

CAMBRIDGE, HAUTAPU, PROPOSED WASTEWATER TREATMENT FACILITY AND ASSOCIATED INFRASTRUCTURE: PRELIMINARY ARCHAEOLOGICAL ASSESSMENT

Prepared for Fonterra Cooperative Group Ltd

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INTRODUCTION

Project Background

Fonterra Cooperative Group Ltd proposes the construction of a wastewater treatment facility (WWTF), upgrading of the existing riverline pipeline and replacement of an existing diffuser structure in the Waikato River at Cambridge (Figure 1). The proposed layout plan for the WWTF, including calamity and balance tanks and pipeline connection to the existing wastewater storage facility, is shown in Figure 2; the location of the existing outfall to be upgraded and diffuser to be replaced in Figure 3; and the alignment of the existing riverline pipeline to be upgraded is shown in Figure 4. As can also be seen in Figure 4 there is a section of abandoned pipeline to the south of Cambridge Road- this section will not be affected by the proposed upgrade. The proposed upgrading works for the riverline pipeline and outfall pipeline will be in the form of a second pipe to be installed alongside the existing pipeline. The addresses and legal descriptions of the affected properties are included in Table 1 and detailed aerial plans are shown in Appendix B.

The development is to enable the implementation of the Hautapu manufacturing site's water and wastewater management strategy. The current wastewater management system relies heavily on the discharge to land, through irrigation onto surrounding farmland for the treatment of the wastewater and the uptake of nutrients by pasture growth. A limited volume of processing wastewater can be discharged to the Waikato River. The significant reliance on the land, including during times of wet weather, isn't sustainable and the proposed strategy has been to firstly reduce the volume of water required for dairy product manufacturing, and then integrated management between a highly treated wastewater discharge to land and/or to the River, with the latter predominantly being in the winter and early spring months. Changes to the regulatory environment, including the introduction of the National Policy for Freshwater Management 2014 (amended 2017), the settlement of the Waikato River claim with the Crown and the associated introduction of the Vision and Strategy for the Waikato River (via its incorporation into the Regional Policy Statement and Proposed Plan Change 1 to the Waikato Regional Plan) are all matters that have been considered in Hautapu's water and wastewater strategy. This strategy can only be realised by the investment in a wastewater treatment facility and a new pipeline to the Waikato River.

An archaeological assessment has been commissioned by Fonterra to establish whether the proposed work is likely to impact on archaeological values. This preliminary report has been prepared as part of the required assessment of effects accompanying a resource consent application under the Resource Management Act 1991 (RMA) and to identify any 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 and the Heritage New Zealand Pouhere Taonga (Heritage NZ) New Zealand Heritage List/Rārangī Kōrero were searched to determine whether any archaeological sites had been recorded on or in the immediate vicinity of the proposed WWTF. Literature and archaeological reports relevant to the area were consulted (see Bibliography). Early survey plans were checked for information relating to past land use

and archival research was carried out to establish the history of the properties containing the WWTF, Pipeline and Outfall.

Visual inspections of the proposed WWTF location and outfall/diffuser site were undertaken on 19 February 2021. 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. The existing alignment for the remaining sections of the riverline pipeline was not included in the survey as they were situated in cultivated/ formerly cultivated fields or in road reserves and no surface evidence of archaeological remains would be expected. Photographs were taken to record the topography and features of interest.

Table 1. Addresses and Legal Descriptions of the properties

Address	Legal Description	Title Area
82 Hautapu Road	Lot 1 DPS 13529 BLK VIII Hamilton SD	4.04 HA
n/a	Lot 3 DPS 13529	6.74 HA
n/a	Lot 1 DP 88412	12.04 HA
15 Hanlin Road	Lot 1 DP 458241	1.96 HA
n/a	Lot 2 DP 458241	1.05 HA
n/a	Lot 3 DP 458241	1.04 HA
n/a	Lot 3 DPS 62551	.23 HA
n/a	Lot 2 DPS 62551	2.97 HA
n/a	Lot 1 DPS 88175	.54 HA
n/a	Lot 10 DP197	13.75 HA
n/a	Allot 10A Hautapu PSH	4.04 HA
n/a	Allot 103A Hautapu PSH	1.28 HA
n/a	Lot 1 DP 458241	1.96 HA
Hanlin Road	Parcel ID 4579653	1.71 HA
Hautapu Road	SO 310662	2.73 HA
Hautapu Road/Peake Road Intersection	Parcel ID 4596352	0.08 HA
Peake Road from Hautapu Road to Nagar Lane	SO 496506	2.39 HA
Peake Rd/ Nagar Lane Intersection	Parcel ID 4598986	.12 HA
Peake Road from Nagar Lane to Racecourse Road	Parcel ID 4589016	.72 HA
Peake Road/ Racecourse Road Intersection	Parcel ID 4599083	.06 HA
Peak Road from Racecourse Road to Grasslands Drive	Parcel ID 4602531	1.28 HA
Peake Road/ Grasslands Drive Intersection	Parcel ID 4602528	.04 HA
Peake Road from Grasslands Drive to Cambridge Road	Parcel ID 4585367	1.63 HA
Peake Road/ Cambridge Road Intersection	Parcel ID 4597005	.21 HA
Cambridge Road	Parcel ID 4577915	1.26 HA

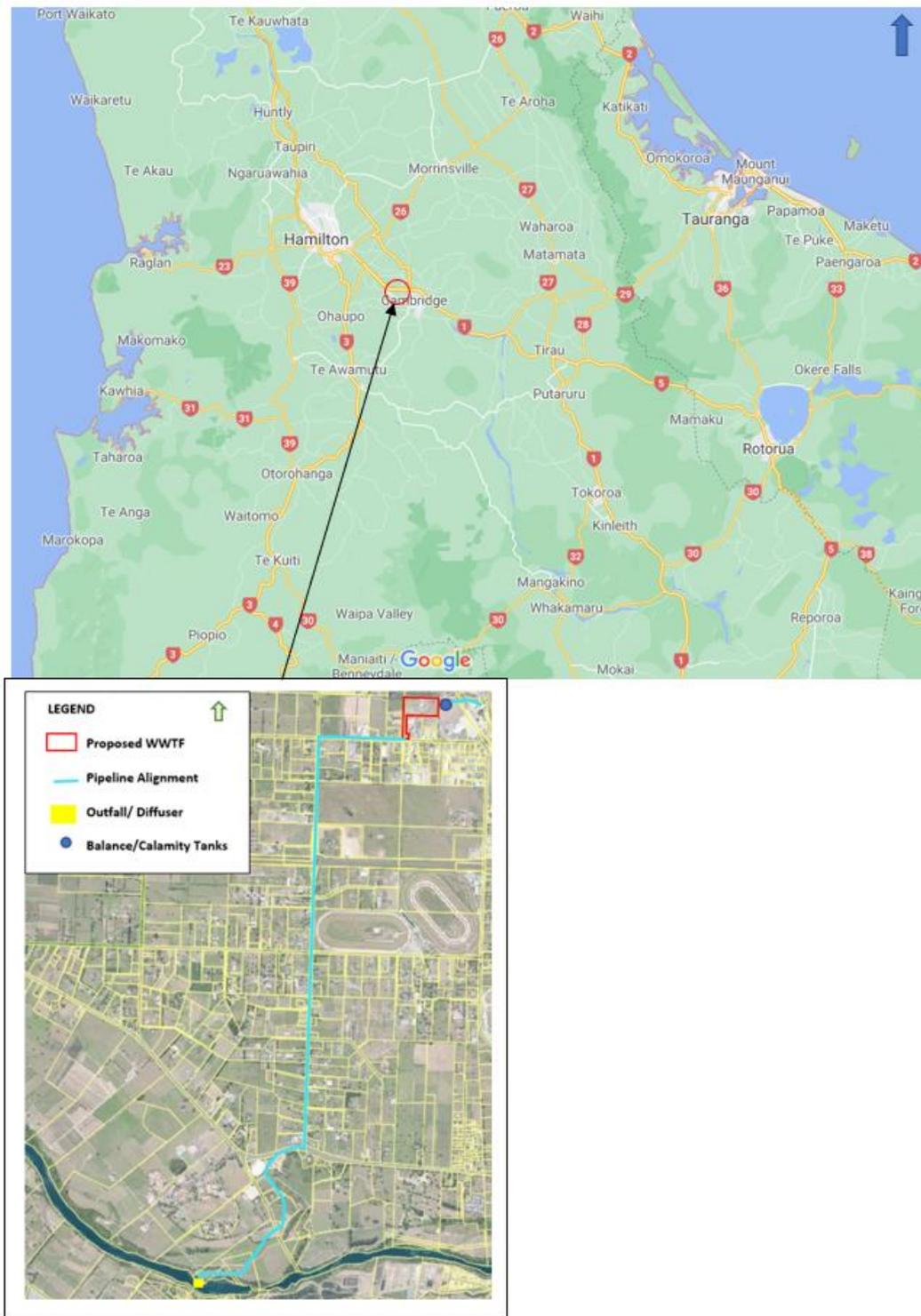


Figure 1. Upper map showing the location of the proposed WWTF development in the regional setting and lower inset showing the local setting. Detailed aerial plans showing the affected properties are provided in Appendix B (source: upper Googlemaps and lower Waipa District Intramaps)



Figure 2. Conceptual layout plan for the proposed WWTF, Balance and Calamity Tanks and pipeline connection to existing wastewater storage facility (source: PDP)

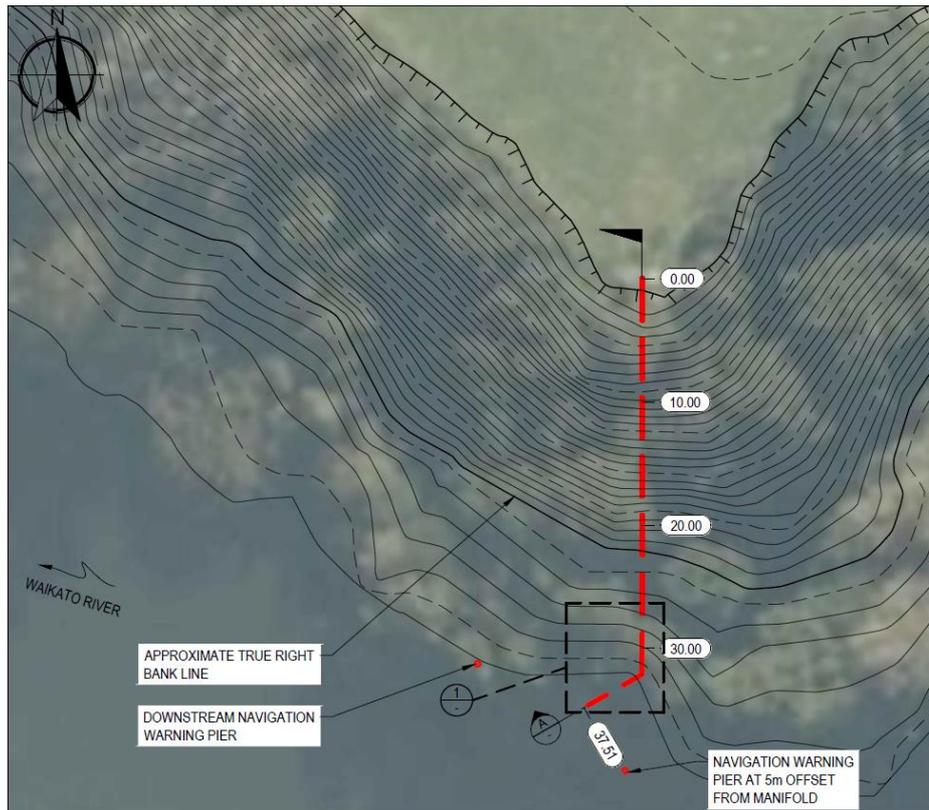


Figure 3. Aerial plan showing the location of the outfall pipe into the Waikato River (source: PDP)



Figure 4. Aerial plan showing the existing riverline pipeline alignment to be upgraded (purple line) and abandoned pipeline (red line) with diffuser location indicated by blue rectangle – to the south of Cambridge Road (source: Fonterra)

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).

