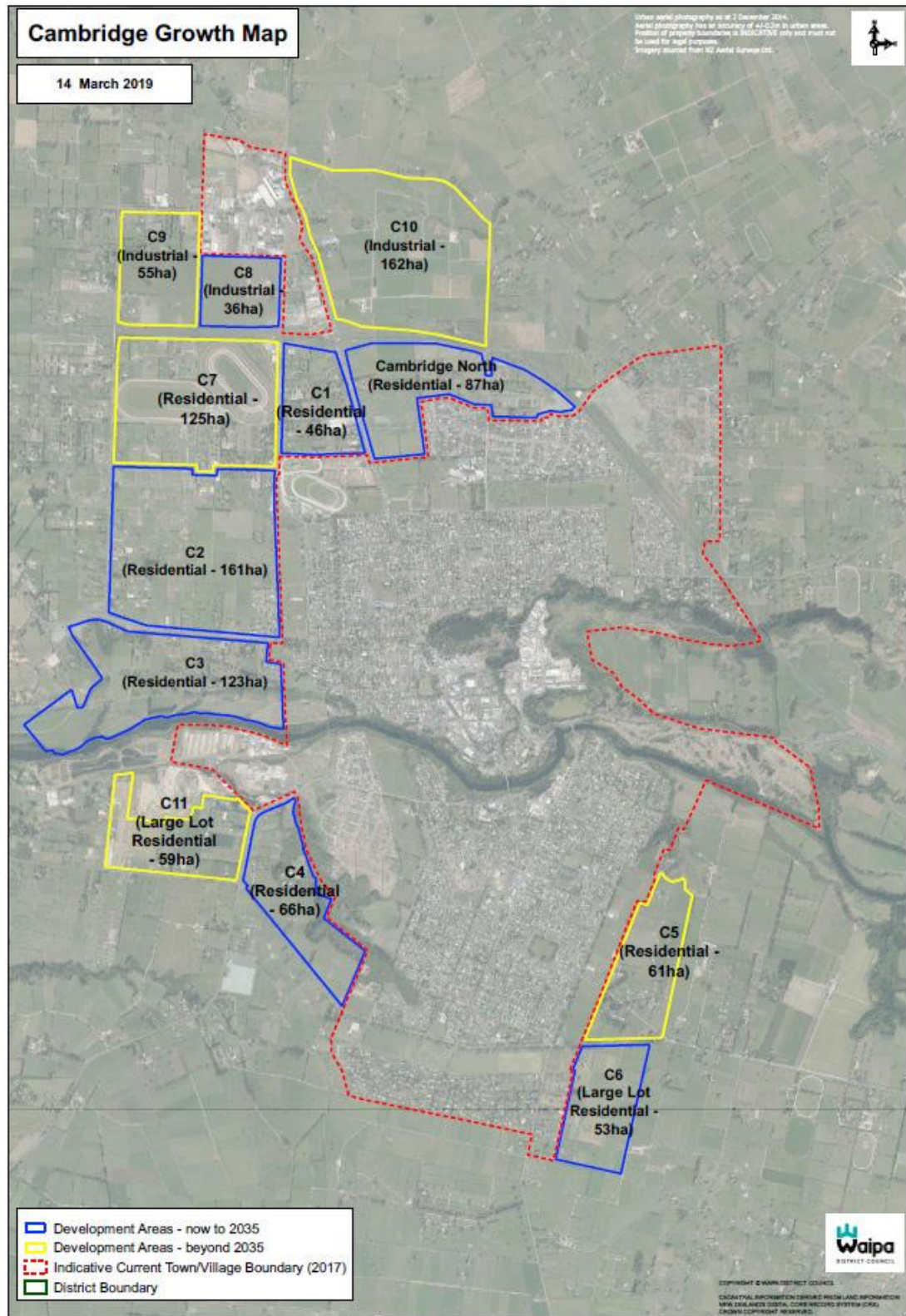


Figure 2. Cambridge growth map showing the development areas including Growth Cell C4 (Waipa District Council)

Table 1. Addresses and legal descriptions of properties within Growth Cell C4

Address	Legal Description	Area (ha)
9 Silverwood Lane	Lot 2 DP 356214	0.25
1/35 Silverwood Lane	Lot 5 DPS 66175 (1/8 SH in Lot 3 DPS 78270)	0.37
2/35 Silverwood Lane	Lot 1 DP 309649	0.71
3/35 Silverwood Lane	Lot 4 DPS 66175 BLK IX Cambridge SD (1/8 SH in Lot 3 DPS 78270)	0.30
4/35 Silverwood Lane	Lot 2 DP 309649/ Lot 3 DPS 78270	1.24
5/35 Silverwood Lane	Lot 1 DPS 78270 (1/8 SH in Lot 3 DPS 78270)	0.46
7/35 Silverwood Lane	Lot 2 DPS 78270 (1/4 SH in Lot 3 DPS 78270)	1.44
36 Silverwood Lane	Lot 2 DPS 81358	1.46
37 Silverwood Lane	Lot 1 DPS 81358	0.25
3796 Cambridge Road	Lot 1 DP 506796	0.50
3796A Cambridge Road	Lot 1 DP 371625	0.61
3838 Cambridge Road	Lot 3 DP331365	2.23
3774 Cambridge Road	Part Lot 2 DPS 58052	7.39
1/3774 Cambridge Road	Lot 1 DP 356214	1.74
3784 Cambridge Road	Lot 1 DP 90107	1.43
3794 Cambridge Road	Lot 2 DP 90107	1.37
n/a	Part Allot 22 PSH of Pukekura	0.074
37 Lamb Street	Lot 1 DPS 70514 BLK IX Cambridge SD	9.67
121 Lamb Street	Lot 1 DPS 1517 BLK IX Cambridge SD	0.40
n/a	Lot 2 DPS 70514	10.21
n/a	Lot 1 DPS 82202	17.06
3798 Cambridge Road	Lot 2 DP 506796	5.60

HISTORICAL BACKGROUND

Maori Settlement

In oral tradition the Tainui canoe, captained by chief Hoturoa made its final landfall at Kawhia some 800 years ago. The canoe had travelled around various parts of the central North Island, including the Bay of Plenty, the Coromandel, the Manukau Heads and the Hauraki Gulf, with some people leaving the voyage and settling in these areas (Te Ara Website).

Hoturoa is said to have made his base at Kawhia and over the years the Tainui people expanded inland from there. This included movement into the Waikato and Maori settlements spread throughout the region, with many concentrated along the coast to exploit the rich resources available there. Further inland, settlements were made along navigable waterways, such as the Waikato and Waipa Rivers and their tributaries, with numerous pa sites identified as well as gardening and food storage sites. Intertribal conflicts occurred periodically as a result of alliances, disputes and competition for resources.

During the early years of the 19th century contact with European traders and missionaries increased, one result being the introduction of muskets into Maori intertribal conflicts. The northern tribes were the first to arm themselves in this way and gained some advantage in battles with tribes who had not obtained such weaponry. However, by the 1830s most tribes were more or less equally equipped and were unable to sustain the long-term and large-scale warfare often referred to as 'The Musket Wars' that had occurred over the previous two decades.

The New Zealand Wars

In the years that followed, European influence increased and conflicts between Maori and the colonial government over the European demand for land became an ongoing issue, resulting in open conflict by the early 1840s. Contentious land sales, and the demands of settlers for land that was not properly secured, continued to result in conflicts and in 1845-46 these were centred in the north. However, confrontations between Maori and government forces continued with skirmishes, raids and battles taking place to the south, in the Hutt Valley and Wanganui in the late 1840s (Cowan 1955: 100-103; 143-144).

Tensions between Maori and the government continued to worsen and in 1858 resulted in the founding of the King Movement (Kingitanga) in the Waikato. This movement aimed to unite Maori under a single leader to strengthen their ability to oppose the loss of their land from the growing demands of the ever-increasing number of European settlers arriving in New Zealand (Belich 1986).

The Waikato, with its proximity to Auckland and now as the seat of the King movement, was a concern to the government and on 11 July 1863, the governor of New Zealand, Sir George Grey, issued an ultimatum to the chiefs of the Waikato, ordering that they pledge allegiance to Queen Victoria or face the consequences. Without providing adequate time for the Maori leaders to respond, on 12 July, British forces marched into the territory of the Maori King, crossing the boundary (aukati) between the Pakeha and Maori lands and marking the beginning of the Invasion of the Waikato (Belich 1986; New Zealand History Website). The Waikato campaign lasted for nine months and ended with the Maori defeat at Orakau Pa in April 1864. At this time, a new boundary (autaki) was established south of

the Punui River, leaving the land to the north in the hands of the government (Cowan 1955: 408-410).

The Waikato Militia and Military Settlement

Just after the outbreak of hostilities in the Waikato, the government had devised a scheme to form militia regiments that would provide a population base for military settlements in the Waikato once the government had taken control of the area (Allen 1969:33). The settlements were intended to prevent further unrest within the Maori population by establishing a larger European presence in the area and to guard from further attacks from the Kingites living to the south of the Punui River (Cowan 1955: 412). Many of the soldiers were recruited from the gold fields of Otago and Australia with the main incentive to join up being the provision of a one acre town allotment and a larger farm allotment (50 acres in size for the lower ranks and larger ones for the officers) to each soldier after completing three years of military service. Enlistment began in August 1863 with the men being divided into the four Waikato regiments (Allen 1969:35). The land for the settlements was to be confiscated from the Maori by the government and by mid-1864, military settlements were being planned at four locations in the Waikato at Alexandra (later renamed Pirongia), Kihikihi, Hamilton and Cambridge. The sites were chosen as defensive positions and to overlook the Waikato and Waipa Rivers. As the settlements were intended to be self-sufficient, it was also important that the sites chosen contained enough surrounding land suitable for farming. The strategic importance of the sites, in most cases, however, outweighed other factors and in the case of Cambridge, its location was ultimately decided as it guarded the head of navigation on the Waikato River (Allen 1969: 47).

The settlement at Cambridge was established in July 1864 and the site soon became the headquarters of the Third Waikato Regiment. Construction works on redoubts soon commenced. The first was the Star Redoubt which was located within the settlement at Cambridge. Pukerimu was had been used as a landing place by the British military from early 1864 saw the construction of two redoubts, one on each side of the Waikato River. The redoubts were only used for a very short period and were abandoned by the end of 1864 (Cambridge Museum Website).

Whilst the soldiers were put to tasks of building facilities, including the redoubts, surveyors were at work laying out the new settlement in one-acre town allotments and larger farm allotments in the surrounding area. The town allotments were laid out in rectangular grids situated around the two redoubts, one on each side of the Waikato River. The farm allotments were intended to spread out from the edges of the town but were planned to be kept as close to the town as possible for defensive reasons. Unfortunately, the military settlement process at Cambridge did not run particularly smoothly, as noted in the in the 29 November 1864 Edition of the *Daily Southern Cross*:

‘Cambridge is laid out on both sides of the Horotiu River, about 30 miles above Ngaruawahia, and is the headquarters of the third Waikato Regiment. There are about 600 men up here at present. The town is laid out in one-acre allotments, and the surveyors are busy laying out the roads for the fifty-acre allotments, and yet the men of this regiment have not got any of the acre allotments given to them, although the township has been surveyed these last two months. It is not possible, therefore, for anyone to make improvements on his acre. We hear that the men of the 2nd Regiment have some of their land in potatoes and other crops, but there is nothing of the kind here.’

The town lots were eventually provided to the men, but more problems arose with the farm allotments, the main one being an abundance of swamp land. The size of the farm lot

granted was dependent on the rank of the soldier, with privates receiving 50 acre lots, corporals 60 acres, sergeants 80 acres, subalterns 200 acres, 250 acres for surgeons, 300 acres for captains and 400 acres for field officers. The farm blocks were laid out in 50m units and the higher-ranking men would choose the appropriate number of blocks to make up their allotment, apart from the 60 and 80 acre farms for corporals and sergeants which were laid out separately (Allen 1969:76). Many of the lower ranking men received 50 acres of poor-quality swampy land and as many had no previous farming experience, the process of creating farms proved too difficult to manage and many sold their land as soon as their military service was finished, or in some cases they sold the land and transferred the military service to the new owner.

Information from Early Maps and Plans

Plans of the area containing Growth Cell C4 were reviewed to gain additional information on land ownership and use from the time of the establishment of the military settlement farms. The plan in Figure 3 shows the military settlement around Cambridge as it was originally laid out and as can be seen on the plan, the land in Growth Cell C4 lies to the west of a stream, which is situated in a deep gully and the irregular layout boundary was based on the topography. As can be seen in Figure 4, the land in the southern part of Growth Cell C4 was granted to William Howie (Allot 25) and the northern part to J.J. Dillon (Allot 23). William Howie was born in Scotland around 1841 and was enlisted as a substitute soldier in the Third Waikato Regiment in 1866. He farmed land at Pukerimu until the mid-1890s and passed away in 1918 and is buried at Ohinemuri. Joseph John Dillon was born around 1845 and enlisted as a private in the Third Waikato Militia in November 1863 with his profession was listed as settler/butcher (Cambridge Museum Website).

The plan in Figure 4 also contains information on two other properties in Growth Cell C4. The first is Section 25A, which lies to the southeast of Howie's and has the name John Wilson written on it. Wilson was born in 1830 in Scotland and was a major in the Third Waikato Militia. He received 400 farm acres and 2 town acres in the military settlement at Cambridge. He also acquired additional tracts of land and acted for the government in purchasing large tracts of land in the Waikato. He died at the age of 62 in 1892 (Cambridge Museum Website). The second is Section 24, which has the name W. Soutter written on it. William Soutter is listed as a member of the Third Waikato Regiment, however, no additional information was able to be gathered regarding him, although it is likely he was granted the land as a military settler.

The map in Figure 4 also shows the route of a dray track that would most likely been used for the transport of goods by horse drawn wagons to and from Cambridge running through the southern part of Growth Cell C4. With regards to Section 24, the plan in Figure 5 dating from 1905 and surveyed for a Mr William Atkinson shows subdivision of this lot along with Section 25A. The plan shows the northern border of the lot as swampy and also has an annotation of 'very old ditch bank and hedge' along the western boundary line between Section 25 and Section 25A.

A later plan in Figure 6 dated 1952 shows the transfer of a small rectangular lot in the southeast corner of Growth Cell C4, namely, Lot 1 DP 1517. The date of the original subdivision has not been determined, but it can be seen on the 1905 plan in Figure 5, although this may have been added to the plan at a later date. A much more recent plan dated 1995 (Figure 7) shows the subdivision of Allotment 25 into Lot 1 and Lot 2 as it exists today (with the annotation Pleasanton Stud Ltd on Lot 1 and also on land to the southeast).

In general, the old plans show that apart from the early subdivision of the small lot in the southeast corner, the southern part of the growth cell (to the south of Silverwood Lane) has remained agricultural in nature. To the north of Silverwood Lane, plans dating from the late 20th century show the subdivision of the area at the eastern end of Silverwood Lane into residential lots, with the remainder being subdivided into large lifestyle lots (Figure 7–Figure 10).

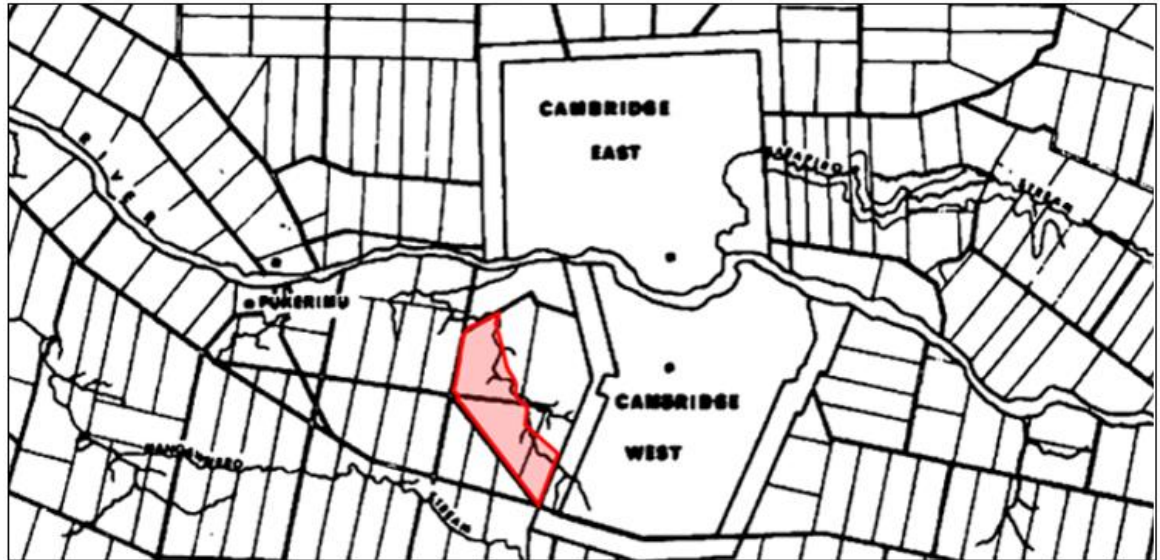


Figure 3. Plan of the militia farm allotments around Cambridge with Growth Cell C4 shaded red (source: Allen 1969)



Figure 4. Detail from HN SO 33 2 I dated late 1860s, showing the land ownership in the Growth Cell C4 (shaded red) with old dray track indicated by arrow (source: Quickmap)

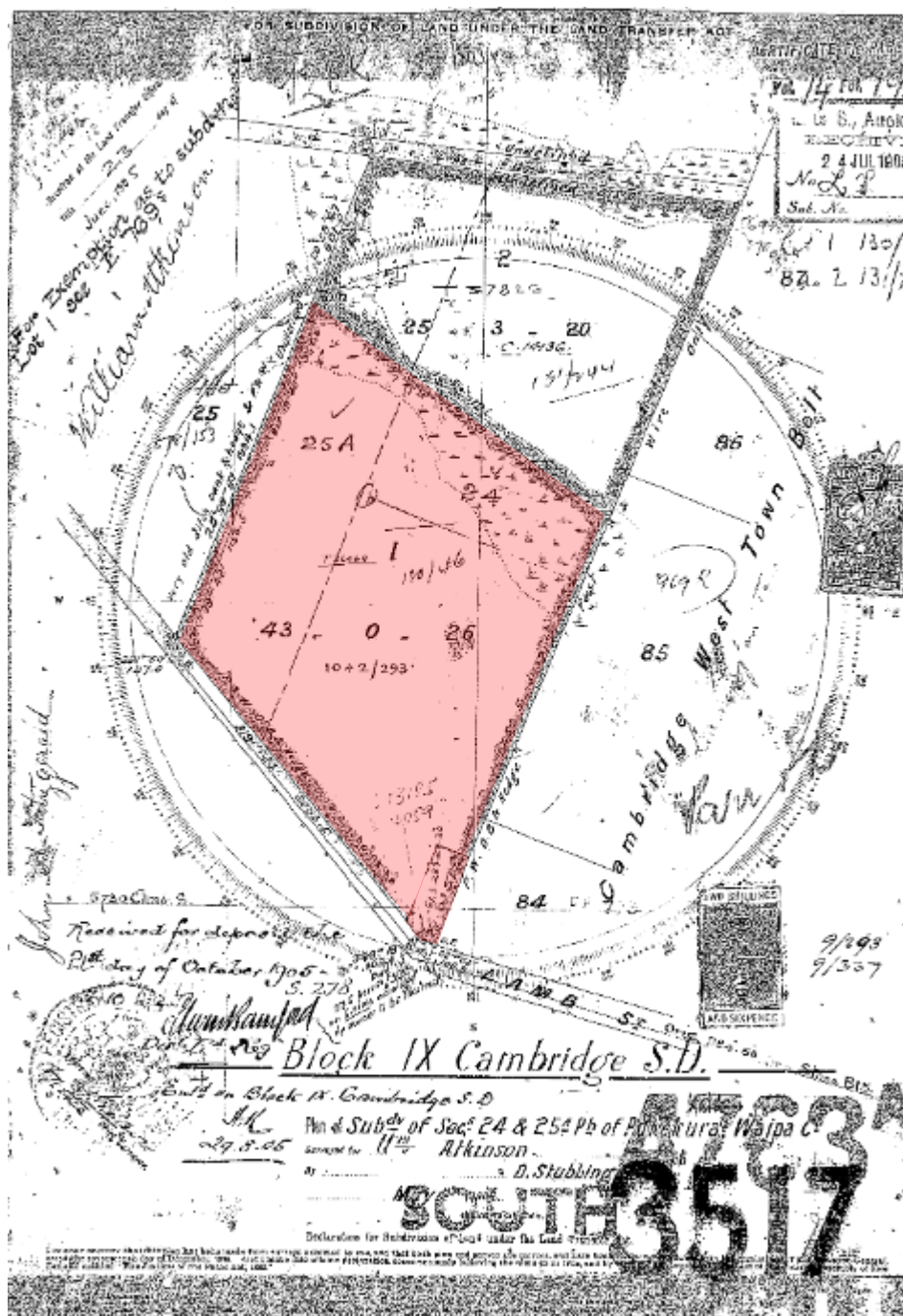


Figure 5. HN DP 3517 I dated 1905 showing the subdivision of Sec 24 and 25A, with the land in Growth Cell C4 shaded red (source: Quickmap)

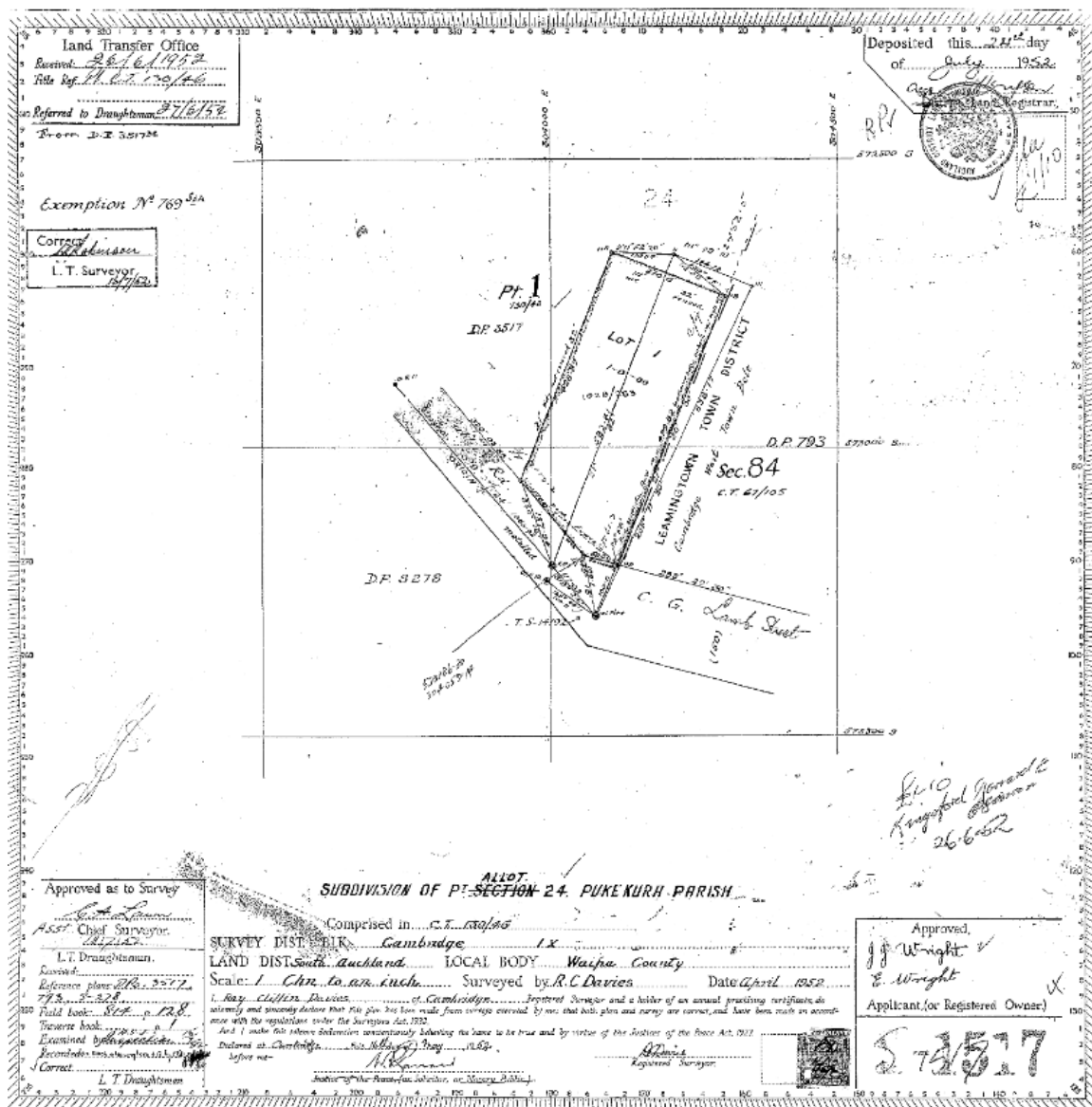


Figure 6. Land transfer plan dated 1952, showing the small rectangular lot in the southeast corner of the growth cell (source: Quickmap)

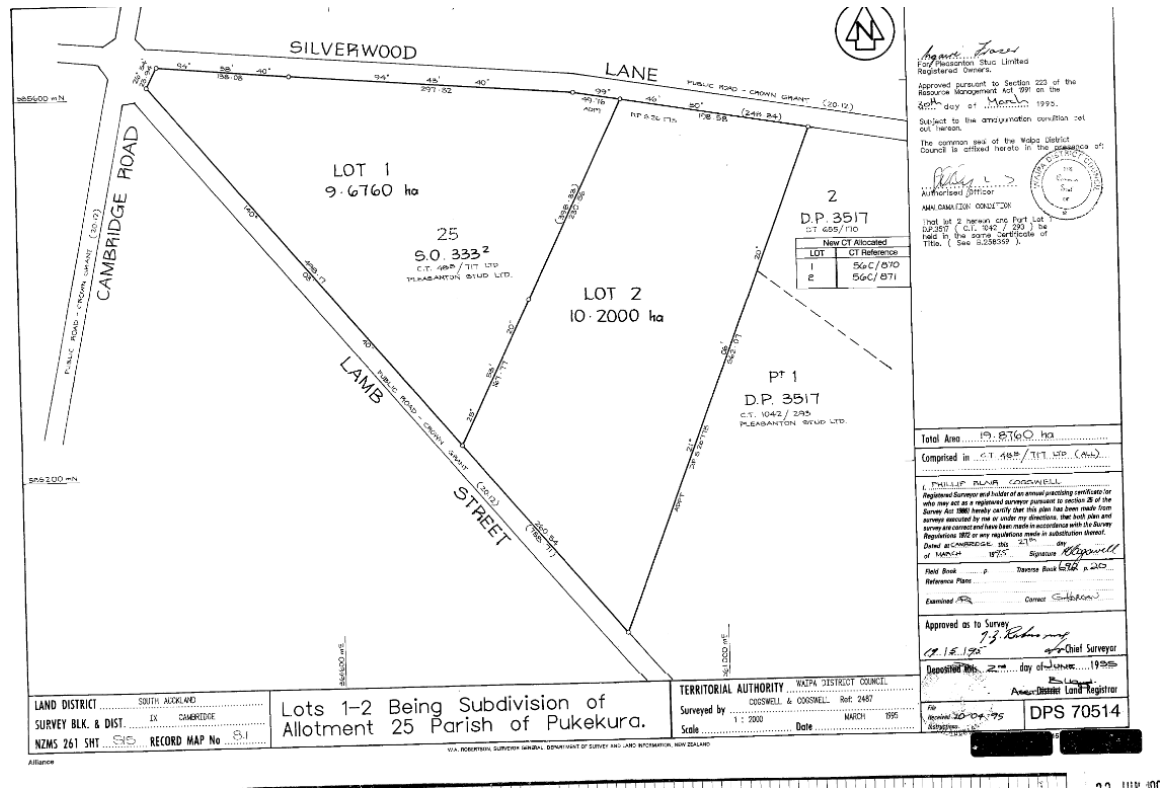


Figure 7. HN DPS 70514 dated 1995, showing the subdivision of Allotment 25 into two lots (source: Quickmap)

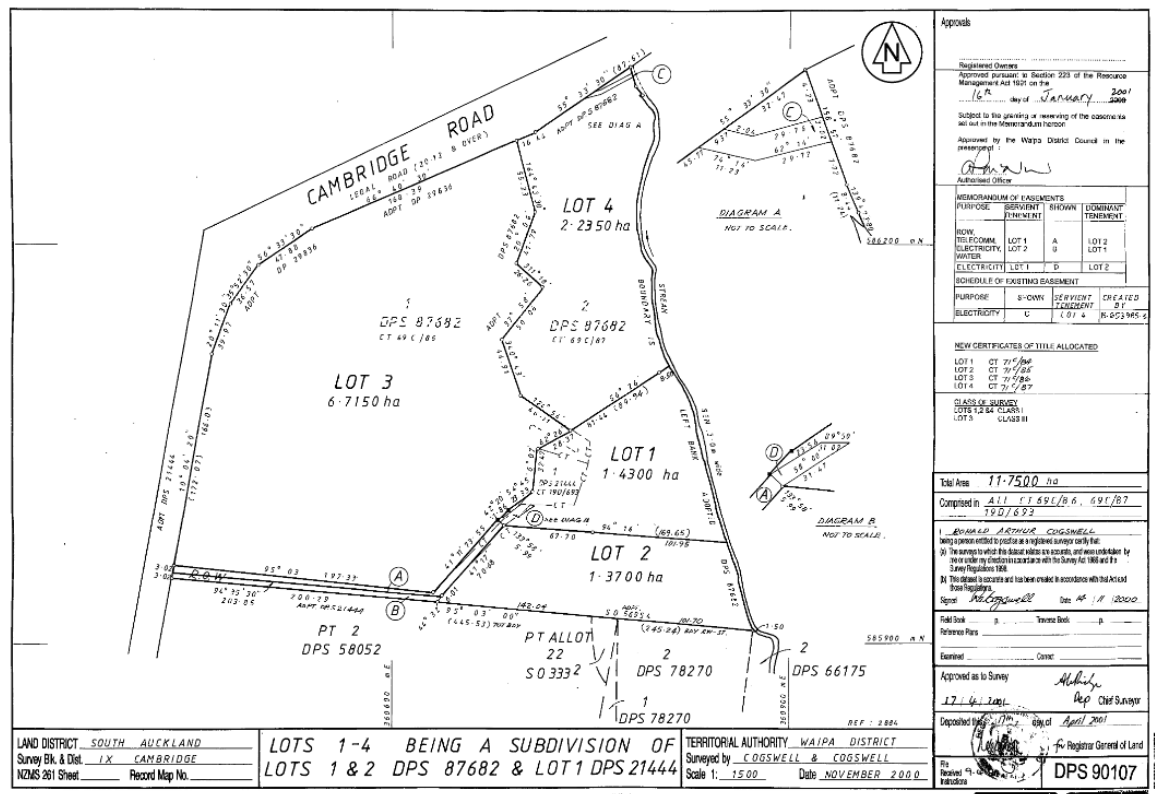


Figure 8. HN DPS 90107 dated 2000, showing the subdivision of lots in the northwest corner of the growth cell (source: Quickmap)

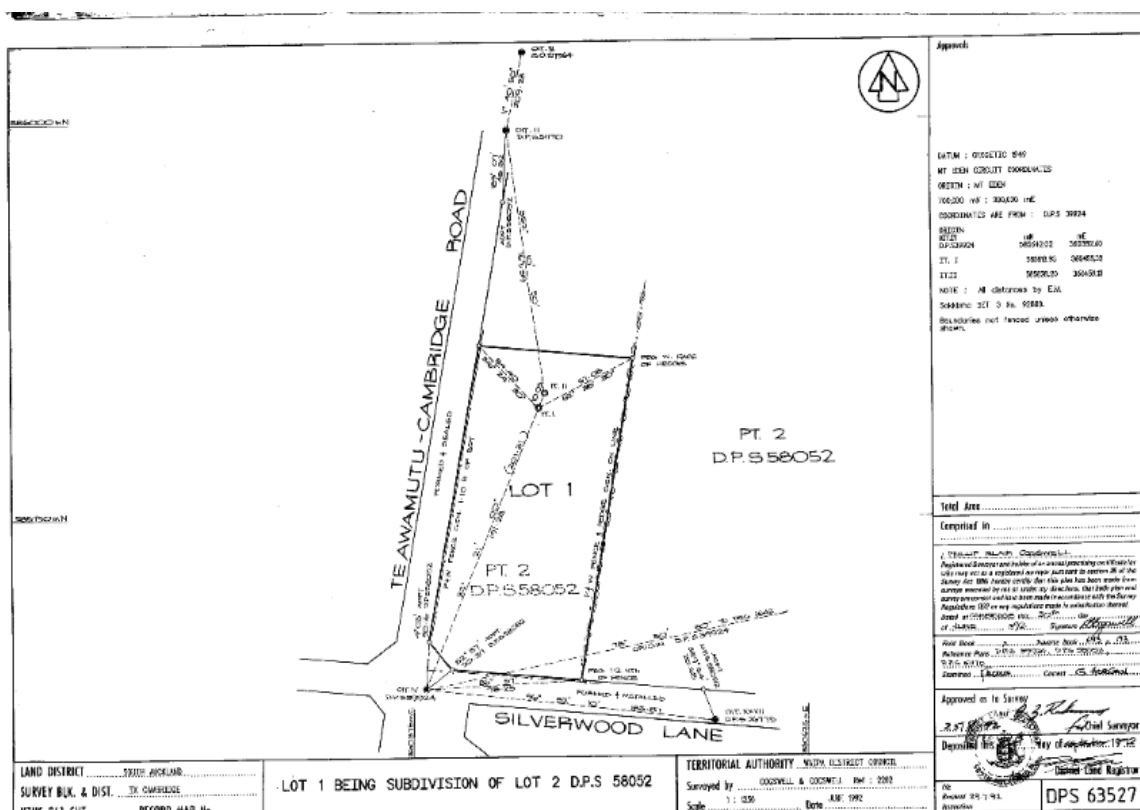


Figure 9. HN DPS 63527 dated 1992, showing the subdivision of the just to the north of Silverwood Lane at the Junction of Te Awamutu – Cambridge Road (source: Quickmap)

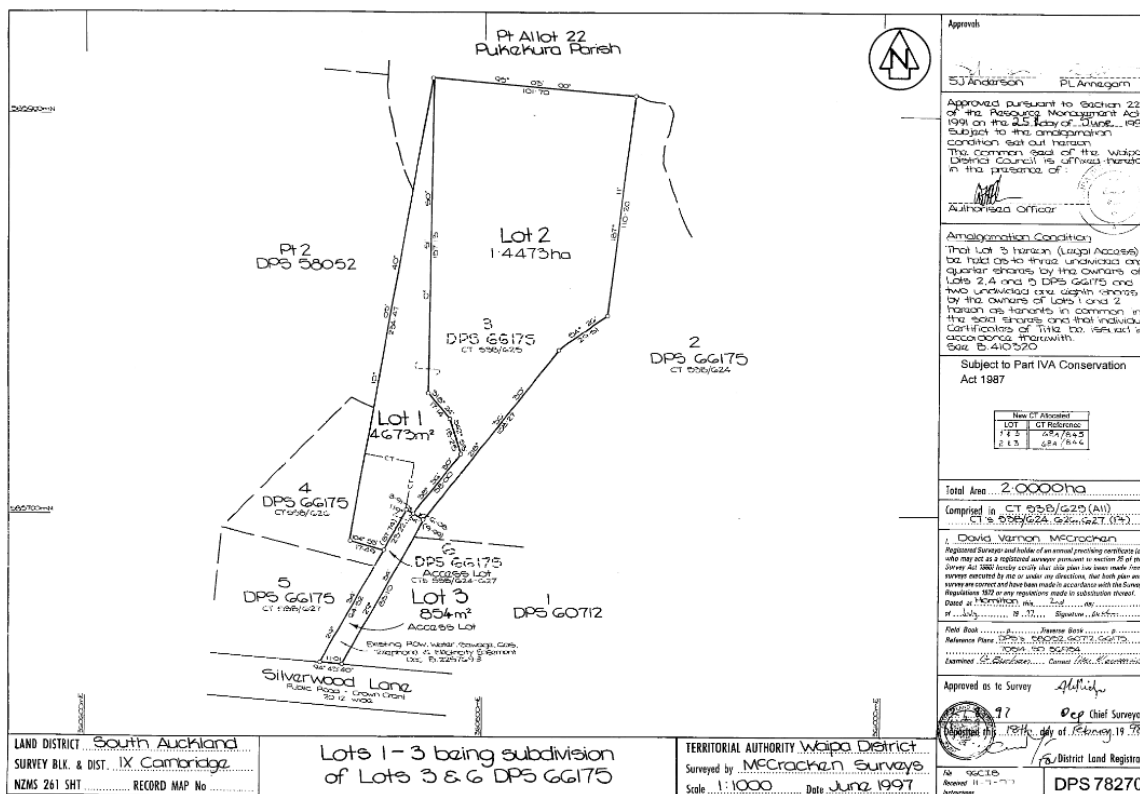


Figure 10. HN DPS 78270 dated 1997 showing the subdivision for residential lots to the north of Silverwood Lane (source: Quickmap)

ARCHAEOLOGICAL BACKGROUND

Recorded Archaeological Sites

There are six recorded archaeological sites in Growth Cell C4, all of which are associated with Maori horticulture and settlement. The locations of the sites are provided in Figure 11 and a brief description in Table 2. S15/23 is a pa site situated on an east facing headland with steep banks on the north, south and east sides. The site was described in 1973 as square in shape (45x45m) with house platforms, terraces and a ditch on west side (filled in). At that time the site was ploughed out and in grass. A house was constructed on the site c.1980 and a site visit in 2014 confirmed that most of the site has been severely damaged/destroyed by the house construction and associated landscaping, although the ditch is believed to have survived (NZAA site record, appended).