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. In the late 18th century there was a major encounter near Ohaupo referred to as the battle of Hingakaka, which saw the defeat of Ngati Toa by the Waikato tribes (Sole 2005: 137).

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. In the early years 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 the 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 the 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 the Maori lands, 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 (aukati) 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 Puniu 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 1acre 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 two redoubts soon commenced. The Star Redoubt was located within the settlement at Cambridge to the east of the current Project Area. The second redoubt, named Pukerimu was located along the north side of the Waikato River. Pukerimu was used as a landing place by the British military from early 1864 and redoubts were built on either side of the 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 two 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. The town lots were able to be provided to the men relatively quickly, however, problems arose with the farm allotments, with 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, shown in Figure 5 (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.

The higher-ranking soldiers fared much better, often receiving better quality land and also being able to combine their 50 acre lots into larger farms. The area to the north of Cambridge on the eastern side of the Waikato River at Hautapu was described as level and unbroken land which was able to be surveyed into 50 acre lots in a rectangular pattern (Allen 1969:81). This area of better-quality land was an exception, with the vast majority of the land allotted to the soldiers being inferior, and overall the military settlement scheme at Cambridge was for the most part considered a failure with only a small number of the soldiers and their families remaining on their land (Cambridge Museum Website).



Figure 5. Plan of the militia farm allotments around Cambridge with the lot containing the location of the proposed WWTF shaded red (source: Allen 1969)

HISTORICAL SURVEY

Information from Early Maps and Plans

Early maps and plans were reviewed to gather information on land ownership and usage. The first area to be reviewed was the lot containing the proposed WWTF. As can be seen in the undated plan of the military settlement at Cambridge in Figure 6, this was Allotment 89 which was granted to Charles Holt, but by 1885, as can be seen in the plan from that year shown in Figure 7, Allotment 89 was now owned by Jared Allwill. The plan also shows the Allwill Homestead located in Allotment 88. According to the information provided in his obituary, Allwill emigrated to New Zealand from Ireland, arriving in Auckland in 1862. He moved to Cambridge in 1871 and purchased a 101 acre holding from a soldier (*Waikato Independent* 24 August 1922). He later purchased adjacent properties, increasing his farm to 240 acres which included Allotments 88, 89, 91, 27 and 28 and named his farm 'Redwood'. According to a land sales notice for part of the Redwood Estate in the *Waikato Independent* dated 3 May 1919, the location was described as:

‘adjoining the Hautapu Railway Station and the Cambridge Dairy Company’s Butter, Cheese and Dried Milk Factories’ and situated on “level land in heavy permanent dairying pasture, and is well watered by windmills, tanks, dams and concrete troughs.’

Allwill was a prominent personality in the Cambridge area and apart from dairy farming, he was the first to import pure Thoroughbred and Clydesdale horses in the Waikato District. He was also a foundation shareholder of the Cambridge Dairy Cooperative and a Director from 1901-1903 (Cambridge Museum Website). The Allwill family connection with the property at Hautapu did not end with Jared’s death as his daughter Violet farmed 40 acres at Hautapu for many years and, as can be seen on the 1969 plan in Figure 8, the name Violet Isabel Allwill is annotated in the small triangular lot in the southeast corner of Allotment 89. This plan also shows the subdivision that created Lot 1 DPS 13529, where the proposed WWTF is located. As can also be seen in Figure 7 and Figure 8, a railway reserve was located in the eastern end of Allotment 89. This was the site of the former Hautapu Railway Station, which opened in 1884.

The map in Figure 9 shows the broader Cambridge Area including Hautapu. The map comes from a 1939 book by C.W. Vennel on the history of Cambridge. As can be seen on the map, a track is located to the north of the proposed WWTF and a settlement ‘Arikirua’ is also shown (Vennel 1939).

The area between Cambridge Road and the Waikato River contains the southern part of the existing pipeline which connects to a diffuser which is situated in the river. The land in this area was also granted to the men of Third Waikato Militia. As can be seen in the undated plan in Figure 10, the riverline pipeline passes through allotments with the names George Montgomery (Lot 156), Isaac Ferris (Lot 102) and William Reynolds (Lot 103). George Montgomery was born in Ireland in 1839 and enlisted in the 3rd Waikato Militia in 1865 as a substitute soldier (Private) and his occupation was listed as labourer. He owned the property in 1870 as he was listed in the rates assessment for 1869-70 (Cambridge Museum Website). Isaac Ferris is listed as being in the Third Waikato Militia, but additional information was not found during the research for this report. As noted above, Lot 103 has the name William Reynolds annotated. Reynolds received his military grant elsewhere and later added Lot 103 to his land holdings. He died at the young age of 29 in 1872 from a fall from his horse and his father inherited his land (Cambridge Museum Website).

A plan from 1912 shown in Figure 11 for a subdivision of land in Allotment 104 to the northwest of the proposed pipeline (which is located in Allotment 102) shows that Allotment 102, originally granted to Isaac Ferris now has the name 'Ewen' annotated. The earliest plan of a subdivision of the allotments containing the riverline pipeline found during the research for this assessment was from 1932/33 in Allotment 156 (Figure 12), which shows a survey plan and a survey for land transfer. The newly formed lots were located along the eastern side of Hanlin Road (which is marked as formed to the southern boundary of Lot 3 on the plan). The lots were surveyed for the Waipa County Council and the survey plan is entitled Cambridge Gravel Quarry. This plan also has the name Hanlin annotated on the remaining part of Allotment 156 (to the east of the newly subdivided lots). The names E.J. and A.T.S. Hanlin are annotated on a 1941 plan for changes to roading along Cambridge Road which brought the alignment of the road to the south of the original location, removing a sharp corner in the road (Figure 13). The names marked on the plan in Figure 13 are Eliza Jane and Alice Hanlin, who were the daughters of Michael Hanlin, a member of the Third Waikato regiment, who had been granted land on the northern side of Cambridge Road (Cambridge Museum Website).

The plan in Figure 10 also shows the presence of two reserves in this area, both bordering the Waikato River. The larger of the two is labelled Military Reserve and is the location of the former Pukerimu Redoubt. This was one of two redoubts built on opposite sides of the Waikato River and both locations also included landings. The main redoubt was on the southern side of the river and was used by General Cameron as his headquarters. The northern redoubt was established in late March 1864. The redoubts were garrisoned by soldiers of the 18th and 70th Regiments who were later replaced by colonial forces. The plan in Figure 9 shows the two redoubts at Pukerimu with the southern one labelled 'Cameron's Redoubt' (NZZA Site Record S15/99). A small triangular-shaped parcel of land (101A) is located just to the west of the military reserve with 'Perm. Res.' and 'Reserved by Regulation under the Waste Lands Act 1854' annotated for 103A in Figure 10. The Wastelands Act dealt with issuing of Regulations on the sale and disposal of unused (wastelands) Crown lands. A later survey from 1962 in Figure 14 also shows a survey plan of this reserve.

The pipeline joining the proposed WWTF to the diffuser is located in road reserves on Hautapu Road, Peake Road and Cambridge Road. All of these roads were laid out as part of the military settlement, as can be seen on the plans showing the original layout (Figure 15). When compared with modern maps the road layouts, apart from the 1941 change in alignment to Cambridge Road, as shown in Figure 13, remain the same. It should be noted that some further minor adjustments and improvements to the roads have also taken place over the years.

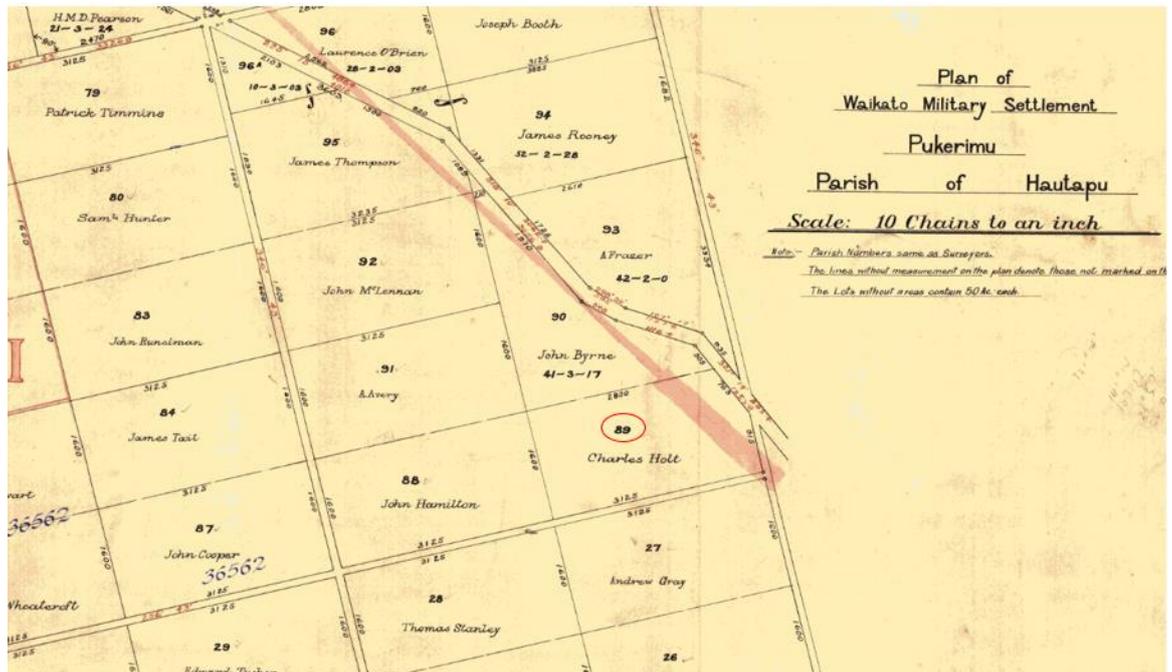
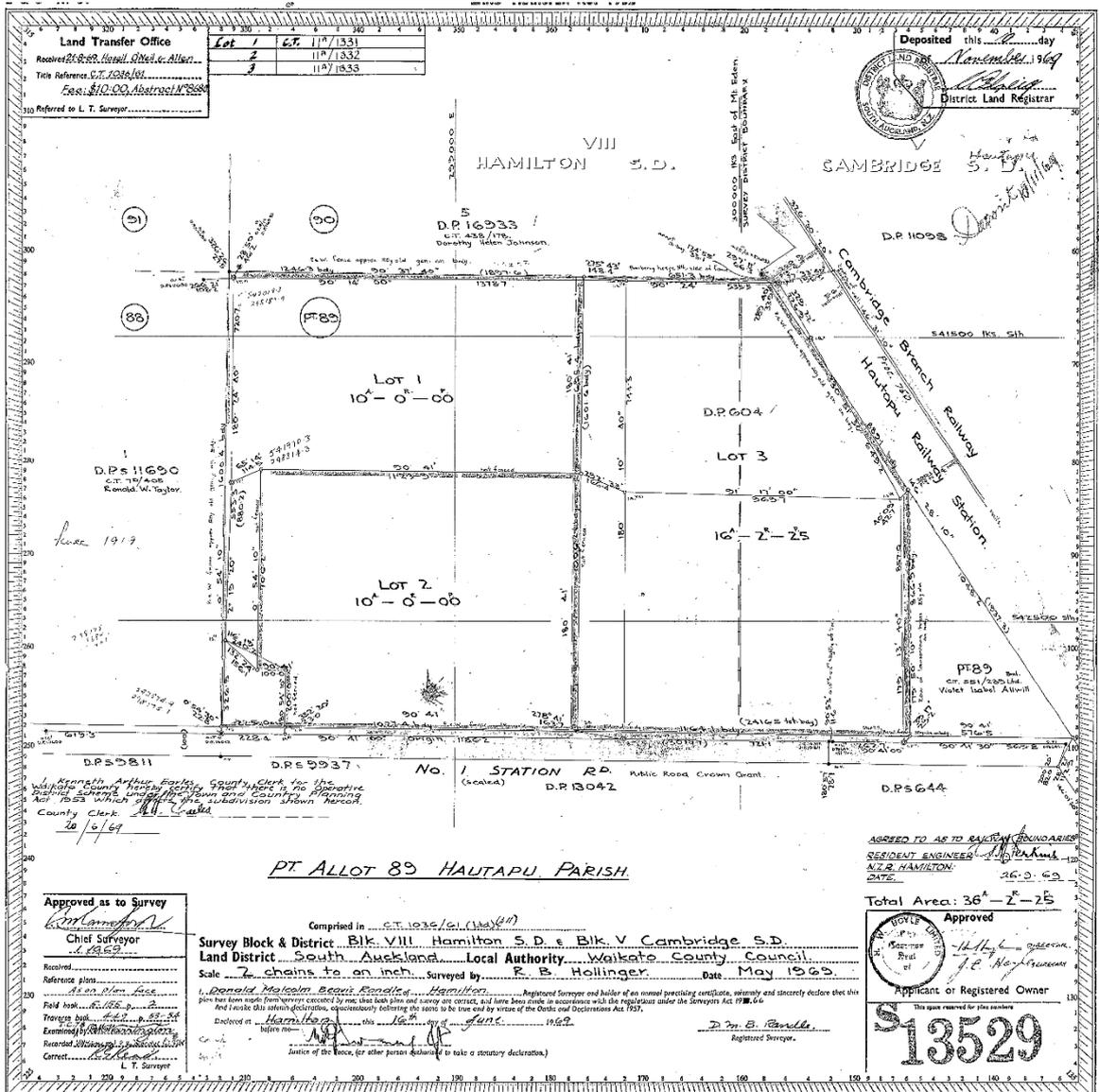