The other five recorded archaeological sites are borrow pits and associated modified gardening soils. Borrow pits and gardening soils are common features in the archaeological landscape of the Waikato. The pits were dug to collect sands and gravels that were present below the upper soil layers. The extracted material was then added to the topsoil to modify the soil for gardening. The purpose of this was to improve soil quality (drainage, friability) for the cultivation of plants brought to New Zealand from warmer climates by Maori. Borrow pits are often found in proximity to gardening soils and it has been noted that the pits were often located near to the gardening areas (Walton and Cassels 1992: 166). Two of the sites in Growth Cell C4, S15/521 and S15/638 have been recorded to the west of the pa site (S15/23). These sites were visited in 2014 and five borrow pits were identified along with modified garden soils, as shown in Figure 12. The notes from this site visit indicated that S15/521 and S15/638 likely represent the same pre-European Maori horticultural site, although the two site references are still in use (NZAA site records, appended).

S15/637 is located further to the south and was identified from inspection of aerial photographs and has not been visited in the past. This site was originally recorded as a single borrow pit to the north of Silverwood Lane, however, more recent Lidar data would indicate that a larger number of borrow pits are present, both to the north and south of Silverwood Lane (Figure 13). The remaining two borrow pit sites in Growth Cell C4 have been recorded in paddocks to the south of Silverwood Lane. These are S15/701 and S15/702, which are described as containing 30 borrow pits each on the NZAA site records, but no additional information has been provided apart from a note that the record was intended to be updated in 2013. All of the above NZAA site records have been appended to this report for reference.

An additional 11 archaeological sites have been recorded outside of the Growth Cell C4 boundary at distances up to c.300m of that boundary. These sites will be described below to provide an overview of the general archaeological landscape setting of the project area. Ten of the sites are associated with Maori settlement and horticulture with the remaining one being the site of a historic homestead. The latter, S15/757, was the homestead of the Tucker family from the late 19th century. No surface evidence was found during a 2016 site inspection, but it is considered likely that subsurface material associated with the farm could be present (NZAA Site Record). Of the remaining 10 recorded archaeological sites, one is a pa site, S15/356. This site, which is located on a c.70 m long headland, was recorded in 1973 and it was noted the site was badly eroded at that time. The site was described as being cut off by a 60m long transverse ditch containing two terraces and numerous indentations interpreted as pits.

The nine other recorded sites are all borrow pit sites, with some containing associated modified gardening soils. Two of the sites, S15/700 and S15/703, described as containing two and five borrow pits respectively, were entered into the NZAA ArchSite database in 2013 with a note in the site record that they would be updated, but no additional information has been added. Five sites were identified on 1943 aerial photographs and have not been visited to date, these are: S15/287 (12 borrow pits), S15/520 (nine borrow pits), S15/522 (three borrow pits), S15/526 (four borrow pits) and S15/640 (a single borrow pit).

The final two sites, S15/639 and S15/641, are located c.200-300m to the east of Growth Cell C4. Both sites were originally recorded as containing a single borrow pit each from inspection of aerial photographs. Site visits have been undertaken and a total of three borrow pits have been identified at S15/639 and one borrow pit at S15/641, along with modified gardening soils. As well, material recovered from these sites has been submitted for radiocarbon dating with results indicating mid-14th century dates, which are at present some of the earliest dates recorded in the Waikato (Gumbley and Laumea 2018:16).

Archaeological Landscape

The recorded sites within and around Growth Cell C4 indicate that it was part of a broader Maori horticultural landscape located on both the northern and southern sides of the Waikato River. In general, the Waikato District contains a large number of archaeological sites, with the majority being located along the coast or in the vicinity of major waterways. The main site types that have been recorded are Pit/Terrace, Pa, Midden/Oven and Borrow Pits (Hutchinson and Simmons 2016:17). Previous research and investigations have revealed past Maori occupation with both pa sites and sites associated with Maori horticulture predominating, and with many of these sites clustered around the Waikato River. This clustering would appear to be the result of location preference, but has also been influenced by the focus of past archaeological surveys and investigations (Campbell 2012: 18-20). As noted by Campbell, there is also currently not enough available data to reconstruct the temporal progression of occupation in the wider Waikato Basin and the date of the first occupation has not been established (Campbell 2012:57). As noted above, the earliest radiocarbon dates available would suggest a date from the mid-14th century at sites located to the east of Growth Cell C4 (Gumbley and Laumea 2018). The activities associated with early occupation are thought to have been forest clearance in desirable gardening areas, as evidence has indicated that the gardens were established in areas formerly covered by primary forest, which became fern land after the gardens were abandoned (Campbell 2012:58).

Past research and investigation of Maori settlement and gardening in the general area containing Growth Cell C4, including the identification and distribution of modified gardening soils and borrow pits, has been undertaken in an in-depth desk-based study of pre-European Maori horticulture conducted as part of the archaeological assessment for the construction of the Waikato Expressway – Tamahere to Cambridge Sections (Campbell 2012¹). The study area for that project is located to the north of the Growth Cell C4, but the findings are applicable to the wider area, including that of Growth Cell C4. One of the areas of focus for the study was a detailed analysis of soil types associated with Maori horticulture, with particular emphasis on modified soils created for gardening. The main

¹ As noted in the Campbell 2012 report the information on soils was gathered from the following sources: DSIR 1954, McLeod 1984 and Lowe 2010. It should be noted that the McLeod 1984 terminology is used in the current assessment report. For background information and a description of the development of soil classification, the Campbell 2012 report can be consulted.

type of soil on which pre-European gardening sites are recorded are Horotiu Sandy Loams. They are well drained soils found on the lower terraces of the Waikato River. They have been subdivided into Horotui coarse sandy loams (HS), Horotui sandy loam (H), Horotui silt loam (Hy) and (Hg) which also contains gravel (ibid.).

The soil in Growth Cell C4 is dominated by Horotiu sandy loams. An area of modified gardening soil (Tamahere) has been identified in the northern part of the growth cell in association with a number of borrow pits, just to the west of the pa site, S15/23. It is also considered likely that modified garden soils are located in other parts of the growth cell which have not been previously tested. Borrow pits have also been identified along the northern part of the growth cell (Figure 13). Although the southern part of the growth cell is not included in the area covered in Figure 13, borrow pits have been identified from inspection of old aerial photographs.

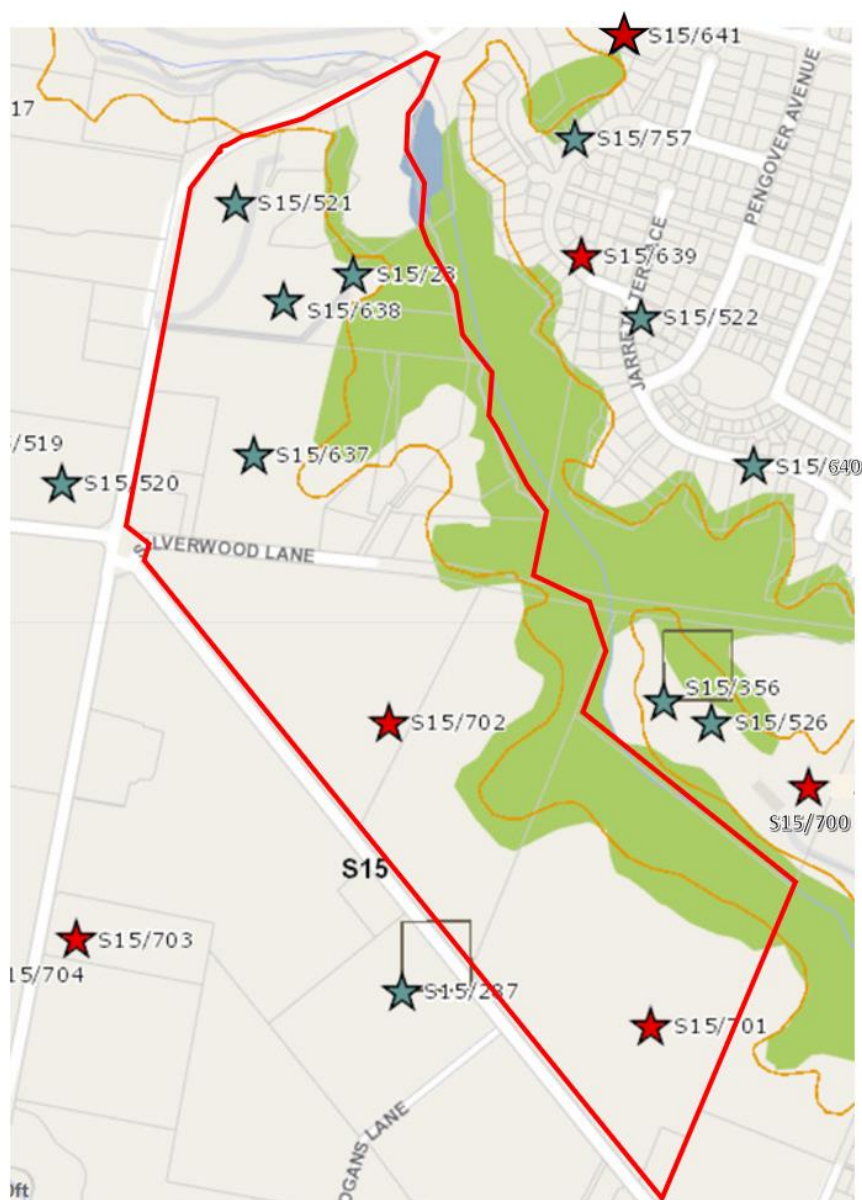


Figure 11. Plan showing the location of the recorded archaeological sites in growth Cell C4 and the surrounding area (source: NZAA Archsite Website)

Table 2. Brief description of the archaeological sites in and within 300m of Growth Cell C4. Those within Growth Cell C4 shaded in grey

NZAA #	Site Type	Description	NZTM Easting	NZTM Northing
S15/23	Pa	Roughly rectangular pa (50x50m) with transverse ditch, lateral pits and terraces. House on the site.	1815831	5802104
S15/287	Maori Horticulture	12 borrow pits (8-30 m across) identified during brief visit in 1983.	1815902	5801070
S15/356	Pa	Located on north pointing with transverse ditch, pits and terraces.	1816281	5801490
S15/520	Maori Horticulture	Nine borrow pits in an area of 310x50m. From 1943 aerial photograph SN266/835/59- not visited.	1815410	5801804
S15/521	Maori Horticulture	Five borrow pits in an area of 120x60m. From 1943 aerial photograph SN266/835/59 – not visited.	1815661	5802208
S15/522	Maori Horticulture	Three borrow pits in an area of 40x30 m. From 1943 aerial photograph SN266/835/60 – not visited	1816246	5802043
S15/526	Maori Horticulture	Four borrow pits in an area of 60x50m. From 1943 aerial photograph SN266/835/60 – not visited.	1816352	5801460
S15/637	Maori Horticulture	Single borrow pit from 1943 aerial photograph SN266/835/59- not visited.	1815686	5801845
S15/638	Maori Horticulture	Single borrow pit from 1943 aerial photograph SN266/835/59- not visited.	1815731	5802067
S15/639	Maori Horticulture	Two borrow pits and Maori modified soils- located in a new residential subdivision.	1816159	5802131
S15/640	Maori Horticulture	Single borrow pit from 1943 aerial SN266/835/60- located in a new residential subdivision.	1816408	5801829
S15/641	Maori Horticulture	Single borrow pit from 1943 aerial SN266/835/60- filled in with house constructed.	1816223	5801448
S15/700	Maori Horticulture	Two borrow pits - NZAA site record updated in 2013 but no further information provided.	1816492	5801366
S15/701	Maori Horticulture	30 borrow pits NZAA site record updated in 2013 but no further information provided.	1816264	5801020
S15/702	Maori Horticulture	30 borrow pits NZAA site record updated in 2013 but no further information provided.	1815883	5801460
S15/703	Maori Horticulture	Five borrow pits NZAA site record updated in 2013 but no further information provided.	1815429	5801146
S15/757	Historic Domestic	Tucker Homestead and farm – 19 th century. Subsurface remains likely.	1816150	5802300

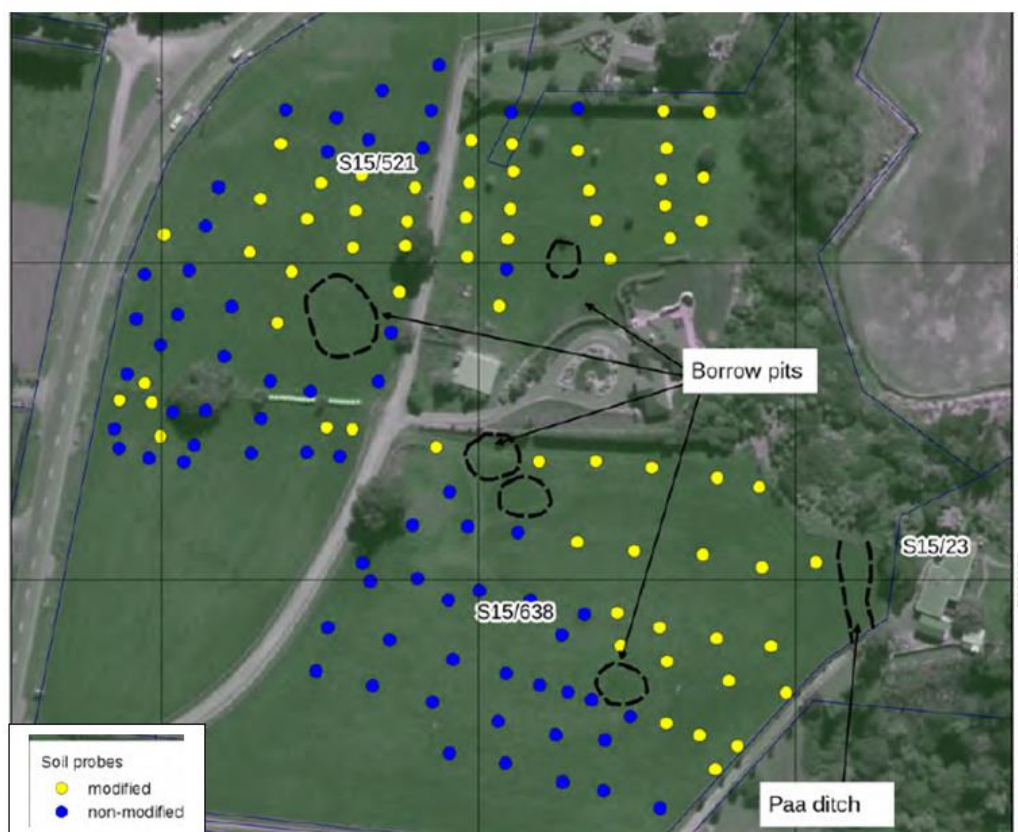


Figure 12. Aerial plan of the area containing Maori horticultural sites S15/521 and S15/638, showing locations of borrow pits and modified soil and also the pa site S15/23 with outline of surviving ditch indicated (source: NZAA Site Record)

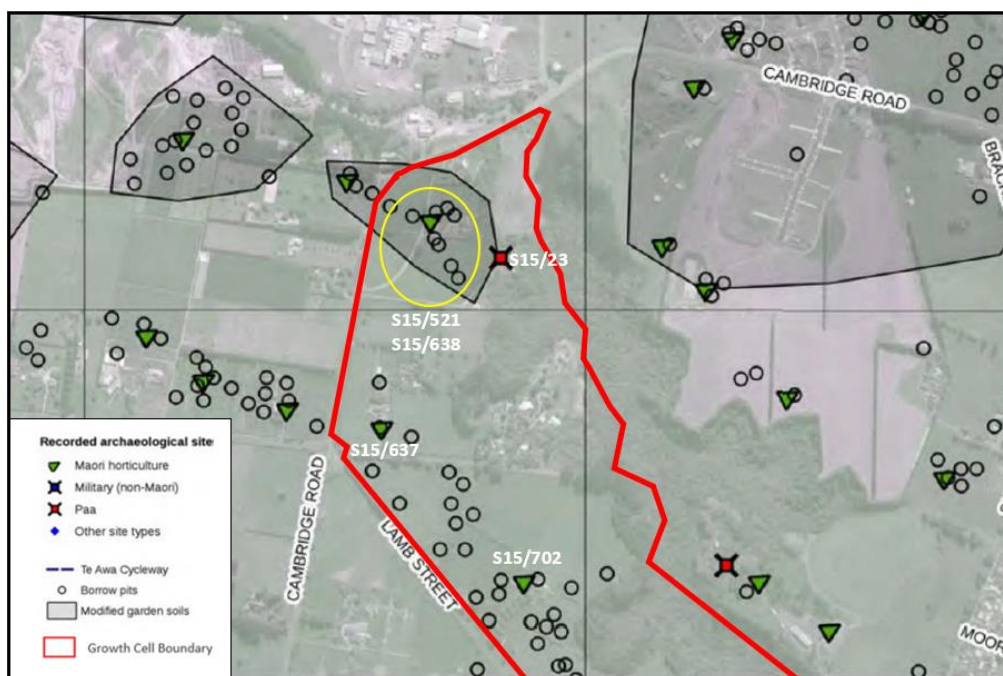


Figure 13. Aerial plan showing the location of archaeological sites and associated Maori horticultural features in the northern and central part of Growth Cell C4 (source: NZAA Site Record)

Information from Early Aerials

Aerial photographs have been reviewed in the past to identify the locations of the borrow pits in Growth Cell C4, some of which have been recorded as archaeological sites. As can be seen in the aerial photographs from 1943 in Figure 14 (northern section) and Figure 15 (southern section) depressions in the ground are clearly visible at several locations within the boundaries of Growth Cell C4 and the locations of the recorded archaeological sites are indicated in these figures. The location of a sand quarry at the eastern end of Silverwood Lane is also shown on the 1943 aerial photograph in Figure 14. The recorded pa, S15/23, is also clearly visible in the 1943 aerial, although as can be seen on the 1983 photograph in Figure 16, a house was subsequently constructed at this location.