Figure 6. HNC SO 96 1 (undated) plan showing the Waikato Military Settlement lots with the proposed WWTF location being in Lot 89 (circled in red) with ‘Charles Holt’ annotated (source: Quickmap)



Land Information New Zealand, Custom Software Limited, Date Scanned 2002, Last modified , Plan may not be current as at

Figure 8. HN DPS 13529 plan dated 1969 showing the subdivision that created the current lot proposed for the WWTF (Lot 1 on the plan)

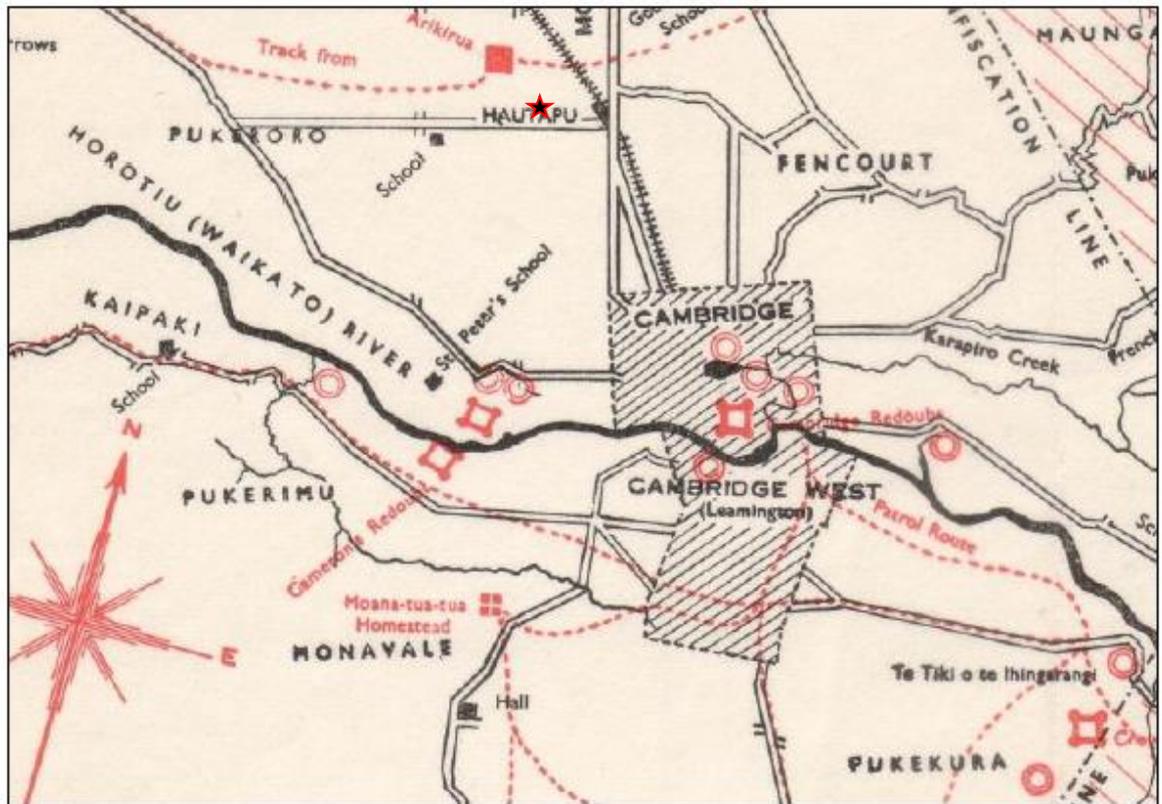
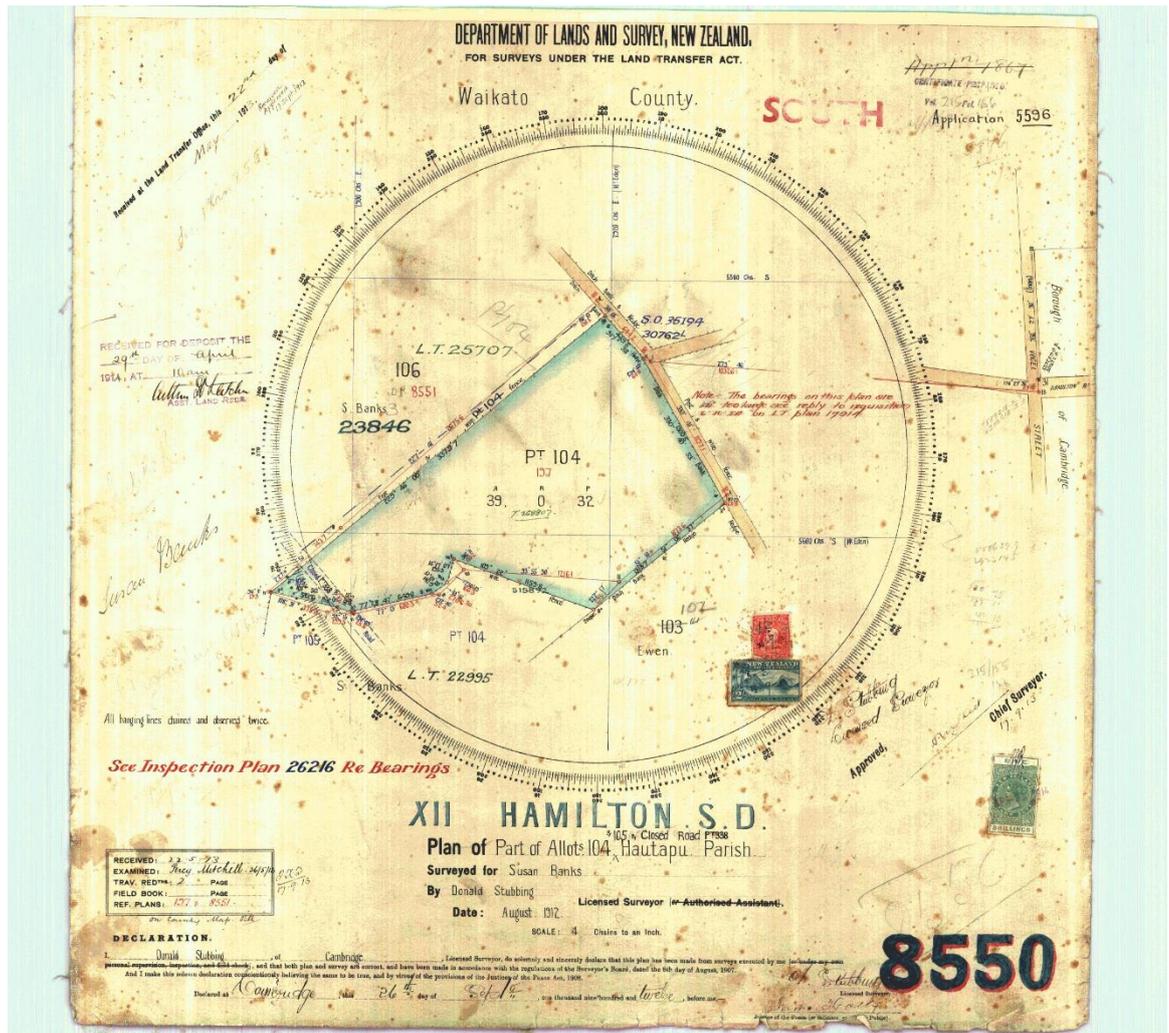


Figure 9. Map produced in 1939 with the location of the proposed WWTF marked by red star with old track and village marked to the north and with the two Pukerimu redoubts shown on either side of the Waikato River (source: from NZAA Site Record S15/99- taken from *Such Things Were: The Story of Cambridge New Zealand*, by C.W. Vennell 1939)

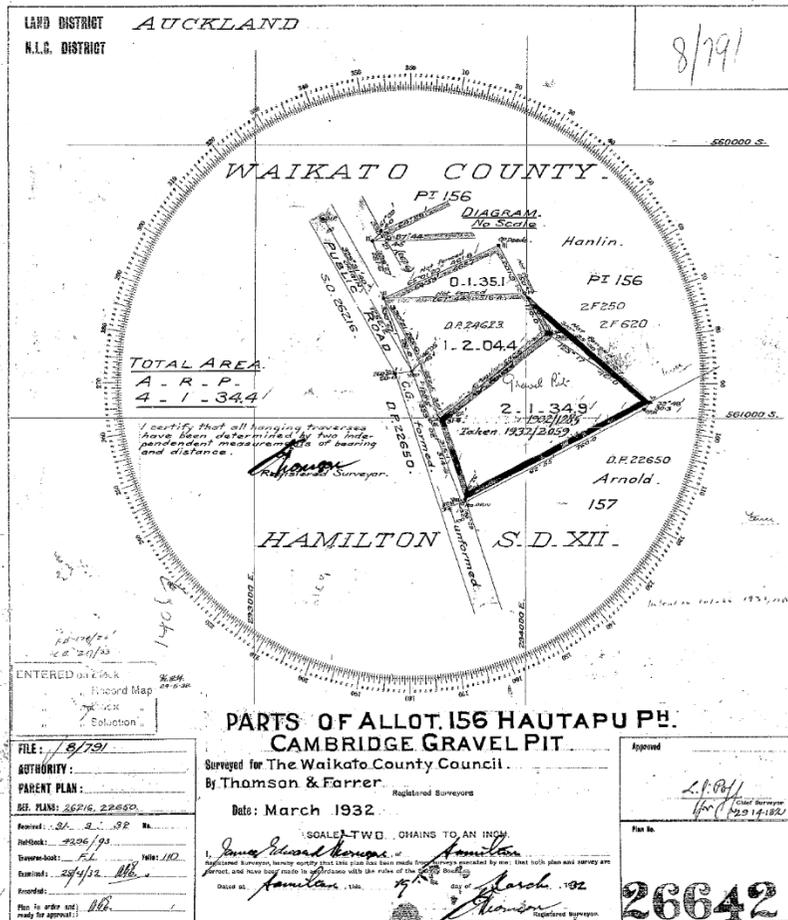


Figure 10. Detail from HNC SO 96 3 (no date) entitled 'Plan of Waikato Military Settlement Pukerimu Parish of Hautapu' with estimated alignment of the riverline pipeline upgrade shaded in blue (source: Quickmap)



Land Information New Zealand, Custom Software Limited, Date Scanned 2002, Last modified November 2002, Plan is not current as at 10/04/2021

Figure 11. HN DP 8550 I dated 1912 with Lot 102 (corrected in pencil) with the name Ewen annotated (source: Quickmap)



Land Information New Zealand, Custom Software Limited, Date Scanned 2002, Last modified November 2002, Plan is not current as at 10/10/2021

Land Information New Zealand, Custom Software Limited, Date Scanned 2002, Last modified November 2002, Plan is not current as at 11/04/2021

Figure 12. Left, HN DP 26642 dated March 1932 ('Cambridge Gravel Pit'); and Right (dated March 1933), plan showing a subdivision in parts of Allotment 156 undertaken for Waikato County Council (source: Quickmap)

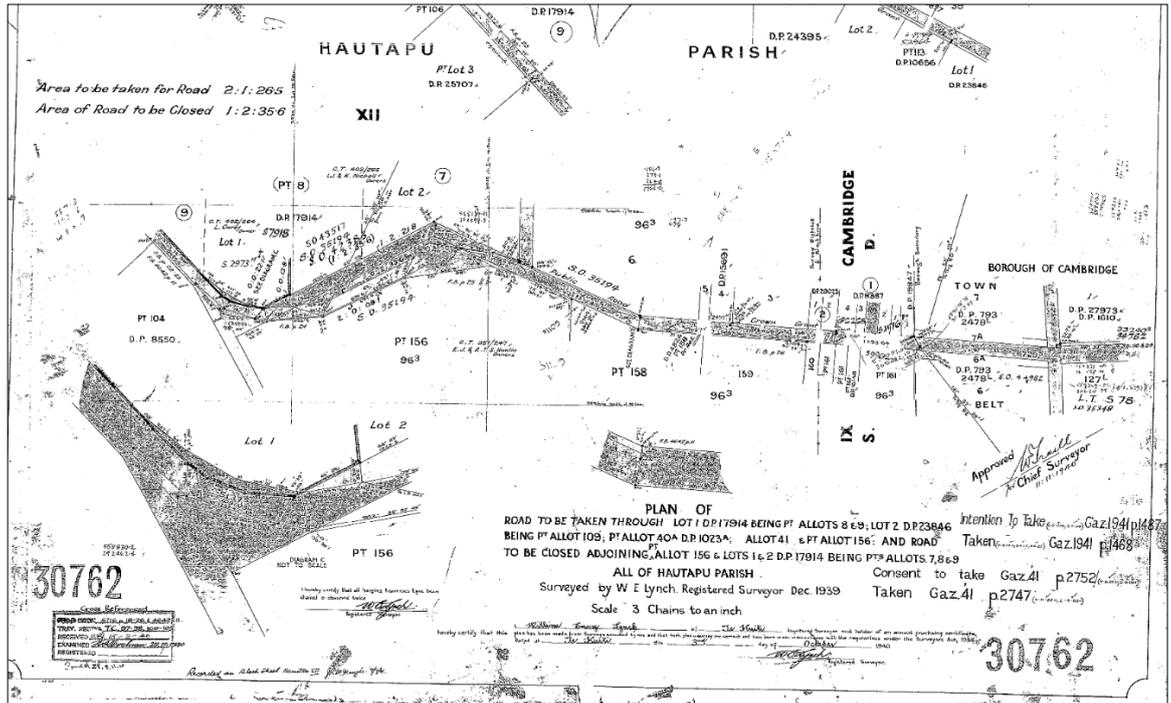
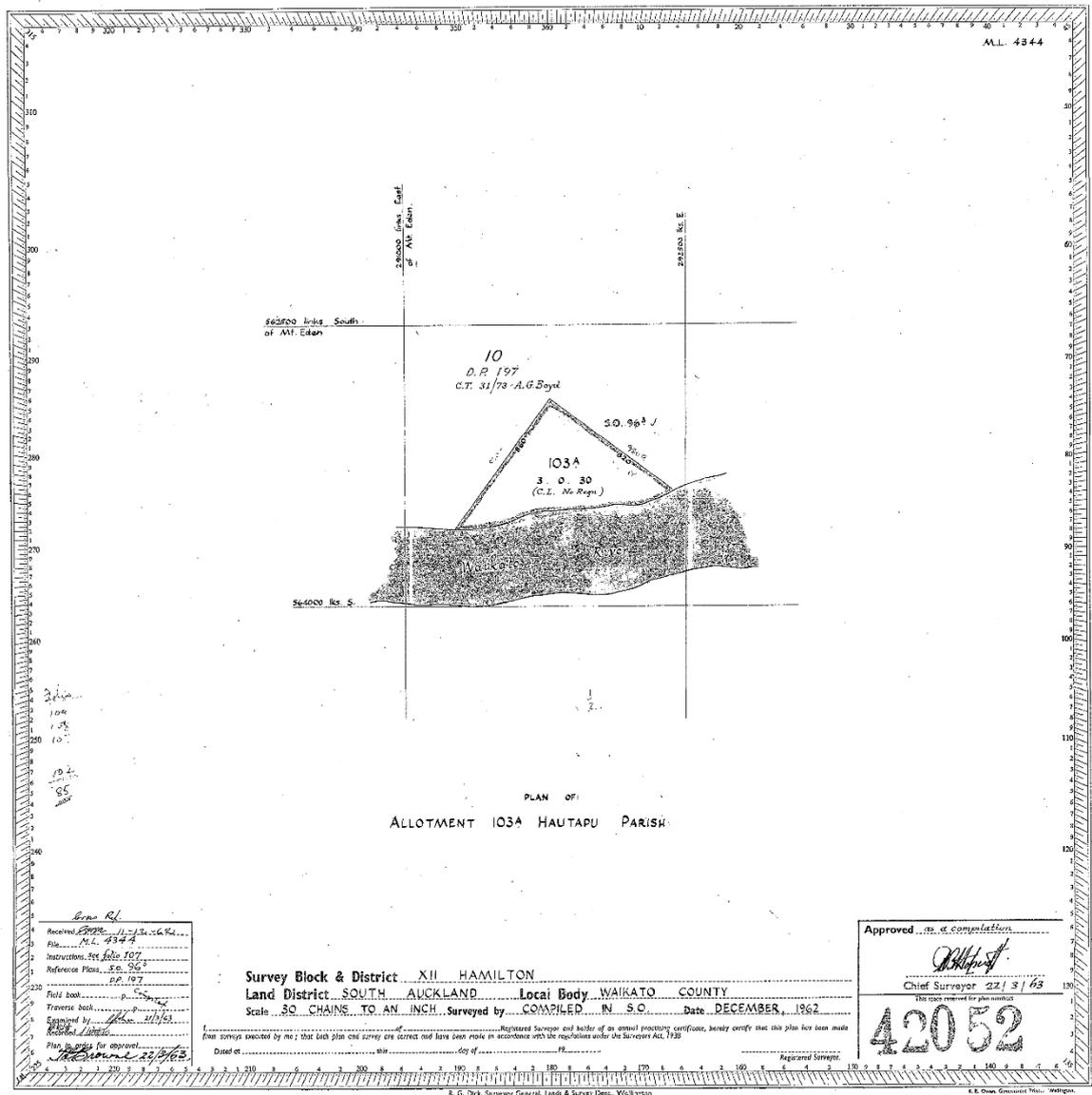


Figure 13. HN SO 30762 I Plan for closing and land to be taken for roads dated 1941 with Pt. Allot 156 annotated with the names E.J. and A.T.S. Hanlin (source: Quickmap)



Land Information New Zealand, Custom Software Limited, Date Scanned 2002, Last modified November 2002, Plan is not current as at 10/04/2021

Figure 14. HN SO 42052 dated 1969, plan showing Allotment 103A (source: Quickmap)