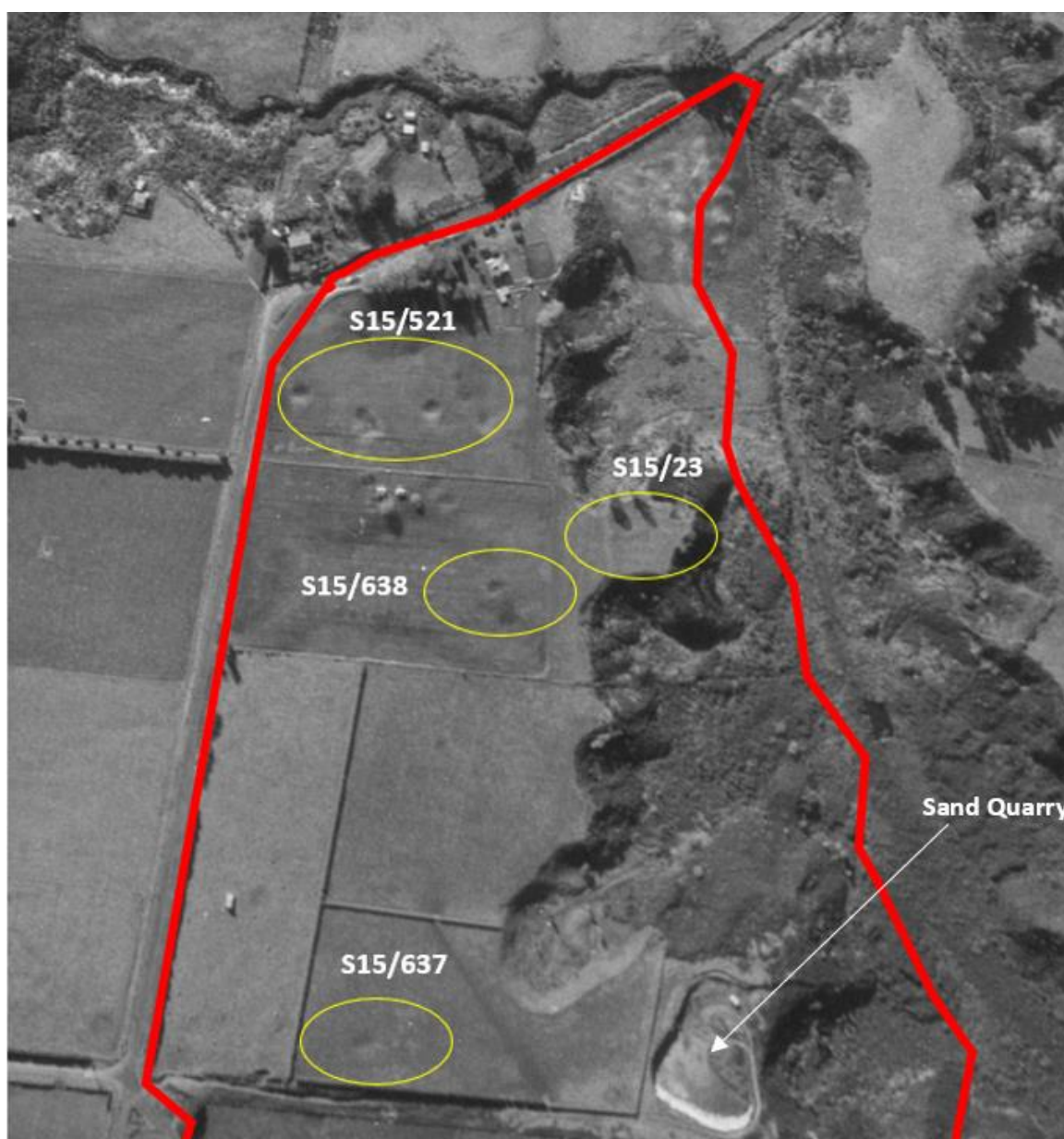


Figure 14. Aerial photograph dated 1943 (Crown 266 835 59) showing the northern part of Growth Cell C4 with archaeological sites circled in yellow and known sand quarry indicated (sourced from: <http://retrolens.nz> and licensed by LINZ CC-BY 3.0)



Figure 15. Aerial photograph dated 1943 (Crown 266 836 60) showing the southern part of Growth Cell C4 with the locations of the recorded archaeological sites circled in yellow (sourced from: <http://retrolens.nz> and licensed by LINZ CC-BY 3.0)



Figure 16. Aerial photograph dated 1983 (Crown 8178 C 16) with house construction at the location of pa site S15/23 shown in detail in upper inset (sourced from: <http://retrolens.nz> and licensed by LINZ CC-BY 3.0)

PHYSICAL ENVIRONMENT

Geology and Geomorphology

The geology of the Waipa region consists predominantly of volcanic material, including tephra. The geology of the region has been impacted by volcanic events, such as eruptions coming from the Taupo region, depositing large volumes of alluvial material (Waipa District Council 2008). Volcanic features can be found across the Waipa region, an example being Pirongia Mountain, a basaltic-andesite volcanic cone. Along with volcanic events, the region has been shaped by flooding events from the Waikato and Waipa rivers, carving out channels that can be found near the rivers.

The underlying geology of the area, including Growth Cell C4, is known as the Hinuera Formation, which is made up of volcanogenic alluvial deposits. The soil patterns on the Hinuera Formation mimic the earlier alluvial depositional activity with the more well-drained Horotiu soils found on slightly raised ancient channel and bar deposits and the lower-lying and more poorly drained soils (Te Kowhai, Ngaroto and Matangi) on ancient floodplains. The floodplains consist of silt, sand and gravel (the Hinuera Formation) deposited by migrations of the ancient Waipa and Waikato River systems over the past c.100,000 years with deposits up to 60m thick (Figure 17). These ancient alluvial deposits swept around an even older pre-existing hilly landscape, partially burying it and creating a mostly flat alluvial surface with only remnants of the older hills protruding in places (Lowe 2010). The last depositional episode was between 22,00 and 17,00 years ago and the deposits above the surface consist of numerous thin tephra layers (ibid.). Growth Cell C4 also contains an area of poorly drained soil in its central section and there is an area of Kirikiriroa soils, which are well drained steepland loams, along the eastern boundary, which contains steep sided gullies (Macleod 1992: 39-40).

Topography, Vegetation and Land use

Growth Cell C4 contains a mixture of agricultural land and large rural lifestyle blocks with the southern part (to the south of Silverwood Lane) being mostly farm paddocks, currently in use as a thoroughbred stud and formerly a dairy farm. There is also a house on the property set back from Cambridge Road.

The land to the north of Silverwood Lane has a mixture of open paddocks and lifestyle blocks. The majority of the land is relatively flat apart from the land along the eastern boundary, which slopes steeply down into a system of gullies and streams, and a low-lying section of land in the northeast corner (Figure 18). This figure also shows a number of small features in the southern and central paddocks of Growth Cell C4 which most likely represent the locations of borrow pits. As noted earlier, the land at the eastern end of Silverwood Lane was formerly used as a sand quarry. As can be seen in Figure 18, there is also a similar area to the northeast, which may also have been used as a sand quarry.

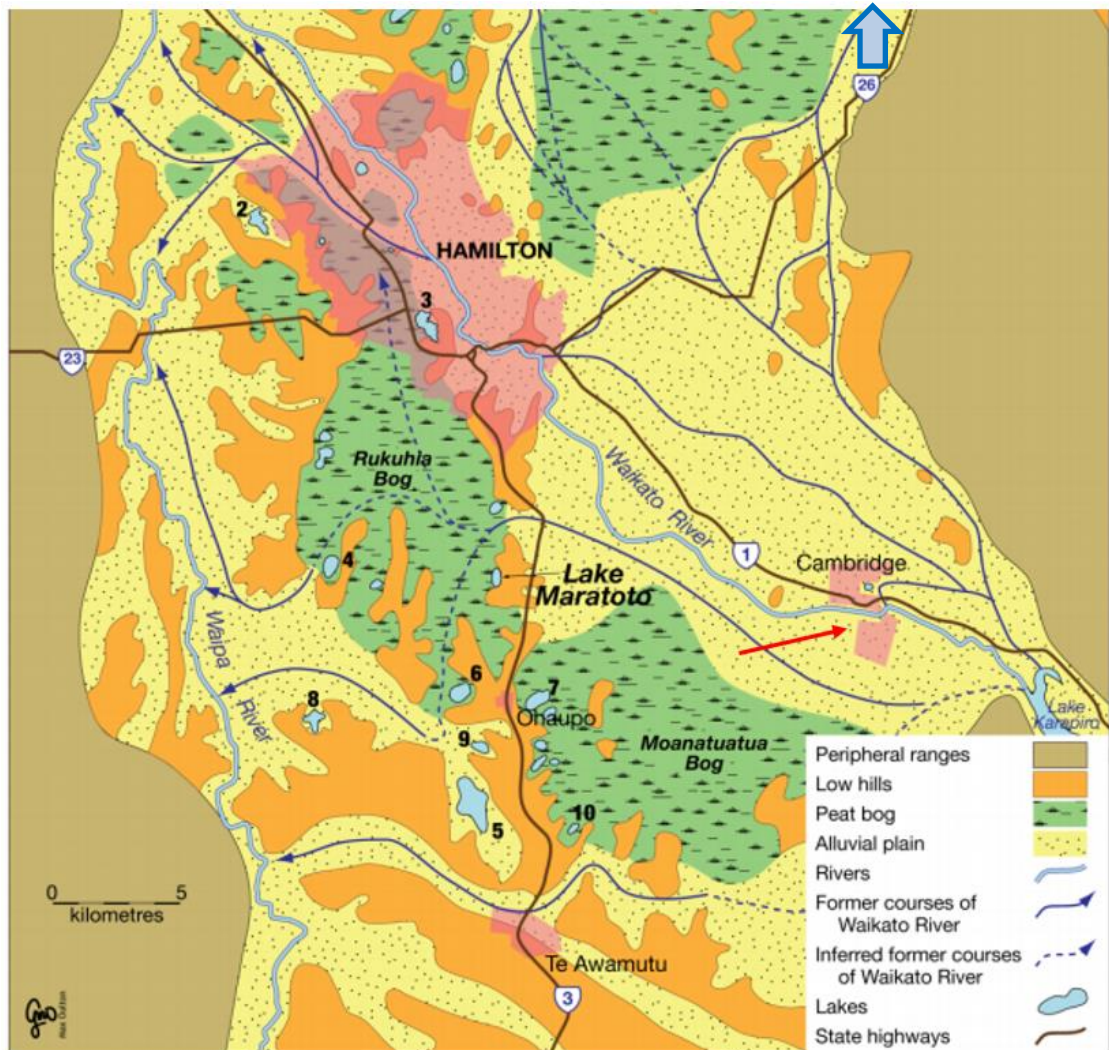


Figure 17. Map showing the modern landscape features in the central and southern part of the Hamilton Basin with approximate location of Growth Cell C4 shown by arrow (source: Lowe 2010)

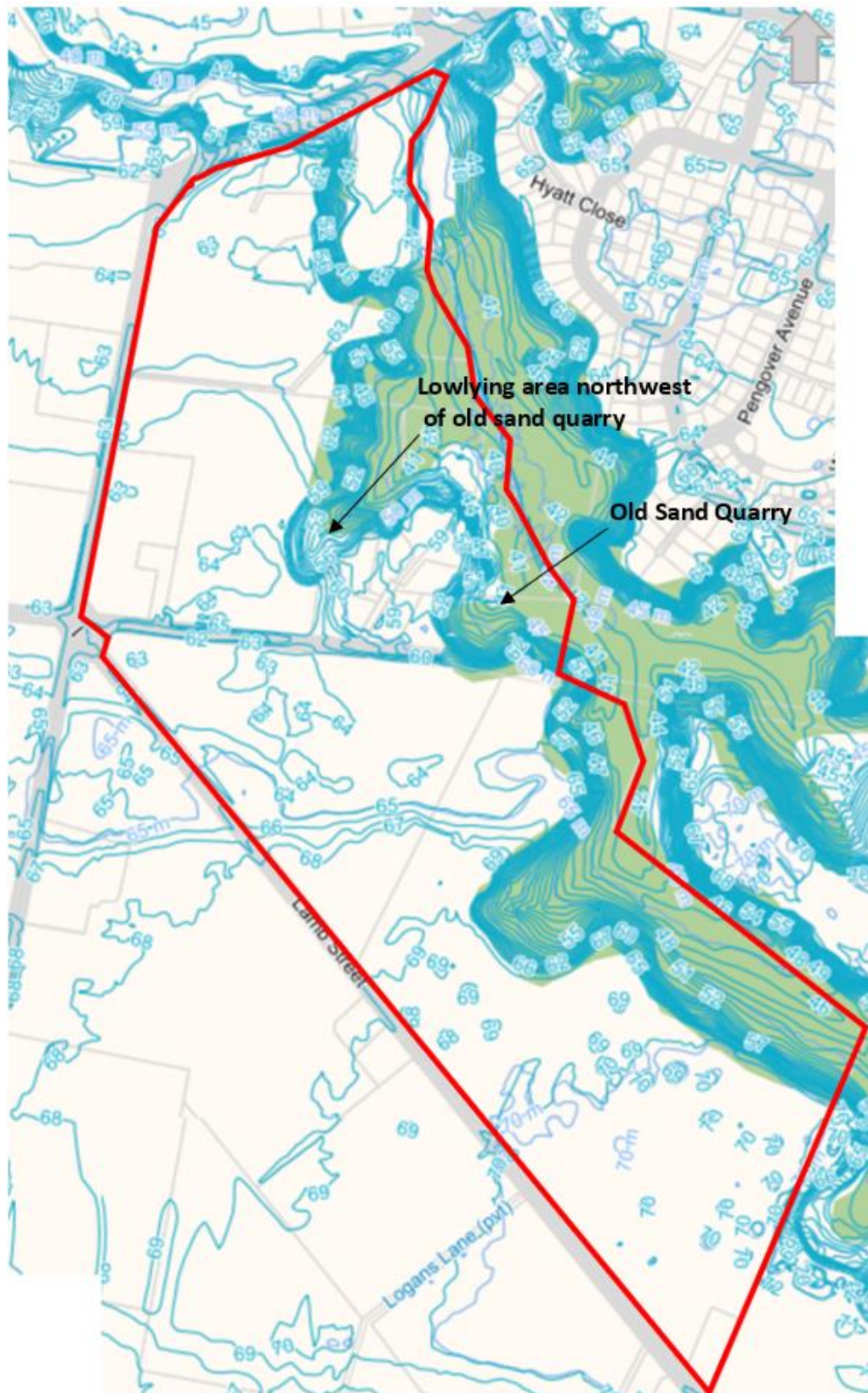


Figure 18. Map of Growth Cell C4 with contours (source: Waipa District Intramaps)

FIELD ASSESSMENT

Field Survey Results

A field survey was conducted on 25 July 2019. All of Growth Cell C4 to the south of Silverwood Lane was accessible, as were the large open paddocks to the north of the lane. As has been noted a large number of borrow pits have been identified from inspection of aerial photographs and recorded as archaeological sites. The purpose of this survey was to inspect the areas where the borrow pits have been identified and to determine if their presence could still be detected from visual inspection and probing. It should be noted that the results below are not intended to provide a comprehensive record of all of the archaeological remains that are present in the growth cell, but to indicate the current status and general condition of the archaeological sites at the current planning stage. Thirty-two previously unvisited borrow pits were able to be identified during the survey. Coordinates were taken and the locations have been plotted on the aerial plan in Figure 23 (below). The information gathered during the survey on the recorded features is provided in Table 3 and a summary of the findings for each of the archaeological sites is provided below.

S15/701

This archaeological site was previously recorded in the southernmost part of the growth cell. During the survey, the area was found to be located on fairly level grassland that had been divided into fenced paddocks and was being grazed by horses. A number of depressions were immediately noted, some with water at the base and some dry. The farm manager indicated that the horses tended to use some of the depressions for rolling in, making the bottoms of these depressions hard packed and prone to retaining water. Where the soil had not been compacted by such actions, the bases were dry. In general, waterlogging was not an issue on the property.

As noted earlier, the only information on the site record was that 30 borrow pits were present. During the survey the area was noted to have a number of very visible and large depressions and 18 were recorded as borrow pits. Smaller depressions, the origins of which could not be determined from visual inspection and probing were not recorded, but it is considered likely that after topsoil stripping evidence of more borrow pits would be revealed. In general, the pits ranged from c.8m x 10m to 20m x 30m in size, with visible depths ranging from 0.5m to over 2m. The shape of most of the depressions appeared to be roughly rectangular, although some had a more rounded appearance. In general, the land use impacts in this area are considered low with the borrow pits in a good state of preservation. A photograph is provided in Figure 19.

S15/702

This area, which lies to the north of S15/701, is dominated by grassed paddocks in use for horse grazing, but also contains a house and driveway and landscaped areas. Only six borrow pits were able to be confidently identified and recorded. Again, a number of shallow depressions were noted, but could not be positively identified as borrow pits, although it is considered likely that evidence of more borrow pits would be established after topsoil stripping.

S15/637

This site was originally identified during a review of aerial photographs and was described as a single borrow pit located to the north of Silverwood Lane (NZAA site record). More recent Lidar data has indicated a larger number of borrow pits in this area on both the north side and south side of Silverwood Lane. The area to the south of Silverwood Lane did not show any evidence of major impacts and five borrow pit features were recorded. The land to the north showed evidence of having undergone impacts from past farming activities, including earthmoving works for creation of a rubbish dump and an area of raised land along Silverwood Lane. Two borrow pits were able to be identified, but one had been used for dumping rubbish and the other was partially destroyed by previous earthworks along the border of Silverwood Lane. Again, Lidar data has indicated the presence of a larger number of features and it is considered likely that after topsoil stripping evidence of additional borrow pits may be present. Photographs are shown in Figure 20 and Figure 21.

S15/638 and S15/521

These sites were also identified from a review of aerial photographs, with S15/638 described as containing a single borrow pit and S15/521 containing five borrow pits on the NZAA site record. Again, Lidar data shows the presence of more features and a 2012 survey found evidence of five borrow pits in the general area (as can be seen in Figure 12). The area was briefly visited during the field survey to make note of its current status. The areas containing the borrow pits in 2012 were still open fields with no further development. A photograph is provided in Figure 22.

S15/23

This site was visited and recorded in 1973; however subsequent construction of a house and associated landscaping has severely damaged most of the site. A survey in 2012 noted that evidence of the ditch was still present. The area was visited during the survey and had been used for growing crops recently. Surface evidence of the ditch could not be seen, but it is considered likely that subsurface evidence at lower levels is still present.



Figure 19. Photograph of a borrow pit in the southern part of Growth Cell C4, previously recorded as S15/701, looking southwest



Figure 20. Photograph of a borrow pit on the southern side of Silverwood Lane, previously recorded as S15/637, looking northeast



Figure 21. Photograph of a borrow pit on the northern side of Silverwood Lane that has been damaged through rubbish dumping, previously recorded as S15/637, looking northwest



Figure 22. Photograph of a borrow pit in the northern part of the growth cell previously recorded as S15/521, looking south

Table 3. Coordinates taken for borrow pits that were identified during the field survey

NZAA #	Description	NZTM Easting	NZTM Northing
S15/637	Borrow pit c.10 x 15m and 1.5m deep. In paddock, no obvious impacts.	1815756	5801639
	Borrow pit c.10 x 15m and 1.5m deep. In paddock, no obvious impacts.	1815735	5801666
	Borrow pit c.15 x 20m and 2m deep. In paddock, no obvious impacts.	1815627	5801693
	Borrow pit c.20 x 30m and 2m deep. In paddock, no obvious impacts.	1815570	5801670
	Borrow pit c.10 x 5m and 0.5 m deep. In paddock, no obvious impacts.	1815592	5801670
	Borrow pit has been used to dump rubbish and ground has been disturbed. Original area and depth indeterminate.	1815667	5801731
	Borrow pit measuring c.5 x 10m and 0.5 m located along fence line and area has been impacted by bulldozer activity.	1815660	5801741
S15/701	Borrow pit c.20 x 10m and 1.5m deep. In paddock, no obvious impacts.	1816148	5801246
	Borrow pit c.10 x 15m and 2 m deep. In paddock, no obvious impacts.	1816170	5801208
	Borrow pit c.10 x 15 m and 0.5m deep. In paddock, no obvious impacts.	1816197	5801163

NZAA #	Description	NZTM Easting	NZTM Northing
	Borrow pit c.25 x 15m and 1.5m deep. Has been used by horses and base compacted affecting drainage, with water present.	1816217	5801172
	Borrow pit c.8 x 10m and 0.5m deep. In paddock, no obvious impacts.	1816280	5801168
	Borrow pit c.15 x 20m and 1.5m deep. In paddock, no obvious impacts.	1816280	5801112
	Borrow pit c.6 x 10m and 0.5m deep. In paddock, no obvious impacts.	1816308	5801106
	Borrow c.8 x 10m and 0.5m deep. In paddock, no obvious impacts.	1816368	5801076
	Borrow pit c.30 x 15m and 1m deep. In paddock, no obvious impacts.	1816316	5801091
	Borrow pit measuring c.8 x 10m and 0.5m deep. In paddock, no obvious impacts.	1816394	5801087
	Borrow pit c.8 x 18m and 0.2m deep. In paddock, looks to have been partially infilled.	1816387	5801063
	Borrow pit measuring c.30 x 20m and 1.5m deep. In paddock, no obvious impacts.	1816367	5801051
	Borrow pit c.30 x 20m and 1.5m deep. In paddock, no obvious impacts.	1816355	5801035
	Borrow pit c.15 x 20m and 0.5 m deep. In paddock, no obvious impacts	1816330	5800980
	Borrow pit c.10 x 20m and 1.5m deep. In paddock, no obvious impacts.	1816317	5800942
	Borrow pit c.15 x 15m and 2.5m deep. In paddock, no obvious impacts.	1816309	5800976
	Borrow pit c.10 x 15m and 2.5m deep. In paddock, no obvious impacts.	1816306	5801024
	Borrow pit c.15 x 20m and 0.5m deep. In paddock, no obvious impacts.	1816317	5800942
	Borrow pit c.10 x 10m and 0.5m deep. In paddock, no obvious impacts.	1816238	5801025
S15/702	Borrow pit c.30 x 20m and 2.5m deep. In paddock no obvious impacts.	1815952	5801221
	Borrow pit c.20 x 10m and 2m deep. Located alongside Cambridge Road and has been partially damaged from the road construction.	1815910	5801226
	Borrow pit c.15 x 25m and 1.5m deep. In paddock, no obvious impacts.	1815966	5801217
	Borrow pit c. 20 x 10m and 1m deep. In paddock, no obvious impacts.	1815997	5801225
	Borrow pit c.8 x 10m and 0.5 m deep. In paddock, no obvious impacts.	1816020	5801236
	Borrow pit measuring c.10 x 10m and 0.5m deep. In overgrown paddock near house, landscaping has taken place in general area.	1815874	5801398

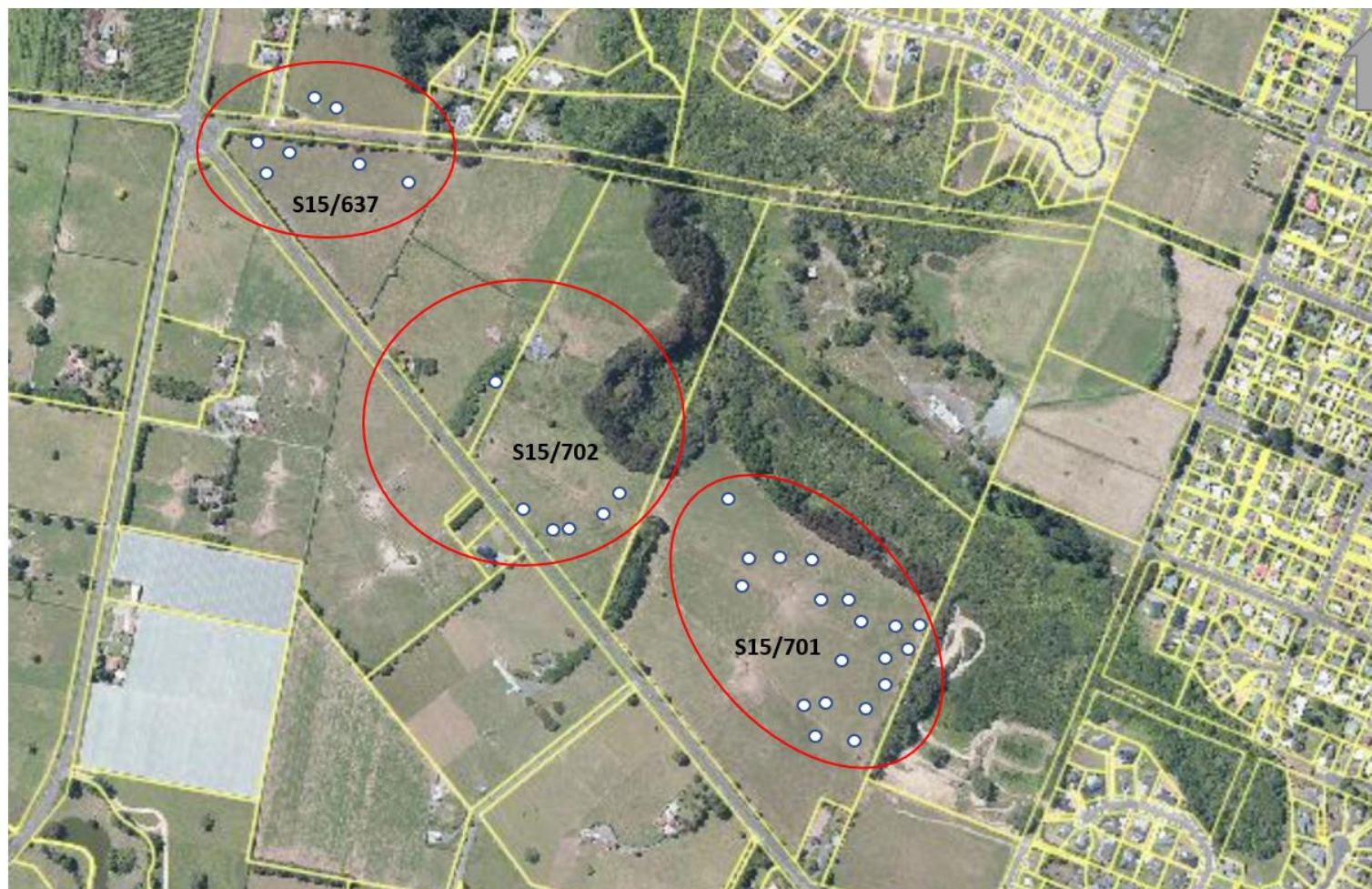


Figure 23. Aerial plan showing the locations of borrow pits identified during the field survey at S15/701, S15/702 and S15/637 (source: Waipa District Council Intramaps)

DISCUSSION AND CONCLUSIONS

Summary of Results

Six archaeological sites have been previously recorded in Growth Cell C4: S15/23, a pa site, and five borrow pit sites some with associated modified gardening soils (S15/521, S15/637, S15/638, S15/701 and S15/702). A desk-based review and a survey were undertaken as part of this preliminary assessment to gather background information and to make note of the current status and condition of the sites. The review and survey had the following results:

- Pa site S15/23 has been damaged and partially destroyed through house construction
- Sites S15/521 and S15/638, which are located to the west of the pa site, have been impacted through agricultural activities with five borrow pits and modified gardening soils identified in past surveys
- Site S15/637, originally recorded as a single borrow pit, was found to contain seven borrow pits during the survey for this assessment.
- The remaining two sites, S15/701 and S15/702, were originally recorded as containing 30 borrow pits each (from inspection of aerial photographs). During the survey a total of 25 borrow pits were able to be identified at the locations of these two sites, although it is considered likely that additional borrow pits are present and would be revealed after top-soil stripping, as surface evidence has been obscured in some cases through past agricultural activities. The condition of the inspected features ranged from poor to good, with the best preservation being in the southernmost part of the growth cell, i.e. around S15/701.

Maori Cultural Values

This is an assessment of archaeological values and does not include an assessment of Maori cultural values. Such assessments should only be made by the tangata whenua. Maori cultural concerns may encompass a wider range of values than those associated with archaeological sites.

Survey Limitations

It should be noted that archaeological survey techniques (based on visual inspection and minor sub-surface testing) cannot necessarily identify all sub-surface archaeological features, or detect wahi tapu and other sites of traditional significance to Maori, especially where these have no physical remains. All of the properties to the south of Silverwood Lane were accessible. To the north of Silverwood Lane, some of the residential properties were not accessible at the time of the survey, these included: Lots 1 & 2 DP 356214, Lot 1 DP 371625, Lots 1 & 2 DP 90107, Lots 4 & 5 DPS 66175, Lots 1 & 2 DPS 81358, Lot 1 DP 309649 and Lots 1, 2 & 3 DPS 78270.

Archaeological Value and Significance

The Waikato Regional Policy Statement (RPS) identifies several criteria for evaluating the significance of historic heritage places. In addition, Heritage NZ, has provided guidelines

setting out criteria that are specific to archaeological sites (condition, rarity, contextual value, information potential, amenity value and cultural associations) (Heritage NZ 2006: 9-10). Both sets of criteria have been used to assess the value and significance of archaeological sites S15/521, S15/701, S15/702, S15/637 and S15/638, which have been evaluated collectively in Table 4 and Table 5 as they are all borrow pit sites. S15/23, the pa site has been evaluated separately, with results in Table 6 and Table 7.

The archaeological value of sites relates mainly to their information potential, that is, the extent to which they can provide evidence relating to local, regional and national history using archaeological investigation techniques, and the research questions to which the site could contribute. The surviving extent, complexity and condition of sites are the main factors in their ability to provide information through archaeological investigation. For example, generally pa are more complex sites and have higher information potential than small midden (unless of early date). Archaeological value also includes contextual (heritage landscape) value. Archaeological sites may also have other historic heritage values including historical, architectural, technological, cultural, aesthetic, scientific, social, spiritual, traditional and amenity values.

Overall, the borrow pit sites are considered to have limited archaeological value based on the criteria discussed. This relates mainly to the nature of the sites, which are not complex sites and are very common in the area. As well, borrow pits have been extensively studied in previous archaeological investigations and it is not considered likely that the borrow pit sites would contribute any significant new information to the understanding of Maori horticultural practices. However, borrow pits at other archaeological sites in the area have been found to contain material suitable for carbon dating. If such material is present in the borrow pits or associated features, the archaeological value of the sites in Growth Cell C4 would be increased based on their information potential regarding dates of usage, which could provide information on how Maori settlement patterns developed over time in the Waikato, a subject which is not clearly understood at present. The occurrence of gardening soils represents another element in the archaeological landscape, but does not add significantly to the archaeological value of the sites, as gardening soils are commonly associated with borrow pits and their usage is well understood. Overall, the pa site is considered to have limited to moderate value, the latter based on the site type and the former on the fact that much of the site has been damaged or destroyed.

Table 4. Assessment of the archaeological values of sites S15/521, S15/637, S15/638, S15/701 and S15/702 (borrow pits) based on Heritage NZ criteria (Heritage NZ 2006: 9-10)

Value	Assessment
Condition	The landscape in Growth Cell C4 has undergone varying degrees of modification through historic farming practices and residential development. The best-preserved features are in the southern part of the growth cell. It is also noted that some of the borrow pit features, especially in the north, have been damaged. However, it is considered likely that even where development has damaged the upper layers, deeper archaeology and features may have survived.
Rarity	The sites are not rare as borrow pits are a very common site type in the area.
Contextual value	The borrow pits and gardening soils are associated with an archaeological landscape of Maori settlement and horticulture in the local and regional area.
Information potential	The formation and usage of borrow pits is well understood and it is not considered likely that the archaeological sites would contribute any new or significant

Value	Assessment
	information to the site type. It is, however, noted that dates of early settlement and occupation patterns in the Waikato are not well understood and the archaeological sites have the potential to contain material suitable for radiocarbon dating, which could add to the understanding of these processes.
Amenity value	The borrow pits are situated on private land and have little amenity value, although some can be seen from nearby public roads.
Cultural associations	The sites have Maori cultural association. The cultural significance of the sites is for tangata whenua to determine.
Other	No other values have been identified.

Table 5. Assessment of the heritage significance of sites S15/521, S15/637, S15/638, S15/701 and S15/702 (borrow pits) based on the Waikato Regional Policy Statement (Section 10A Table 10.1)

Archaeological Qualities	
Information	The sites have limited potential to provide new information on horticultural activities in the area and the creation and use of borrow pits is well understood
Research	The sites have limited to moderate potential to provide dating information that could add to the understanding of Maori settlement over time in the local area and along the Waikato River.
Recognition or Protection	The sites are recorded in the NZAA Site Recording Scheme and as pre-1900 archaeological sites are protected under the provisions of the HNZPT Act 2014.
Architectural Qualities	
Not applicable to these sites.	
Cultural Qualities	
Sentiment	The sites are not currently important as a focus of spiritual, political, national or other cultural sentiment. Their Maori cultural value should be determined by tangata whenua.
Identity	The sites are not currently a context for community identity or sense of place and do not provide evidence of cultural or historical continuity.
Amenity or Education	Limited, as the sites are situated on private land, although some can be seen from nearby public roads.
Historic Qualities	
Associative Value	The sites do not have any known direct association with, or relationship to, a person, group, institution, event or activity that is of historical significance to Waikato or the nation.
Historical Pattern	If appropriate material is present for dating purposes it could be used to provide information on temporal patterns of Maori settlement in the local area.
Scientific Qualities	
Information	The sites do not have any particular potential to contribute information about an historic figure, event, phase or activity.
Potential Scientific Research	The research potential of the sites is of an archaeological nature and is addressed under the first heading.
Technological Qualities	
Technical Achievement	The creation of manmade gardening soils was an innovative adaptation to a new environment and the borrow pits as part of this process have some limited technical value.