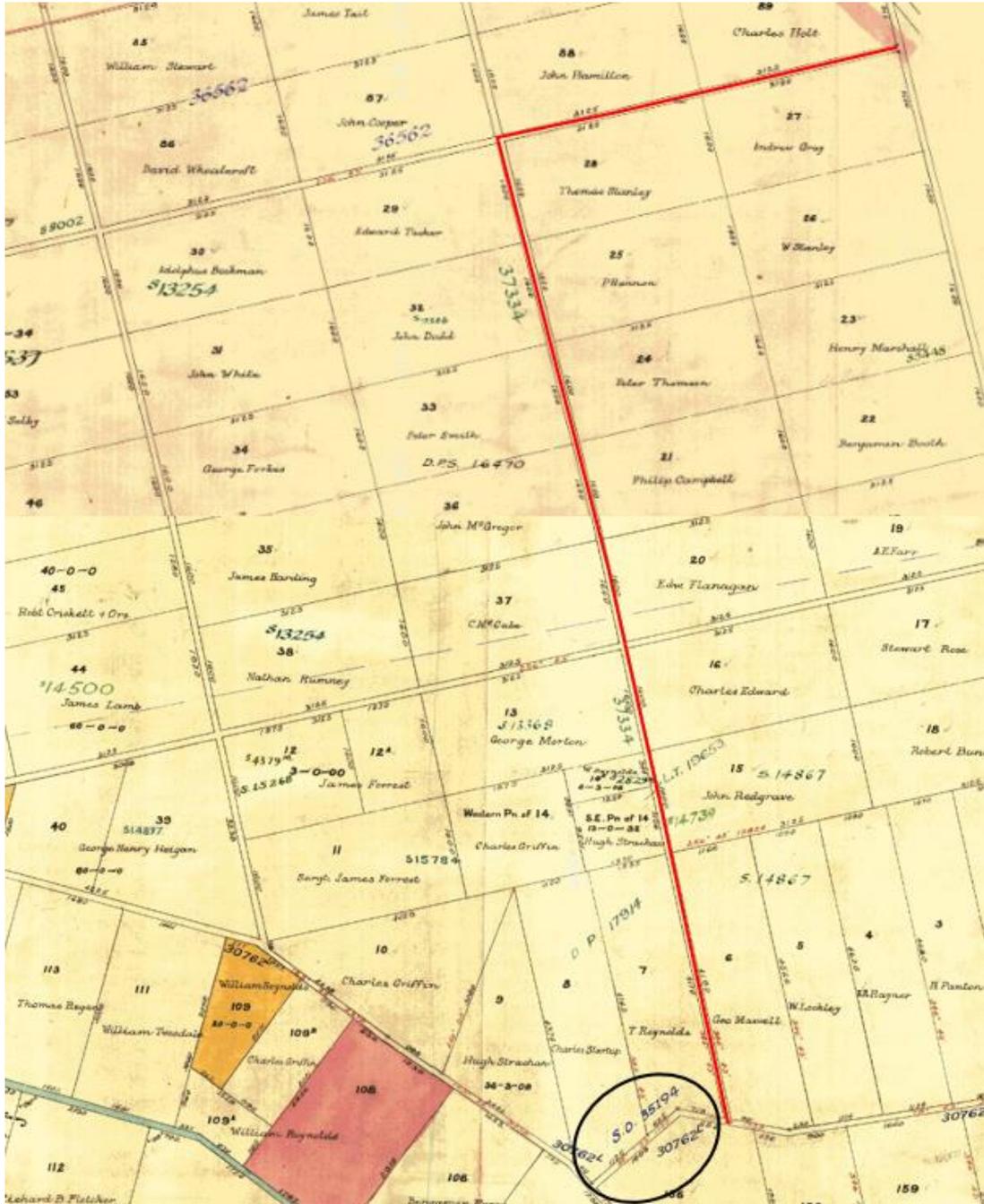


Figure 15. HNC SO 96 (1) and (3) stitched together showing the Hautapu Road and Peake Road marked by red line and old alignment of Cambridge Road in black circle (source: Quickmap)

ARCHAEOLOGICAL BACKGROUND

Recorded Archaeological Sites

There are 16 recorded archaeological sites within the footprint or in the near vicinity (within c.200) of the proposed upgrade works for the riverline pipeline. Most of these sites have been recorded as Maori horticultural sites (borrow pits). It should be noted that although they have been recorded as borrow pits, additional archaeological features and deposits would also be expected to be present, including gardening soils which can extend over large areas surrounding the borrow pits. The location of the overall project works in relation to these archaeological sites is shown in Figure 16 with more detailed maps in Figure 17 and Figure 18. A summary description of the sites is provided in Table 2.

There are no recorded archaeological sites in the property containing the proposed WWTF. The closest site is the former Hautapu Railway Station (S15/769), which opened in 1884. The site is located at the Fonterra factory and the proposed pipeline that will connect the WWTF to the existing wastewater storage facility crosses the northern part of the railway reserve where the station was situated. The site was recorded during desk-based research for installation of a pipeline along Victoria Road and has not been visited (NZAA Site Record).

There are four recorded sites in the vicinity of the riverline pipeline on Peake Road. These have all been recorded as borrow pits. S15/604 and S15/605 are the two most northerly of these sites. Both are single borrow pits recorded from 1943 aerial photographs and neither of these sites has been visited. S15/414 is located to the west of Peake Road and just south of the Waikato Expressway. Two borrow pits were identified at this location during a 2007 survey. It was also noted in 2011 that the site had been heavily modified through farming activities (NZAA Site Record). The final two sites in this area are located near the southern end of Peake Road, in paddocks just to the north of Cambridge Road. S15/606 is also a single borrow pit recorded from a 1943 aerial photograph (NZAA Site record).

The remaining 11 archaeological sites are located between Cambridge Road and the Waikato River. Two of these are pa sites S15/68 and S15/69. The pipeline alignment passes through the recorded extent S15/68, in an area where gardening soils have been recorded in the past, as can be seen in Figure 18. The site is situated on a promontory on the edge of a gully and cut off by at least two defensive ditches. Pa site S15/69 is located to the southeast of the riverline pipeline on a promontory to the east of S15/68. This site has never been investigated but a ditch and bank were identified from aerial photographs. This location has undergone modification from house construction on part of the site. S15/668 and S15/710 are located in a paddock to the south of the pa site S15/68. Both of the sites have been recorded as borrow pits. S15/668 was identified during a survey for the assessment of the existing riverline pipeline in 2012. It consists of a single borrow pit feature measuring 10m x 11m located in an area used for equestrian activities by St Peter's School. A test pit was undertaken and infilled soils were estimated to be present to c.1m below the surface (Phear and Clough 2012). Seven of the remaining sites in this area were also recorded as borrow pits identified from 1943 aerial photographs. These are S15/500 (18 borrow pits), S15/501 (three borrow pits), S15/502 (four borrow pits), S15/503 (nine borrow pits), S15/633 (single borrow pit), S15/709 (seven borrow pits) and S15/710 (seven borrow pits). The riverline pipeline passes through features (borrow pits and garden soils) associated with recorded archaeological sites S15/501, S15/502, S15/503, S15/668 and S15/710. Apart from S15/668, the only other one of these sites that has been visited is

S15/503, which was visited in 2018. During this site visit it was noted that several borrow pits were still visible although some damage was noted.

The final recorded site in this area is S15/99, the Pukerimu Redoubt. A 2018 site visit noted that there is no surface evidence remaining but subsurface evidence is considered likely to be present. The redoubt is also associated with a landing, where it was accessed from the Waikato River. There are two estimated locations for the landing, both to the east of the existing outfall and diffuser location (NZAA Site Record).

Archaeological Landscape

The recorded archaeological sites in the general area containing the proposed works 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.

A report on the state of pre-European Maori garden sites in Waipa District was undertaken in 2013 (Gumbley and Hutchinson 2013). Sites were identified remotely through identification of borrow pit features on 1943 aerial photographs. The results indicated that these sites were most commonly found near the Waikato River with 78% of the identified sites located within 1km of the river and 51% within 500m. With regards to Cambridge and North Leamington, the same study found that whilst approximately 80% of borrow pits were found to be within 1km of the Waikato River, these features were also still found to occur in high numbers up to 3.5km north of the river and 3km to the south of the river (Gumbley and Hutchinson 2013:29).

The works proposed for the construction of the proposed WWTF, riverline pipeline/outfall upgrade and diffuser replacement are situated between 0–4km north of the Waikato River. The section to the south of Cambridge Road lies within 1km of the river and, not surprisingly, the majority of recorded archaeological sites are in this area. The sites, apart from the Pukerimu Redoubt, are part of the Maori archaeological landscape with both living and horticultural sites included. The aerial plan in Figure 19 of the area between the Waikato River and the southern part of Peake Road shows the estimated pipeline alignment in relation to these features. As can be seen the pipeline runs through areas of gardening soils and borrow pits that have been identified on the plan at S15/501, S15/502, S15/503, S15/668 and S15/710. As the defined extents of these sites, along with that of S15/68 (pa), will be directly impacted by the proposal, the NZAA Site Records are appended to this report for reference.

Mapping of the borrow pits and surrounding garden soils as seen in the plan in Figure 19 has increased our understanding of the pre-European archaeological landscape in the broader Waikato region, including Waipa District, although more detailed information about the individual sites, the relationship between sites and how they fit into the overall archaeological landscape can only be provided through archaeological investigation.

Previous Archaeological Investigations

Several sites in the vicinity of the project area listed above have been examined archaeologically. Excavations at site S15/414 were monitored by archaeologists as part of the construction of the Waikato Expressway as two borrow pits had been identified through aerial photograph review and a previous survey. No archaeological remains were identified during the archaeological monitoring (NZAA Site Record). Site S15/606 was included in the archaeological monitoring for road improvements at Cambridge and Hanlin Roads. Again no archaeological features or deposits were identified and the conclusion was that it was likely that any archaeological evidence that may have been present in the area monitored was destroyed many years ago by previous roadworks (NZAA Site Record).

The pa site S15/68 is located in an area that has undergone several previous modifications from development, including the construction of the Te Awa Cycleway, installation of electricity pylons, a playground and the existing riverline pipeline. This part of the pipeline was installed in 2012 to divert around the velodrome that was being constructed at that time. Construction works for the pipeline were commenced in December 2012, but as they were found to be located within the extent of S15/68, works were stopped by the NZ Historic Places Trust (now Heritage NZ) and an archaeological assessment was prepared (Phear and Clough 2012). The field survey included inspection of the already excavated trench, where no archaeological remains were identified. Archaeological monitoring was carried out for the remaining sections at and in the vicinity of S15/68 and no archaeological remains were identified. Archaeological monitoring/ investigation was also carried out at S15/68 in 2014 for the construction of the Te Awa Cycleway. Four archaeological features were recorded: an oven, a basin-shaped depression, a section of the outer defensive ditch and a pit (Gumbley and Hutchinson 2014). Monitoring also took place at S15/68 during works for foundation maintenance of a power pylon in 2016 which involved excavation of the soil around the footings and reinstatement with concrete. Seven archaeological features (post holes and fire scoops) were identified. Works for fencing around the power pylons were also monitored, but no archaeological remains were identified (Trifford April 2016). Additional works at S15/68 for playground construction were also carried out during 2016. Monitoring of the works, which consisted of auger holes dug for playground pole structures (to a depth of c.1200mm) and turfing in the topsoil did not expose any archaeological features. The report notes that the turfing works did not expose the subsoil and archaeological remains could still be present (Trifford December 2016).

Site S15/503 was first recorded remotely as a cluster of nine borrow pits in paddocks adjacent to the Waikato River. Part of the new Cycleway River Ride passes through this site and a field visit was undertaken in 2018, which noted that some of the borrow pits were still able to be identified from surface evidence. The area is being monitored during the cycleway construction and a report will be submitted once the project has been completed (NZAA Site Record).

Table 2. Summary description of archaeological sites in close proximity to the proposed works (within c. 200m), with sites within the footprint of proposed works shaded grey

NZAA #	Site Type	Description	NZTM Easting	NZTM Northing
S15/68	Pa	Located on a high point of land and defended by two ditches. Associated gardening soils identified.	1814279	5803623
S15/69	Pa	Located on a promontory cut off by a ditch and bank. House present on part of site.	1814489	5803628
S15/99	Military/ Non Maori	Located on raised land north of the Pukerimu Landing. 2018 visit noted there is no surface evidence remaining. Subsurface remains likely to be present.	1813878	5802887
S15/414	Maori Horticulture	Originally recorded as two borrow pits. Archaeological Investigation did not identify any archaeological remains.	1814470	5805904
S15/500	Maori horticulture	Eighteen borrow pits identified from 1943 aerial photograph. Not visited.	1813874	5803130
S15/501	Maori Horticulture	Three borrow pits identified from 1943 aerial photograph. Not visited.	1814146	5803101
S15/502	Maori Horticulture	Four borrow pits identified from 1943 aerial photograph. Not visited.	1814091	5802907
S15/503	Maori Horticulture	Nine borrow pits identified from 1943 aerial photograph. Visited in 2018.	1813771	5802817
S15/604	Maori Horticulture	Single borrow pit identified from 1943 aerial photograph. Not visited.	1814501	5806965
S15/605	Maori Horticulture	Single borrow pit identified from 1943 aerial photograph. Not visited.	1814408	5806949
S15/606	Maori Horticulture	Single borrow pit identified from 1943 aerial photograph. Recent archaeological monitoring did not find any evidence of the site – considered destroyed.	1814427	5803820
S15/607	Maori Horticulture	Single borrow pit identified from 1943 aerial photograph. Not visited.	1814228	5804063
S15/633	Maori Horticulture	Single borrow pit identified from 1943 aerial photograph. Not visited.	1814274	5802898
S15/668	Maori Horticulture	Single borrow pit, soil testing could not confirm the nature of the feature.	1814293	5803372
S15/709	Maori Horticulture	Seven borrow pits identified from 1943 aerial photograph. Not visited.	1814036	5803361
S15/710	Maori Horticulture	Seven borrow pits identified from 1943 aerial photograph. Not visited.	1814296	5803345
S15/769	Transport/ Communication	Location of the former Hautapu Train Station - now occupied by Fonterra factory.	1815735	5807043

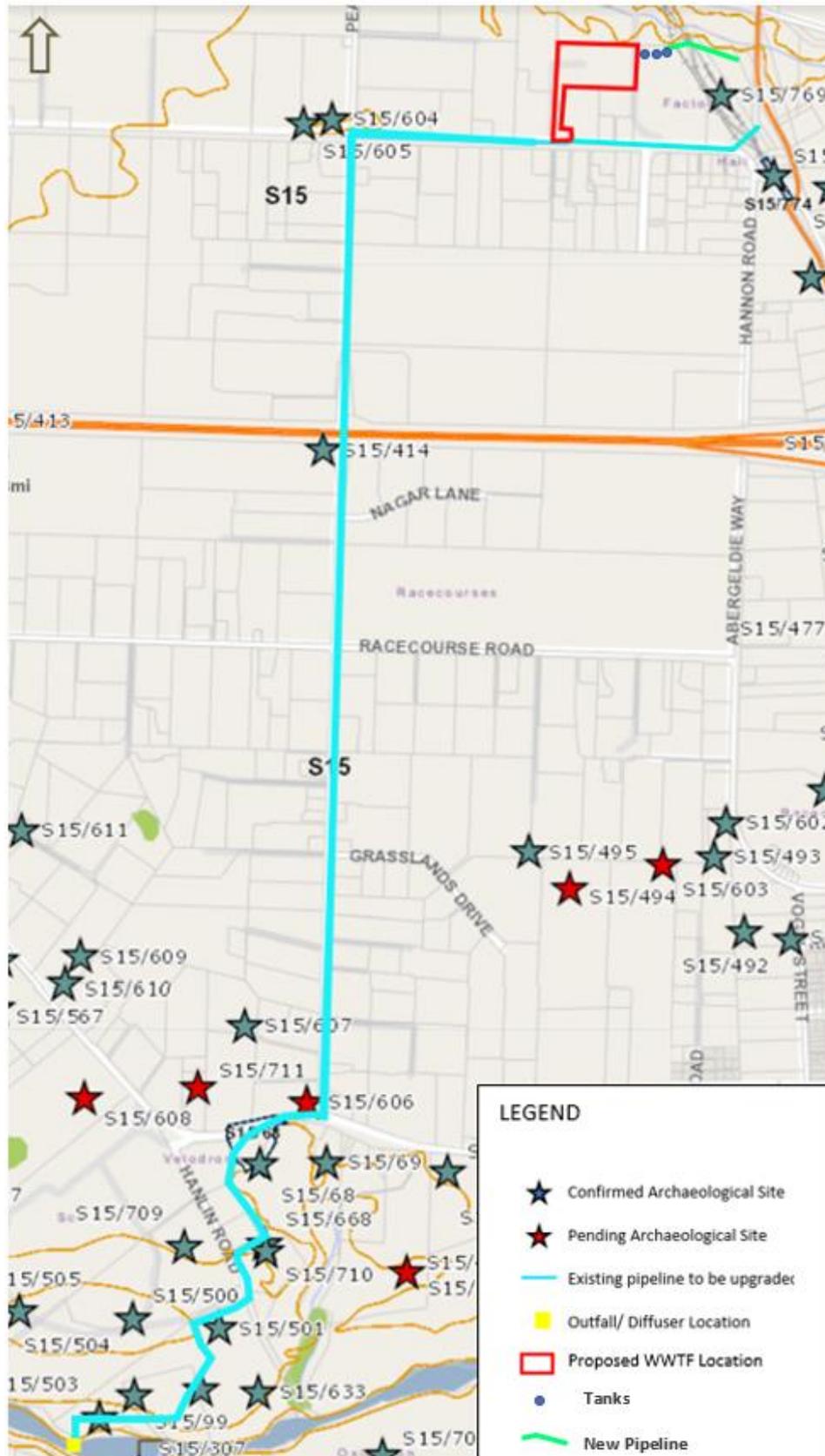


Figure 16. Map showing the archaeological sites in the general area around the proposed works (source: NZAA ArchSite)

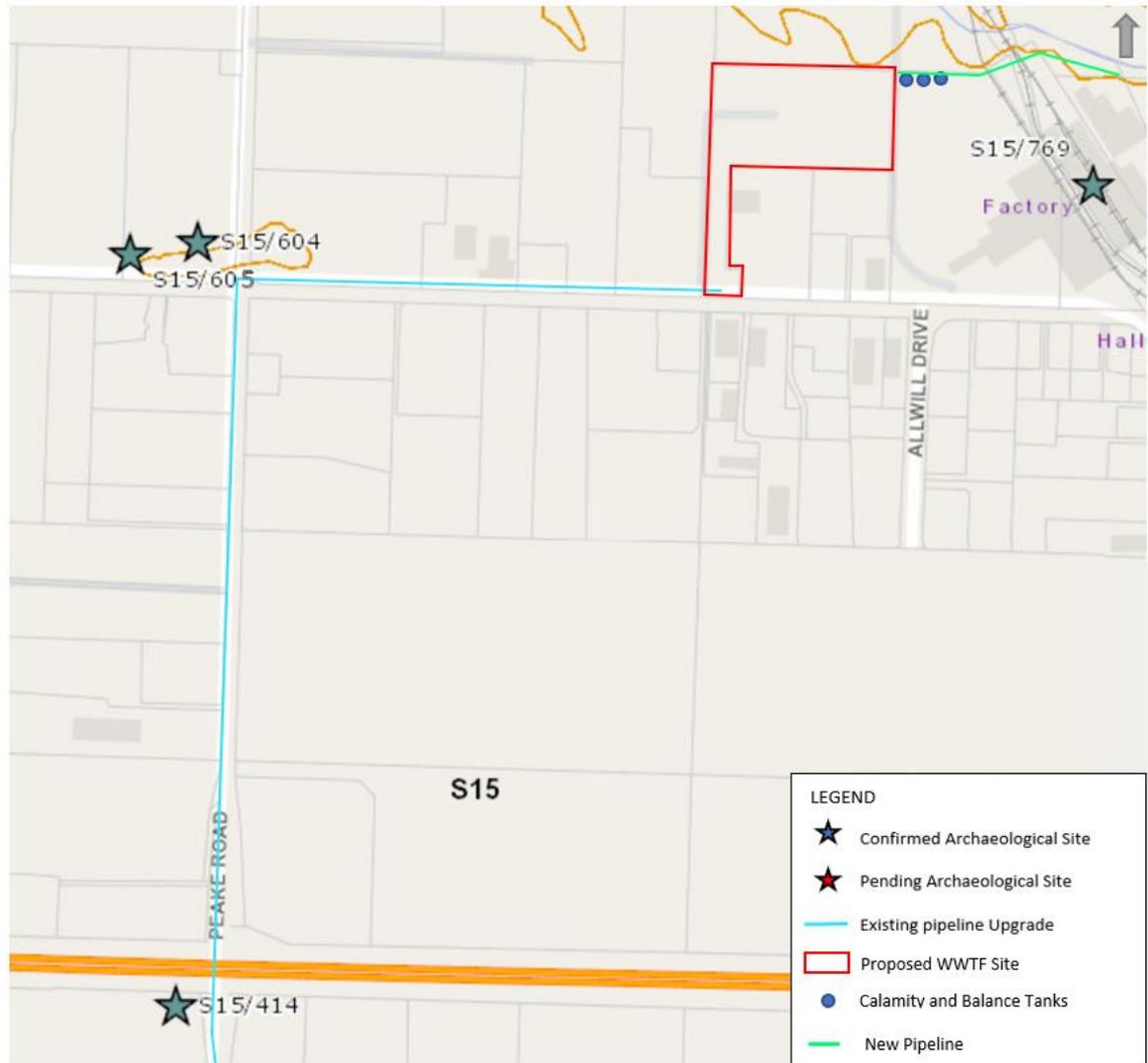


Figure 17. Detailed map showing the archaeological sites in proximity (c.200m) to the proposed works near the WWTF and northern part of Peake Road (source: NZAA ArchSite)