Table 6. Assessment of the heritage significance of site S15/23 (pa) based on the Waikato Regional Policy Statement (Section 10A Table 10.1)

Archaeological Qualities	
Information	The site is partially destroyed and its potential to contain any archaeological deposits or features that would make a significant contribution to the existing knowledge of Maori settlement in the area is likely to be limited.
Research	If the site does contain any intact features, including material that could be used for radiocarbon dating, this could be used to provide information on patterns of past Maori settlement in the area.
Recognition or Protection	The site is recorded in the NZAA Site Recording Scheme and is a protected archaeological site as defined in the HNZPT Act 2014.
Architectural Qualities	
Not applicable to these sites.	
Cultural Qualities	
Sentiment	The site is not currently important as a focus of spiritual, political, national or other cultural sentiment. Their Maori cultural value should be determined by tangata whenua.
Identity	The site is not currently a context for community identity or sense of place and do not provide evidence of cultural or historical continuity.
Amenity or Education	Limited, as the site is situated on private land and any evidence of the site is only visible from close up.
Historic Qualities	
Associative Value	The site does not have any known direct association with, or relationship to, a person, group, institution, event or activity that is of historical significance to Waikato or the nation.
Historical Pattern	If appropriate material is present for dating purposes it could be used to provide information on temporal patterns of Maori settlement in the local area.
Scientific Qualities	
Information	The site does not have any particular potential to contribute information about an historic figure, event, phase or activity.
Potential Scientific Research	The research potential of the site is of an archaeological nature and is addressed under the first heading.
Technological Qualities	
Technical Achievement	There is no evidence that the site shows a high degree of creative or technical achievement or is associated with scientific or technical innovations or achievements.

Table 7. Assessment of the archaeological values of site S15/23 based on Heritage NZ criteria (Heritage NZ 2006: 9-10)

Value	Assessment
Condition	The site has been damaged by house construction and associated landscaping and is considered mostly destroyed, although a ditch may survive.
Rarity	There are a number of pa sites in the area. It is not a rare site type.
Contextual value	The site should not be considered in isolation, as it is part of a wider archaeological landscape of sites associated with settlement around the Waikato River, a highly desirable area for Maori settlement in the past. Its contextual value lies in its contribution to the wider archaeological landscape of the area.
Information potential	This depends on both the ability of a site to provide information relating to the history of New Zealand through archaeological investigation, and on the research questions to which it could contribute. This site has suffered considerable damage from farming activities and has been partially destroyed and the information to be gained from scientific investigation will be limited by the loss of features and elements of the site. It should be noted, however, that any intact features that have survived would contribute to knowledge of Maori settlement of the area.
Amenity value	The site is on private land and currently has limited amenity value.
Cultural associations	The site has Maori cultural association. Its cultural significance is for tangata whenua to determine.
Other	No other values were identified.

Potential Effects of Future Development

Six archaeological sites are located within the boundary of Growth Cell C4 and may be affected by future development. These are S15/23, a partially destroyed pa site, and five borrow pit sites (S15/521, S15/637, S15/638, S15/70 and S15/702) with associated modified gardening soils also present. As Growth Cell C4 is proposed for residential development, it is not considered practical to avoid all impacts on the recorded archaeological sites, which are spread over a relatively large area. However, as the project is at the planning stage, consideration could be given to partial avoidance of some of the borrow pit features, which could be retained and protected in reserve areas within the future development layout, with appropriate interpretation. As the five borrow pit sites are considered to have limited archaeological value, the potential effects on the sites (or parts of sites) if they cannot be avoided during future development is considered to be minor and can be mitigated through recording of both above ground and any sub-surface remains and through collection of information (particularly through collection of material suitable for radiocarbon dating) under the provisions of the HNZPTA.

The pa site S15/23 has been seriously impacted through house construction and associated landscaping and as such the site is considered to have limited archaeological value. However, avoidance of the site should be considered in future development plans, which would allow for the preservation of any remaining features.

Based on historical research it is also considered likely that additional unrecorded subsurface archaeological sites are located within Growth Cell C4 and will be exposed during future development. The remains are expected to be associated firstly, with Maori settlement and horticulture, but possibly with early European settlement as an old dray track was identified on an 1860s plan (see Figure 24). Any unrecorded archaeological sites are not expected to be complex in nature and for sites associated with Maori settlement and horticulture they are likely to consist of additional borrow pits, modified gardening soils, midden and oven remains. As the currently recorded archaeological sites are spread throughout the growth cell, the potential for additional archaeological remains to be present is not confined to any particular area. If any sites associated with early European settlement are present, the remains would likely be associated with past agricultural use or domestic remains, such as a well and rubbish pits may also be present in the southeast corner of the growth cell, where a 1905 plan shows presence of a small subdivided lot and a 1943 aerial photograph shows the presence of buildings (location shown in Figure 24).

As this is a preliminary assessment, once layout and design have been prepared it will be necessary to determine the specific level of effects to both archaeological sites and the broader archaeological landscape and to recommend appropriate mitigation measures.



Figure 24. Aerial plan of the southern part of Growth Cell C4 showing the potential areas for containing evidence of early European settlement (source: Waipa District Intramaps)

Resource Management Act 1991 Requirements

Section 6 of the RMA recognises as matters of national importance: ‘the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga’ (S6(e)); and ‘the protection of historic heritage from inappropriate subdivision, use, and development’ (S6(f)).

All persons exercising functions and powers under the RMA are required under Section 6 to recognise and provide for these matters of national importance when ‘managing the use, development and protection of natural and physical resources’. There is a duty to avoid, remedy, or mitigate any adverse effects on the environment arising from an activity (S17), including historic heritage.

Historic heritage is defined (S2) as ‘those natural and physical resources that contribute to an understanding and appreciation of New Zealand’s history and cultures, deriving from any of the following qualities: (i) archaeological; (ii) architectural; (iii) cultural; (iv) historic; (v) scientific; (vi) technological’. Historic heritage includes: ‘(i) historic sites, structures, places, and areas; (ii) archaeological sites; (iii) sites of significance to Maori, including wahi tapu; (iv) surroundings associated with the natural and physical resources’.

Regional, district and local plans contain sections that help to identify, protect and manage archaeological and other heritage sites. The plans are prepared under the provisions of the RMA. The Waipa District Plan is relevant to the proposed activity.

This assessment has established that future development in Growth Cell C4 has the potential to affect six previously recorded archaeological sites (S15/23, S15/521, S15/637, S15/638, S15/701 and S15/702). There is also potential for additional unrecorded archaeological remains to be present within Growth Cell C4.

An evaluation of archaeological values of the recorded archaeological sites has been prepared and levels of effects have been predicted based on planned future development, which is proposed to be residential. Only one of the sites, S15/23 is listed in Appendix N3 on the Waipa District Plan. It should be noted however, that all archaeological sites are protected under the provisions of the Heritage New Zealand Pouhere Taonga Act (see below). Preliminary mitigation measures for the recorded sites are included in this report, but further assessment and detailed mitigation recommendations will be required once future development plans have been prepared.

Heritage New Zealand Pouhere Taonga Act 2014 Requirements

In addition to any requirements under the RMA, the HNZPTA protects all archaeological sites whether recorded or not, and they may not be damaged or destroyed unless an Authority to modify an archaeological site has been issued by Heritage NZ (Section 42).

An archaeological site is defined by the HNZPTA Section 6 as follows:

‘archaeological site means, subject to section 42(3)², –

(a) any place in New Zealand, including any building or structure (or part of a building or structure) that –

² Under Section 42(3) an Authority is not required to permit work on a pre-1900 building unless the building is to be demolished.

- (i) was associated with human activity that occurred before 1900 or is the site of the wreck of any vessel where the wreck occurred before 1900; and
- (ii) provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand; and
- (b) includes a site for which a declaration is made under section 43(1)³,

Authorities to modify archaeological sites can be applied for either in respect to archaeological sites within a specified area of land (Section 44(a)), or to modify a specific archaeological site where the effects will be no more than minor (Section 44(b)), or for the purpose of conducting a scientific investigation (Section 44(c)). Applications that relate to sites of Maori interest require consultation with (and in the case of scientific investigations the consent of) the appropriate iwi or hapu and are subject to the recommendations of the Maori Heritage Council of Heritage NZ. In addition, an application may be made to carry out an exploratory investigation of any site or locality under Section 56, to confirm the presence, extent and nature of a site or suspected site.

At present six archaeological sites have been identified in Growth Cell C4. Based on the findings of the background research and survey it is considered likely that other unrecorded sub-surface archaeological remains related to Maori settlement and horticulture and also possibly to early European Settlement may be present.

If modification of a pre-1900 archaeological site/s is necessary for future development, an Authority issued under the HNZPTA would be required prior to the commencement of site works. This would also apply to unrecorded archaeological sites in the growth cell.

Conclusions

This assessment has identified existing and potential heritage constraints in Growth Cell C4 in the form of six recorded archaeological sites and the potential for unrecorded archaeological sites to be present. The recorded sites consist of a pa site (S15/23) that has been modified by house construction and five borrow pit sites (S15/521, S15/637, S15/638, S15/701 and S15/702) extending over much of the growth cell. Although the full effects on archaeological values are not yet known, it is recommended that future development plans should take account recorded archaeological sites and avoid them fully or partially where possible. If avoidance is not possible, an authority issued by Heritage NZ would be required before any modification or destruction of the recorded sites (as well as any unrecorded archaeological sites) occurs as a result of future development. Mitigation measures would also be required for any impacts on recorded and unrecorded archaeological sites, which would generally be in the form of archaeological recording and investigation to recover information relating to the history of the area.

³ Under Section 43(1) a place post-dating 1900 (including the site of a wreck that occurred after 1900) that could provide ‘significant evidence relating to the historical and cultural heritage of New Zealand’ can be declared by Heritage NZ to be an archaeological site.

RECOMMENDATIONS

- Future development plans should take account of the locations of the recorded archaeological sites and ensure that they are avoided to the extent possible.
- Further assessment will be required once plans for the future development have been prepared and this report should be updated accordingly.
- If any of the recorded sites cannot be avoided, an Authority must be applied for under Section 44(a) of the HNZPTA and granted by Heritage NZ prior to the start of any works that will affect them. (*Note that this is a legal requirement*).
- The tangata whenua should be consulted regarding the potential cultural effects of future development as part of the Structure Plan process.

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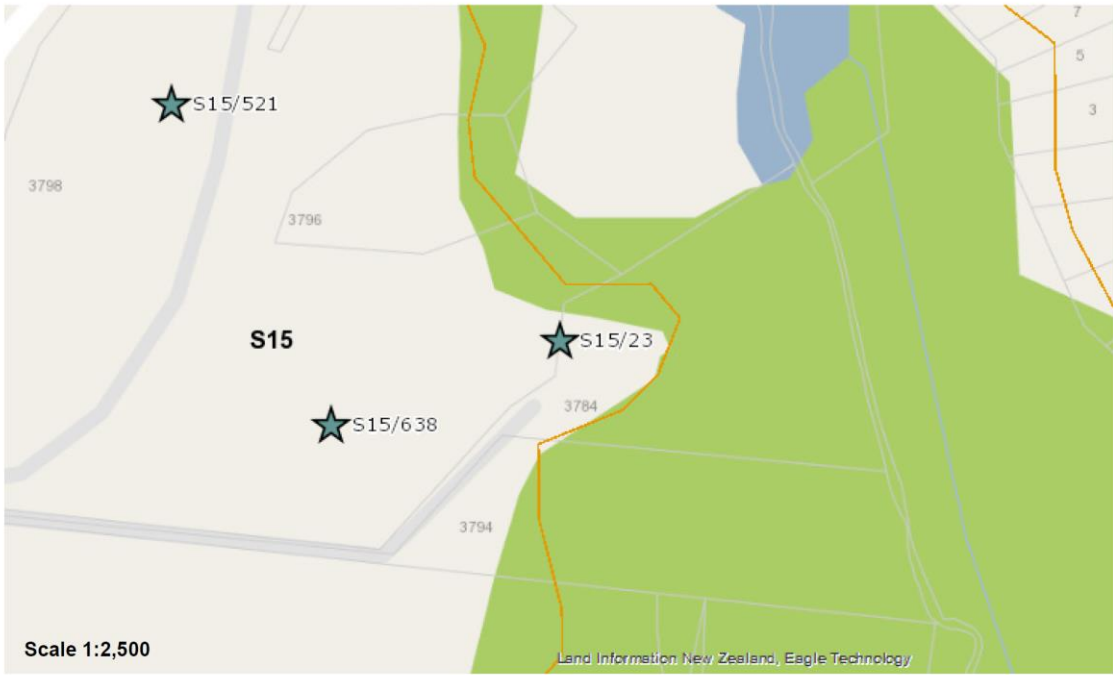
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APPENDIX A: SITE RECORD FORMS

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/23</p> <p>SITE TYPE: Pa</p> <p>SITE NAME(s):</p> <p>DATE RECORDED:</p>
<p>SITE COORDINATES (NZTM) Easting: 1815831 Northing: 5802104 Source: On Screen</p>	
<p>IMPERIAL SITE NUMBER: N65/43 METRIC SITE NUMBER: S15/23</p>	
 <p>Scale 1:2,500</p> <p>Land Information New Zealand, Eagle Technology</p>	
<p>Finding aids to the location of the site</p> <p>Leamington. 300m SE of a sharp bend in Cambridge Road, on edge of stream gully.</p>	
<p>Brief description</p> <p>Roughly rectangular pa 50 x 50m, with single transverse ditch, lateral pits and terraces.</p>	
<p>Recorded features</p> <p>Ditch - transverse, Pit, Terrace</p>	
<p>Other sites associated with this site</p>	

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: S15/23
<p>Site description</p> <p>Updated: 18/07/2012 - NZTM E1815831 / N5802104 (On Screen). Location visible on Waikato Regional Council (Environment Waikato) Aerial Photographs 2002. House built on site ca. 1980. Intensive cultivation adjoining. Ditch may survive. Updated by: Coster, John (NZAA Upgrade Project, 2008-2009).</p> <p>Condition of the site</p> <p>Statement of condition</p> <p>Current land use:</p> <p>Threats:</p>	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY	NZAA SITE NUMBER: S15/23
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Supporting documentation held in ArchSite

AD BC AE BD AA TT

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM		SITE NUMBER N65/43
Map number N65	Map name Hamilton	SITE NAME: MAORI OTHER
Map edition 3rd	Grid Reference 956 330	SITE TYPE Pa
1. Aids to relocation of site E2 95600 N533000 Top of hill one mile east of Leamington - 200 yards to left of road overlooking steep gully		
2. State of site; possibility of damage or destruction Ploughed out single unit site in grass		
3. Description of site (NOTE: This section is to be completed ONLY if no separate Site Description Form is to be prepared.) Square site approximately 45m x 45m. East and south sides fairly steep with small spur and possible house sites out from SE corner. North side steepish with some house terraces. West side ditch and bank pretty well filled in		
4. Owner Address	A Higgins Cambridge	Tenant/Manager Address
Attitude		Attitude
5. Methods and equipment used visit site with compass and tape Photographs taken: 4/68 No (Describe on Photograph Record Form) Date recorded 30 September 1973		
6. Aerial photograph or mosaic No. 2173/34 x 35		Site shows: Clearly/badly/not at all
7. Reported by Address	NC Laurie RD 9 Frankton	Filekeeper J.P. Egan per K. Soreby
Date	1 May 1974	Date 28/10/76.

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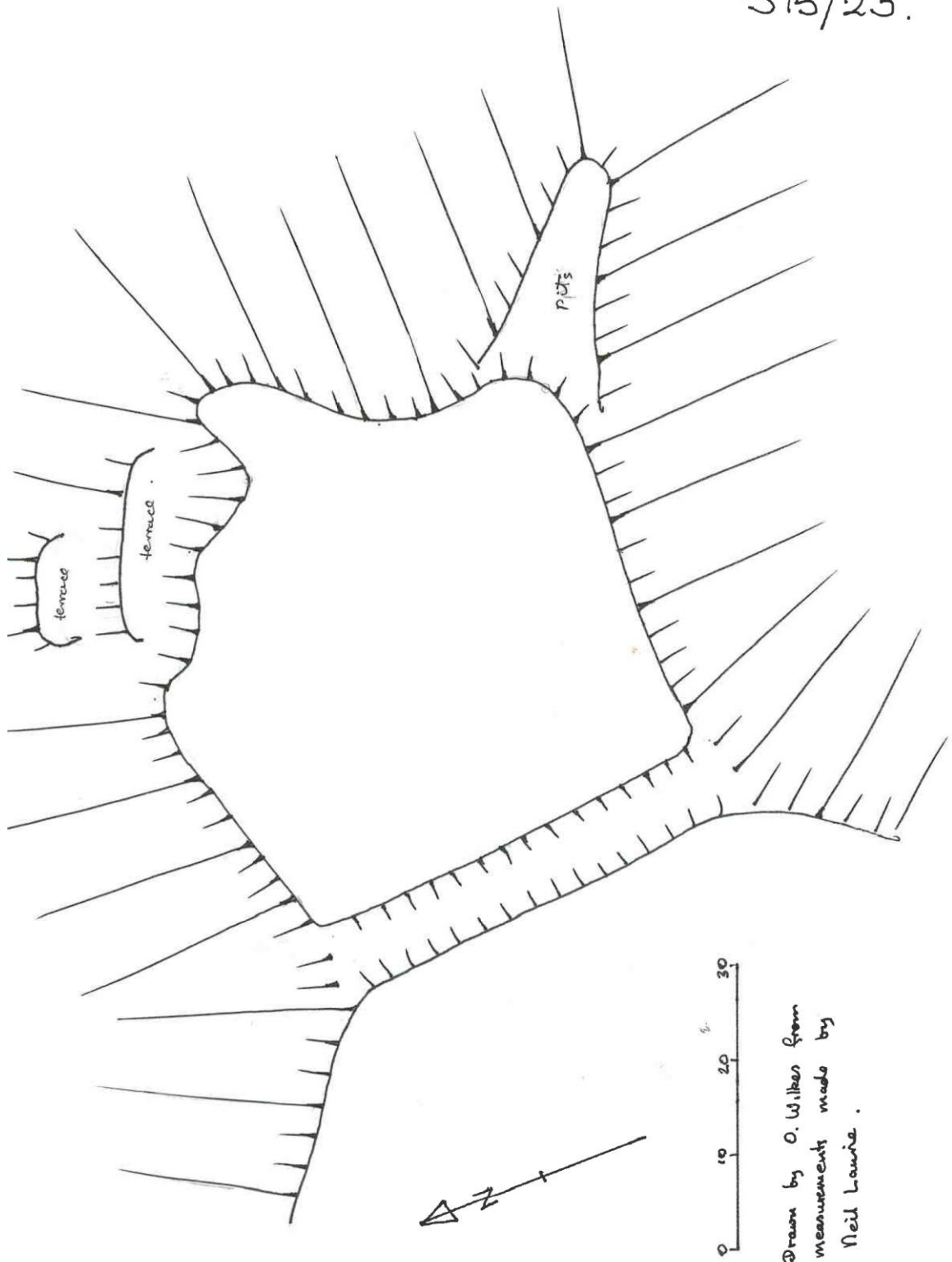
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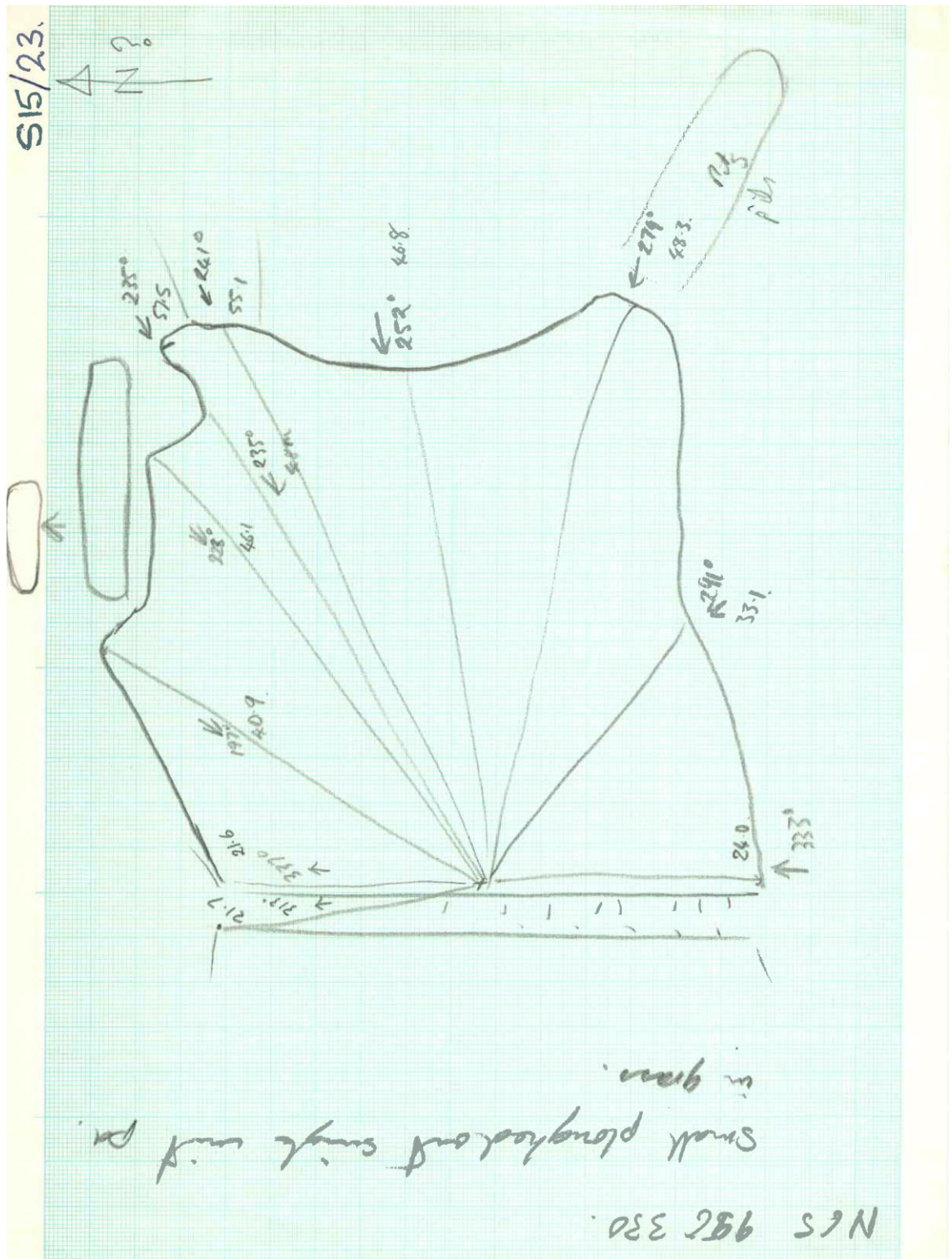
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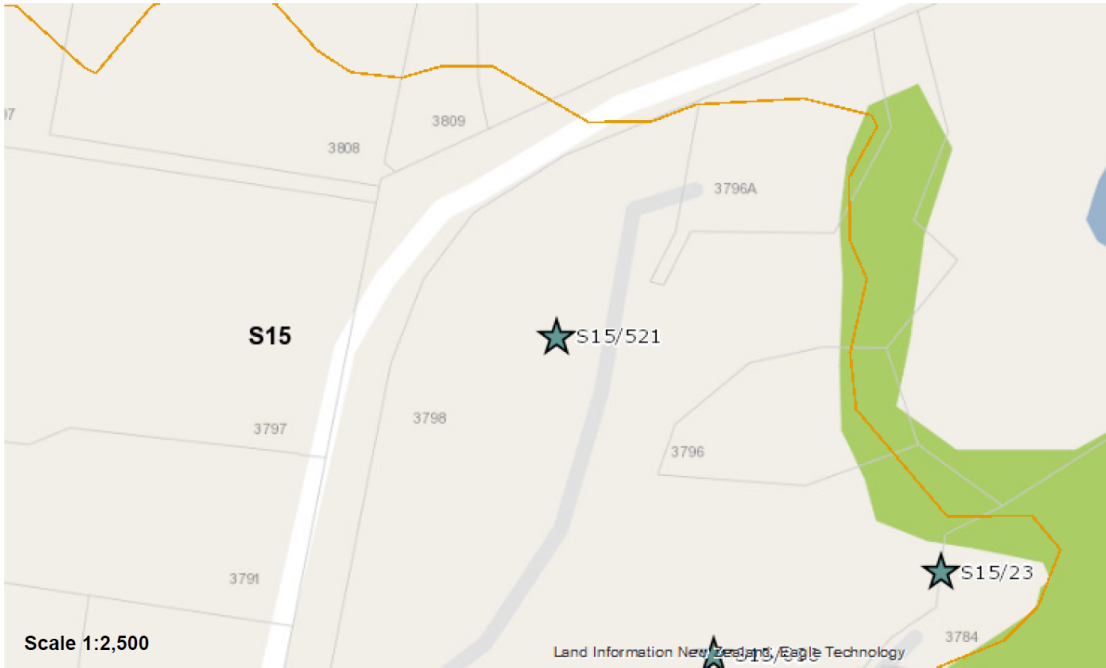
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S15/23.





NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>ARCH SITE archaeological site recording scheme</p> <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/521</p> <p>SITE TYPE: Maori horticulture</p> <p>SITE NAME(s):</p> <p>DATE RECORDED: 23/03/2012</p>
<p>SITE COORDINATES (NZTM) Easting: 1815661 Northing: 5802208 Source: On Screen</p>	
<p>IMPERIAL SITE NUMBER: METRIC SITE NUMBER:</p>	
 <p>Scale 1:2,500</p> <p>Land Information New Zealand, Eagle Technology</p>	
<p>Finding aids to the location of the site</p>	
<p>Brief description</p> <p>5 borrow pits in an area of 120 x 60 m, visible on aerial photo SN266/835/59.</p>	
<p>Recorded features</p> <p>Borrow pit</p>	
<p>Other sites associated with this site</p>	

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: S15/521
<p>Site description</p> <p>Updated: 23/03/2012 - NZTM E1815661 / N5802208 (On Screen). 5 borrow pits in an area of 120 x 60 m, visible on aerial photo SN266/835/59. Aerial photo dates from 1943. The site has not been visited and its current condition has not been ascertained. Updated by: Campbell, Matthew.</p> <p>Condition of the site</p> <p>Statement of condition</p> <p>Current land use:</p> <p>Threats:</p>	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY	NZAA SITE NUMBER: S15/521
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Supporting documentation held in ArchSite

Site record update: S15/521 and S15/638

14 May 2014

Site survey was carried out on 10 May 2014 by Warren Gumbley and Malcolm Hutchinson.

As well as identification of the remaining surface visible borrow pits, a survey of the soil using a 25 mm screw-type soil augur was undertaken to identify the presence of Maori modified soil (Tamahere loam).

The results indicate that S15/521 and S15/638 are aspects of the same pre-European Maori horticulture site. The immediate proximity of this horticultural site indicates an immediate association with the un-named paa S15/23.

Figure 1 is a 1943 aerial photograph showing the locations of the surface borrow pits and the soil examination locations. The yellow dots indicate the presence of Tamahere loam.

Figure 2 shows the same information overlaid on a 2012 aerial photograph.

Note: the gap in the survey in the area of the current house and curtilage in the middle of each image represents a now destroyed part of the horticulture site.

The site has been affected by rural residential subdivision, which has destroyed approximately 20-25 % of the site. The ditch of S15/23 remains while most of the rest of the paa has been badly damaged.

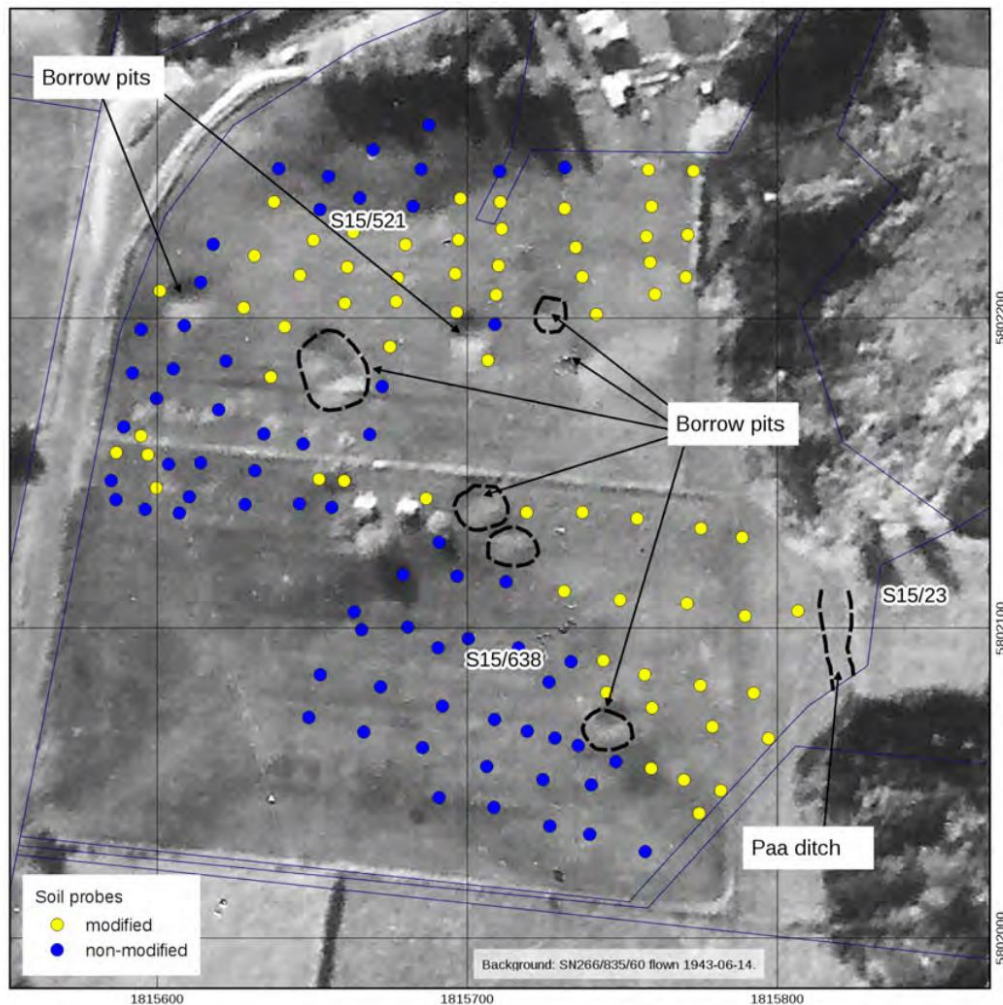


Figure 1: Aerial photograph SN 266/853/59 flown 13/9/1943. Black dashed outlines show the currently visible borrow pits. The yellow dots indicate the current extent of the Maori modified soils (Tamahere loam). Note grid-lines are at 100 m intervals; datum = NZGD 2000; projection NZTM.

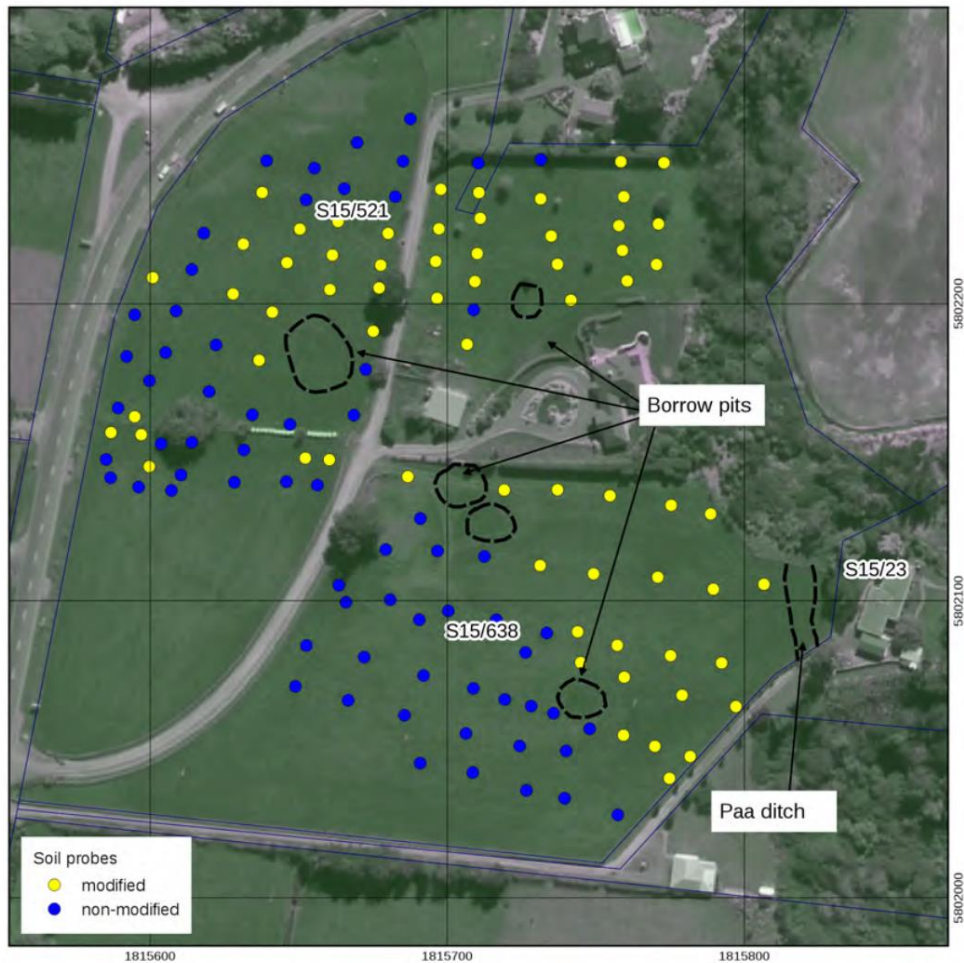

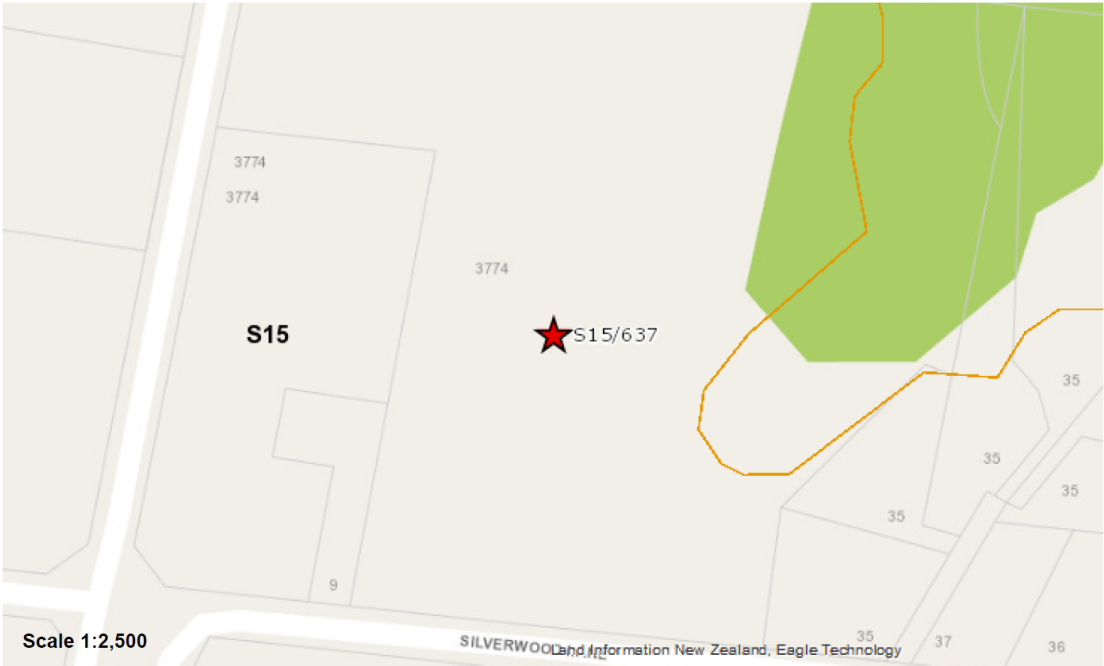


Figure 2: Site survey data overlaid on 2012 aerial photographs (WRAPS 2012 tile BD35_1005). Black dashed outlines show the currently visible borrow pits. The yellow dots indicate the current extent of the Maori modified soils (Tamahere loam). Note grid-lines are at 100 m intervals; datum = NZGD 2000; projection NZTM.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>ARCH SITE archaeological site recording scheme</p> <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/637</p> <p>SITE TYPE: Maori horticulture</p> <p>SITE NAME(s):</p> <p>DATE RECORDED: 26/04/2012</p>
<p>SITE COORDINATES (NZTM) Easting: 1815686 Northing: 5801845 Source: On Screen</p>	
<p>IMPERIAL SITE NUMBER: METRIC SITE NUMBER:</p>	
 <p>Scale 1:2,500</p> <p>Land Information New Zealand, Eagle Technology</p>	
<p>Finding aids to the location of the site</p> <p>The site is located on the northern and southern sides of Silverwood Lane. Location of originally identified borrow pit features now has a house on it.</p>	
<p>Brief description</p> <p>Single borrow pit visible on aerial photo SN266/835/59.</p>	
<p>Recorded features</p> <p>Borrow pit</p>	
<p>Other sites associated with this site</p>	