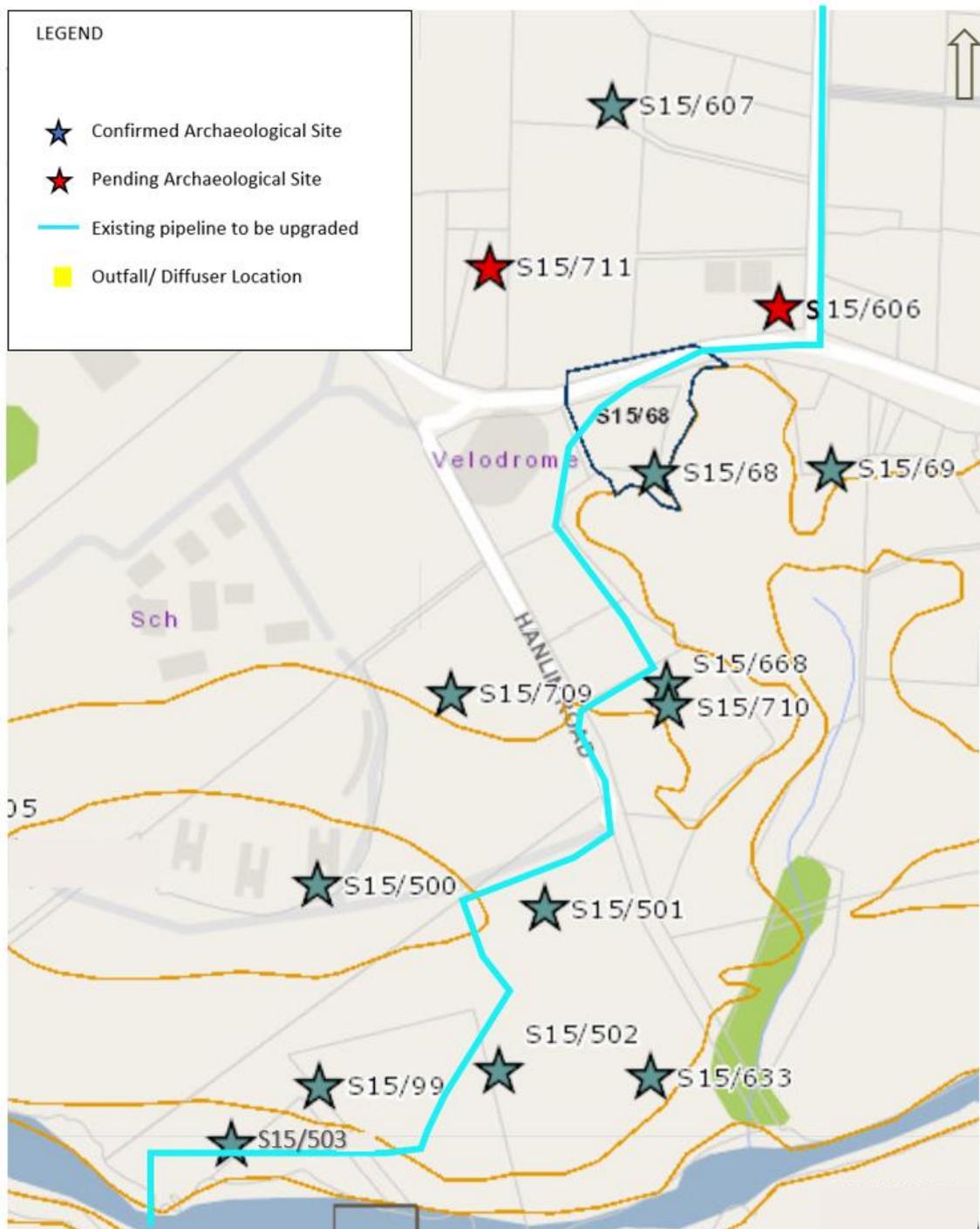


Figure 18. Detailed map showing the archaeological sites in proximity (c.200m) to the proposed works on the southern part of Peake Road and from Cambridge Road to the Waikato River (source: NZAA ArchSite)

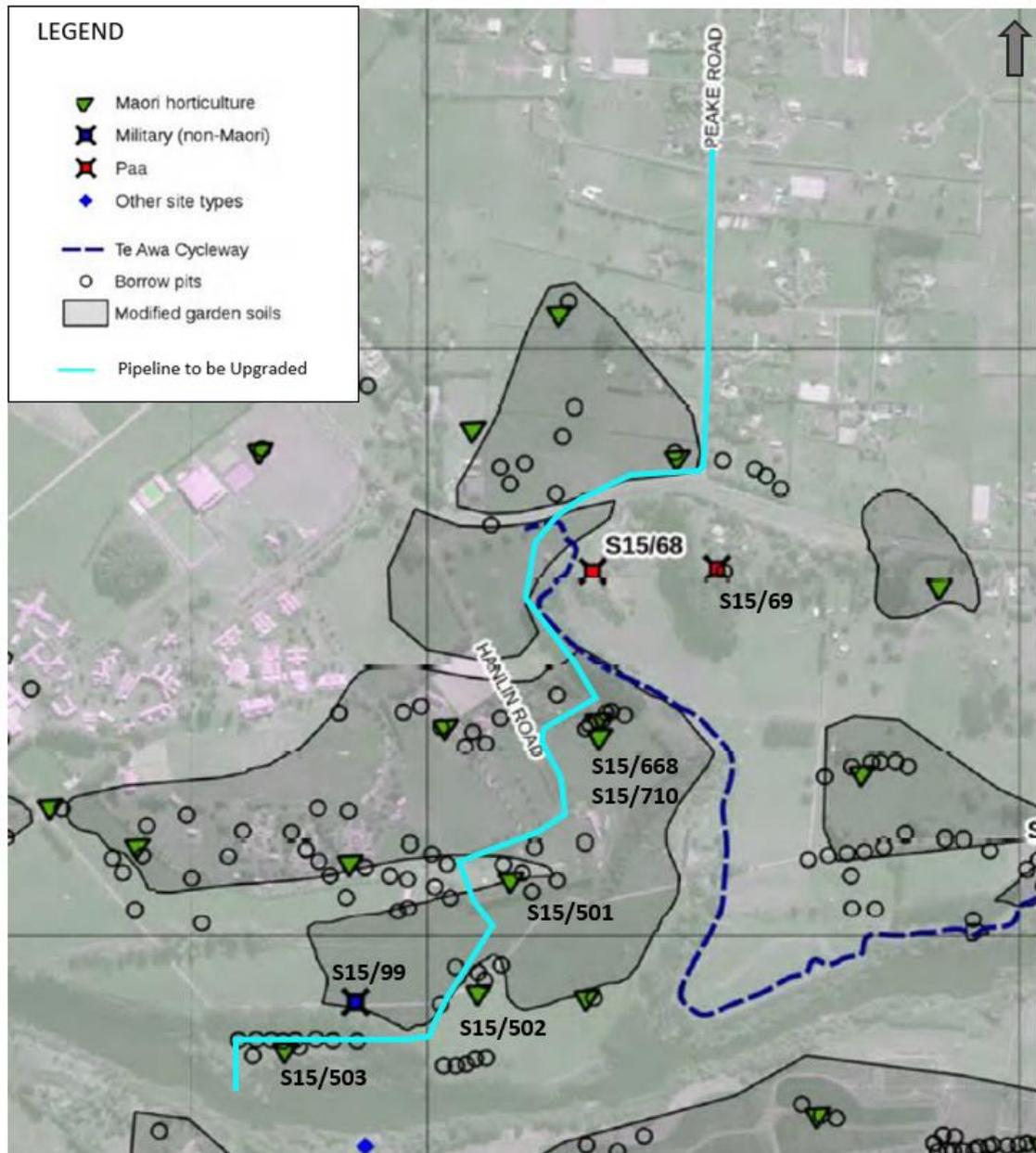


Figure 19. Aerial plan with overlays showing the locations of recorded archaeological sites, borrow pits and gardening soils between the southern part of Peake Road and the Waikato River (source: Gumbley and Hutchinson 2014)

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 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 20). 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 22,000 and 17,000 years ago and the deposits above the surface consist of numerous thin tephra layers (ibid.).

The proposed WWTF site is underlain by the Hinuera Formation and alluvial deposits associated with the Mangaone Stream, which lies c.70m to the north, described as alluvial and colluvial sand, silt, mud and clay with local gravel and peat beds. Geotechnical testing for the current project was conducted on the site in November 2020 and included 14 machine-dug test pits (locations shown in Figure 21). The test pits were all excavated to depths containing Hinuera Formation material. In general the Hinuera formation was encountered between 0.30m and 1.5m (bs). The only exception was the area in the northeast corner of the property where test pit 1 was located, which had been used for waste disposal in the past and showed soil disturbance and modern rubbish to a depth of 1.9m (bs). Test pit 2 contained a thick silt layer over Hinuera Formation material, which was encountered at 1.5m (bs). Test pits 3, 4, 7 and 8 showed silt overlying a tephra subsoil. The depths from surface to the tephra layer were 70cm (bs) in test pit 3, 20cm (bs) in test pit 4, 50cm (bs) in test pit 7 and 30cm (bs) in test pit 8. The areas around the existing buildings contained layers of gravel and sand fill directly over Hinuera formation material (test pits 5 and 6). Test pits, 9, 10, 11 contained silt and sand layers, from surface to 50cm (bs) deposited directly over Hinuera formation material, this almost certainly being the result of previous soil disturbance from works associated with buildings (now demolished) in the area shown in Figure 21. Test pit 12 showed silt topsoil over a sandy silt layer directly over Hinuera formation material which was encountered at 120cm (bs), respectively. Test pits 13 and 14 contained 20cm thick silt topsoil over greyish white sand fill which overlay the Hinuera formation at 70cm (bs) and 130cm (bs), respectively. A sand layer associated with an old land drain was also encountered in test pit 14 at 1.6m (bs) (Aurecon 2020). In general, the test pits show that there has been a high degree of ground disturbance in the past.

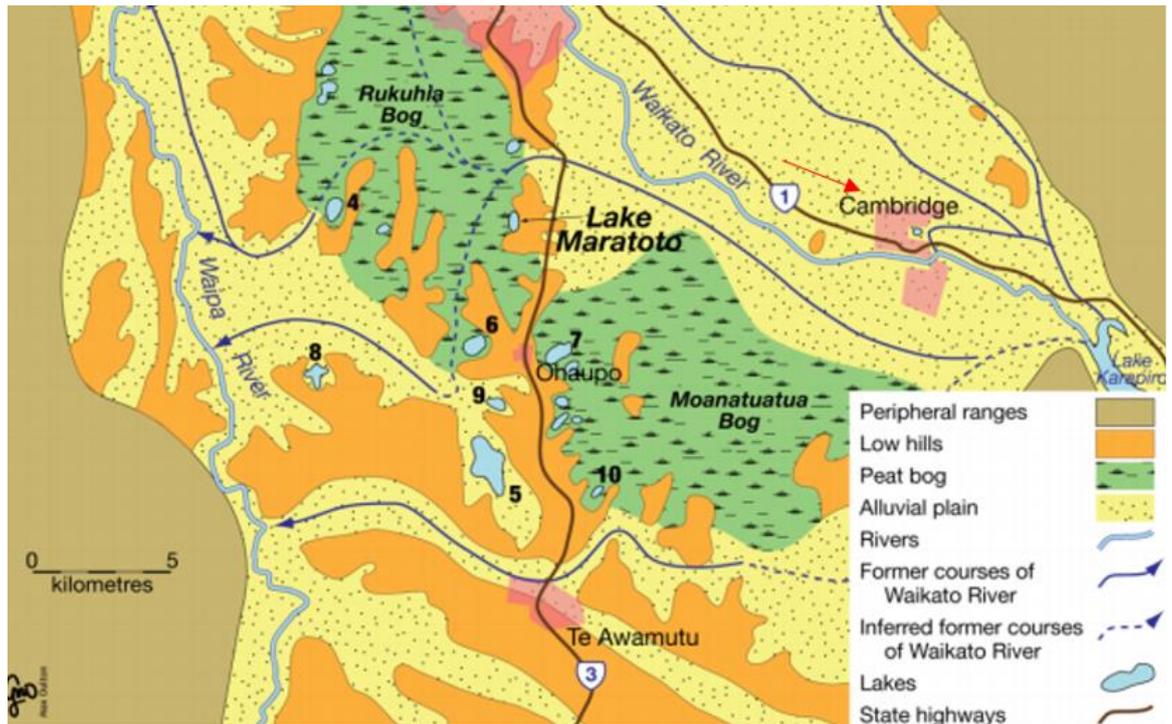


Figure 20. Map showing the modern landscape features in the central and southern part of the Hamilton Basin with approximate location of Growth Cell C4 shown by arrow (source: Lowe 2010)

Topography, Vegetation and Past Land use

The proposed WWTF site is situated on flat ground with elevations from 60-62m asl with a gentle sloping upwards towards the east. The WWTF was part of a dairy farm from the 1880s and, as described above, would have had impacts from installation of farm drains. It was subdivided and sold in 1969 and, as can be seen in the aerial photographs in Figure 21, almost all parts of the main property had buildings or works impacting the ground which took place between 1971 and 1995. A review of aerial photographs to the east of the proposed WWTF, where tanks and a pipeline connection in Lot 3 DPS 13529 are proposed, shows past usage for farming, including crop cultivation (Figure 22). The land for the remainder of the proposed pipeline to connect the WWTF to the existing wastewater storage facility can be seen to cross over the railway reserve into a relatively undeveloped area in the aerial photographs in Figure 22. However, the more recent aerial photograph in Figure 2 shows that the alignment will run along a paved roadway adjacent to the Fonterra factory and existing wastewater storage area.