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: S15/637
<p>Site description</p> <p>Updated 18/08/2019 (Field visit), submitted by ellencameron , visited 25/07/2019 by Cameron, Ellen Grid reference (E1815686 / N5801845)</p> <p>A site visit identified two borrow pits to the north of Silverwood Lane and five borrow pits to the south. All of the pits are located in grassed paddocks. The site visit was for a preliminary assessment and it is considered likely that additional borrow pits may be present that cannot be identified from surface evidence.</p> <p>Borrow pits - Coordinates and description</p> <p>South of Silverwood Lane c. 10 x 15 m and 1.5m deep. In paddock no obvious impacts. 1815756 5801639 c. 10 x 15 m and 1.5m deep. In paddock no obvious impacts. 1815735 5801666 c. 15 x 20m and 2 m deep. In paddock no obvious impacts. 1815627 5801693 c. 20 x 30m and 2m deep. In paddock no obvious impacts. 1815570 5801670 c. 10 x 5m and .5 m deep. In paddock no obvious impacts. 1815592 5801670</p> <p>North of Silverwood Lane Has been used to dump rubbish and ground has been disturbed. Original area and depth indeterminate. 1815667 5801731 c. 5 x 10 m and .5 m located along fence line and area has been impacted by bulldozer activity. 1815660 5801741</p> <p>Updated: 26/04/2012 - NZTM E1815686 / N5801845 (On Screen). Single borrow pit visible on aerial photo SN266/835/59. Aerial photo dates from 1943. The site has not been visited and its current condition has not been ascertained. Updated by: Campbell, Matthew.</p> <p>Condition of the site</p> <p>Updated 18/08/2019 (Field visit), submitted by ellencameron , visited 25/07/2019 by Cameron, Ellen</p> <p>The site is located in paddocks and past agricultural activities have damaged the upper levels of the soil.</p> <p>Statement of condition</p> <p>Current land use:</p> <p>Threats:</p>	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY	NZAA SITE NUMBER: S15/637
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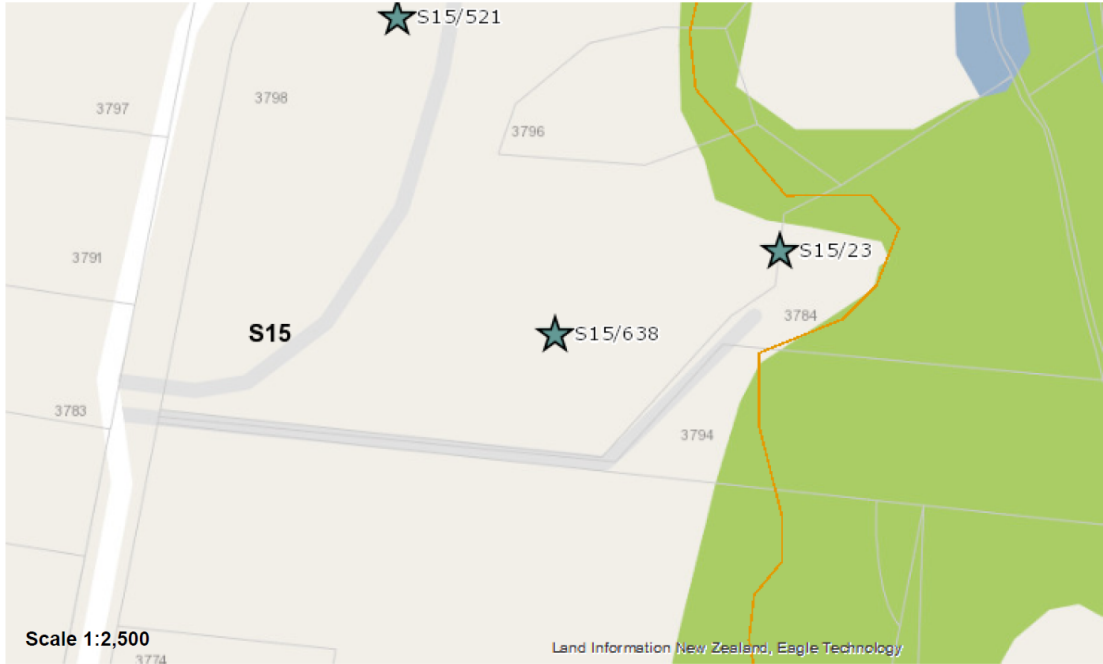
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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/638</p> <p>SITE TYPE: Maori horticulture</p> <p>SITE NAME(s):</p> <p>DATE RECORDED: 26/04/2012</p>
<p>SITE COORDINATES (NZTM) Easting: 1815731 Northing: 5802067 Source: On Screen</p>	
<p>IMPERIAL SITE NUMBER: METRIC SITE NUMBER:</p>	
 <p>Scale 1:2,500</p> <p>Land Information New Zealand, Eagle Technology</p>	
<p>Finding aids to the location of the site</p>	
<p>Brief description</p> <p>Single borrow pit visible on aerial photo SN266/835/59.</p>	
<p>Recorded features</p> <p>Borrow pit</p>	
<p>Other sites associated with this site</p>	

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: S15/638
<p>Site description</p> <p>Updated: 26/04/2012 - NZTM E1815731 / N5802067 (On Screen). Single borrow pit visible on aerial photo SN266/835/59. Aerial photo dates from 1943. The site has not been visited and its current condition has not been ascertained. Updated by: Campbell, Matthew.</p> <p>Condition of the site</p> <p>Statement of condition</p> <p>Current land use:</p> <p>Threats:</p>	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY	NZAA SITE NUMBER: S15/638
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Supporting documentation held in ArchSite

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Site record update: S15/521 and S15/638

14 May 2014

Site survey was carried out on 10 May 2014 by Warren Gumbley and Malcolm Hutchinson.

As well as identification of the remaining surface visible borrow pits, a survey of the soil using a 25 mm screw-type soil augur was undertaken to identify the presence of Maori modified soil (Tamahere loam).

The results indicate that S15/521 and S15/638 are aspects of the same pre-European Maori horticulture site. The immediate proximity of this horticultural site indicates an immediate association with the un-named paa S15/23.

Figure 1 is a 1943 aerial photograph showing the locations of the surface borrow pits and the soil examination locations. The yellow dots indicate the presence of Tamahere loam.

Figure 2 shows the same information overlaid on a 2012 aerial photograph.

Note: the gap in the survey in the area of the current house and curtilage in the middle of each image represents a now destroyed part of the horticulture site.

The site has been affected by rural residential subdivision, which has destroyed approximately 20-25 % of the site. The ditch of S15/23 remains while most of the rest of the paa has been badly damaged.

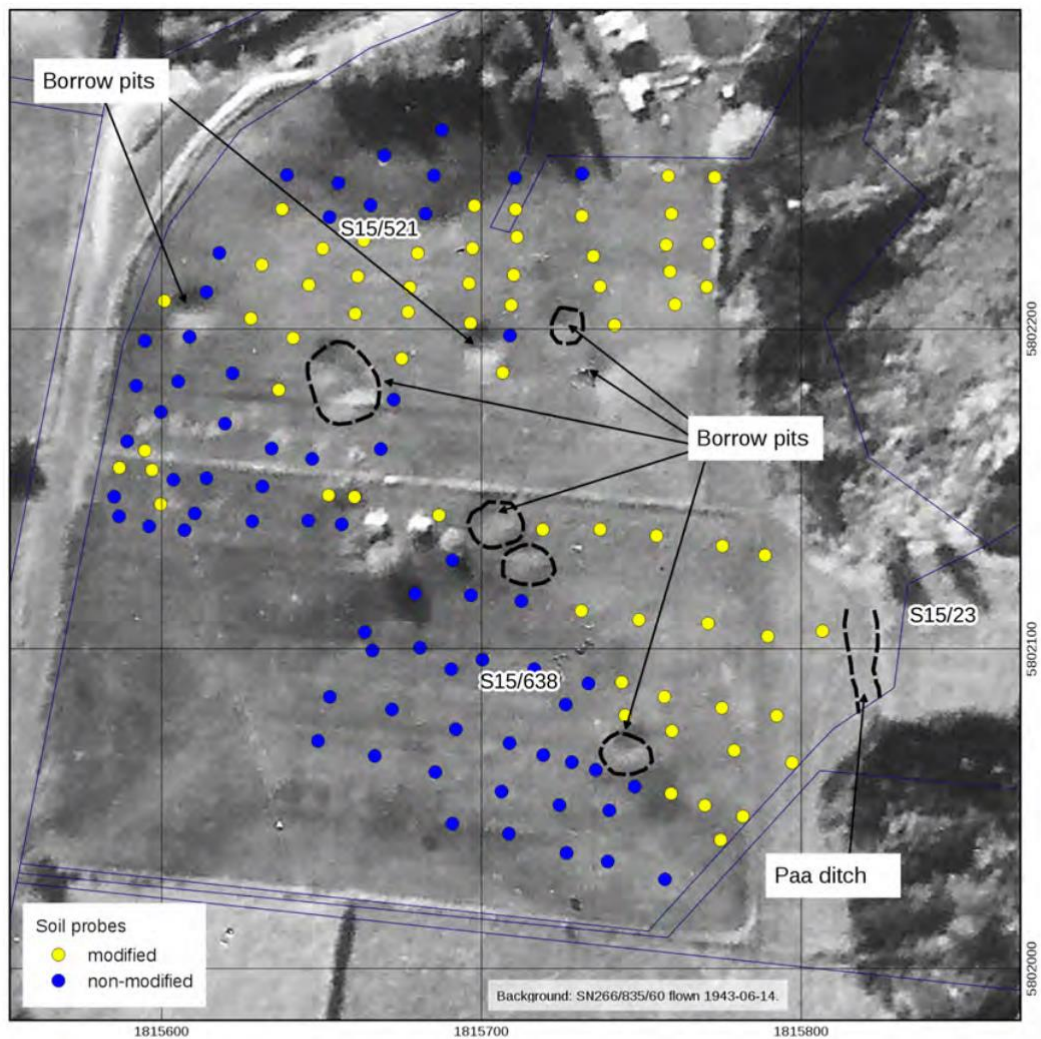


Figure 1: Aerial photograph SN 266/853/59 flown 13/9/1943. Black dashed outlines show the currently visible borrow pits. The yellow dots indicate the current extent of the Maori modified soils (Tamahere loam). Note grid-lines are at 100 m intervals; datum = NZGD 2000; projection NZTM.

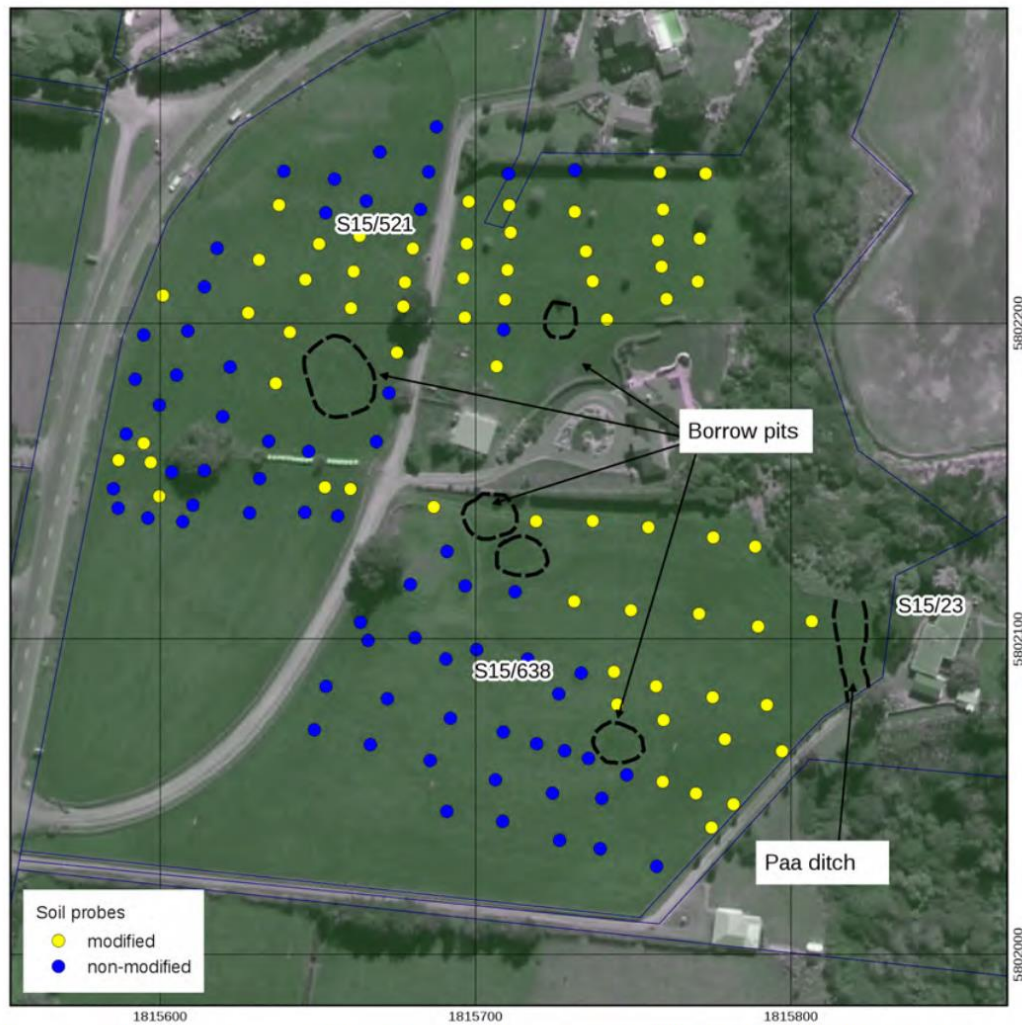




Figure 2: Site survey data overlaid on 2012 aerial photographs (WRAPS 2012 tile BD35_1005). Black dashed outlines show the currently visible borrow pits. The yellow dots indicate the current extent of the Maori modified soils (Tamahere loam). Note grid-lines are at 100 m intervals; datum = NZGD 2000; projection NZTM.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/701</p> <p>SITE TYPE: Maori horticulture</p> <p>SITE NAME(s):</p> <p>DATE RECORDED: 17/12/2013</p>
<p>SITE COORDINATES (NZTM) Easting: 1816264 Northing: 5801020 Source: On Screen</p>	
<p>IMPERIAL SITE NUMBER: METRIC SITE NUMBER:</p>	
 <p>Scale 1:2,500</p> <p>Land Information New Zealand, Eagle Technology</p>	
<p>Finding aids to the location of the site</p>	
<p>Brief description 30 borrow pits</p>	
<p>Recorded features Borrow pit, Unclassified</p>	
<p>Other sites associated with this site</p>	

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: S15/701
<p>Site description Updated: 17/12/2013 - to follow</p> <p>Condition of the site</p> <p>Statement of condition</p> <p>Current land use:</p> <p>Threats:</p>	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY

NZAA SITE NUMBER: S15/701



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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>ARCHSITE archaeological site recording scheme</p> <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/702</p> <p>SITE TYPE: Maori horticulture</p> <p>SITE NAME(s):</p> <p>DATE RECORDED: 17/12/2013</p>
<p>SITE COORDINATES (NZTM) Easting: 1815883 Northing: 5801460 Source: On Screen</p>	
<p>IMPERIAL SITE NUMBER: METRIC SITE NUMBER:</p>	
	
<p>Finding aids to the location of the site</p>	
<p>Brief description 30 borrow pits</p>	
<p>Recorded features Borrow pit, Unclassified</p>	
<p>Other sites associated with this site</p>	

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1 of 3

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: S15/702
<p>Site description Updated: 17/12/2013 - to follow</p> <p>Condition of the site</p> <p>Statement of condition</p> <p>Current land use:</p> <p>Threats:</p>	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY	NZAA SITE NUMBER: S15/702
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