The aerial photograph in Figure 23 shows ground disturbance from excavation works for the southernmost section of the riverline pipeline. As can be seen this runs through two areas where borrow pits have been recorded at S15/501 and S15/503. It is noted that the area containing S15/501 has been used for crop cultivation and the construction of an access track, which has obscured any surface evidence of the recorded borrow pits.

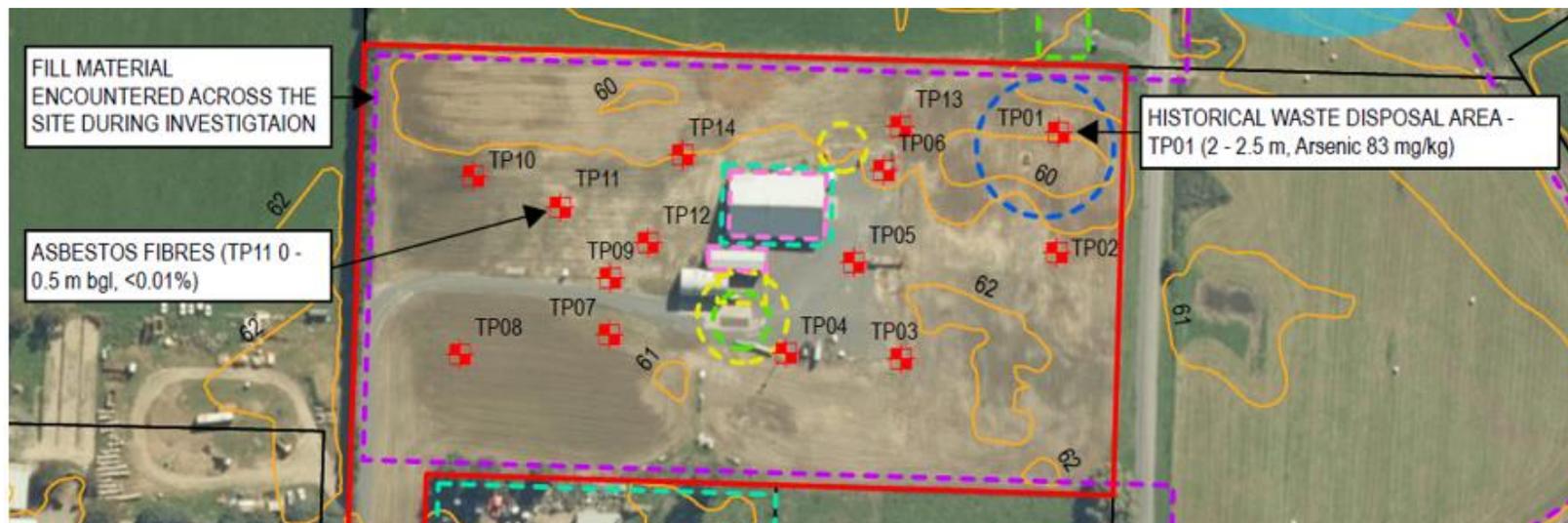


Figure 21. Upper -Aerial plan showing the locations of geotechnical test pits in the proposed WWTF site (source: PDP Ltd) and lower Aerial photographs showing the past impacts on the proposed WWTF site: from left to right, 1971 (Crown 3470 4512 21), 1979 (Crown 5479 H 27) and 1995 (Crown 9401 E7) (sourced from: <http://retrolens.nz> and licensed by LINZ CC-BY 3.0)

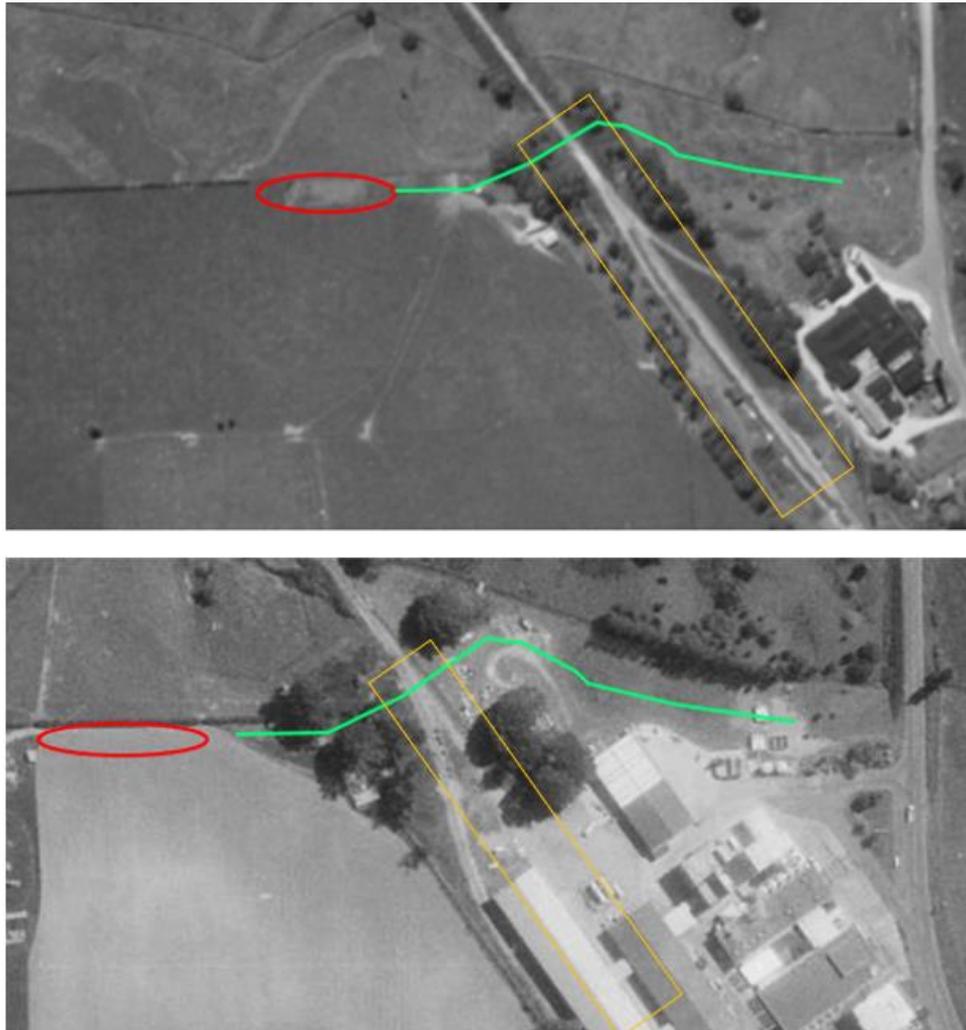


Figure 22. Aerial photographs from 1939 Crown 107 K 9 (upper) and 1979 Crown 5479 H 27 (lower) showing the proposed calamity and balance tanks location (red circle), new alignment to existing wastewater silo indicated by green line and approximate boundary of railway reserve indicated by orange box (sourced from: <http://retrolens.nz> and licensed by LINZ CC-BY 3.0)



Figure 23. Aerial photograph dated 2016 showing works from installation of the riverline pipeline trench in the southern part of the alignment with general location of borrow pits identified by black circles at recorded archaeological sites S15/501 and S15/503 (source: Google maps)

FIELD ASSESSMENT

Field Survey Results

A site walkover and visual inspection of the proposed WWTF property and the southern end of the riverline pipeline and outfall were undertaken on 19 February 2021. Subsurface testing was not undertaken as part of the survey. With respect to the proposed WWTF property, the geotechnical survey at the site provides adequate information on the subsurface environment for this assessment and confirms that there has been a high degree of disturbance from past agricultural and industrial activities. The remainder of the proposed works associated with this project are upgrading of an existing pipeline with the area of direct impacts limited to an expected works area covering a c.1m extension along the existing pipeline trench, apart from the outfall pipe at the southern end which is for the most part above ground and the diffuser structure which is in the river itself. Due to the previous impacts from the existing pipe installation, the limited area where the alignment will directly impact recorded archaeological sites, previous archaeological monitoring with negative results at S15/68 and the archaeological mapping of features associated with Maori horticulture in areas where recorded sites will be affected, the existing information is considered sufficient for purposes of this assessment.

The southernmost part of the alignment and the outfall were visited first. The pipeline in this area is located on a flat river terrace containing grassed paddocks with banks leading down to the Waikato River in the south and a hillside leading up to the north. Nine borrow pits had been previously identified in this area. The pipeline alignment was not visible on the surface apart from a manhole (Figure 24), which was inspected. A single borrow pit (part of site S15/503) was located c.20m to the southeast of the manhole (Figure 24). As can be seen in Figure 19 it would seem likely that the proposed upgrade will affect a line of borrow pits identified at this site. Much of the ground surface in this area could not be inspected as ongoing works for the Cycle River Ride path were obscuring the ground surface.

The hillside containing the outfall pipe was also inspected. The hillside contained a number of mature trees and also had large areas of exposed soil and evidence of erosion was observed (Figure 25, Figure 26). The pipeline itself is supported by a metal frame with footings drilled into the soil. The section of pipeline at the bottom of the hillside is located under the ground surface entering directly into the river where the diffuser structure is located (Figure 26, right). No archaeological features or deposits were observed in this area.

The general area containing the riverline pipeline to the south of Cambridge Road was observed for the most part to be in areas that have had previous modifications from farming or road construction. As well, the alignment between Cambridge Road and the proposed WWTF is situated completely in road reserves and no evidence of borrow pit features were able to be observed.

The proposed WWTF site was visited next. The entrance to the property is located on Hautapu Road and a gravelled driveway is situated on a narrow strip of land leading north to where the main part of the property (and the proposed WWTF site) is located. The area was observed to be a rectangular shaped lot containing a large storage shed and several smaller outbuildings (Figure 27). A telecommunications mast that will remain in its current location was also noted (Figure 27, right). The ground surface around the buildings was

covered by gravel or concrete. The remaining land had been ploughed and the land had been levelled out with fill (Figure 27, Figure 28). Most of this land had been planted in grass which was quite sparse over most of the property. No archaeological features or deposits were observed during the site visit. The area containing the proposed calamity/balance tanks and pipeline connection to the existing wastewater facility contained a grass paddock at the time of the survey and no evidence of archaeological deposits or features was identified.

The area of the proposed calamity tanks and new pipeline was not visited as part of the survey, as modification to the area from agricultural uses and the construction of the road have obscured the ground surface. As the proposed alignment runs across the railway reserve it is considered possible that subsurface archaeological remains associated with the use of the railway.



Figure 24. Left photograph showing the existing pipe in manhole that was inspected; and right photograph with borrow pit (S15/503) identified during the site visit indicated by arrow and stockpile associated with works for the Cycle River Ride project visible in the background, looking east



Figure 25. Photograph showing the riverline outfall pipe, looking north and detail of the slope containing the existing outfall pipe looking northeast



Figure 26. Left photograph showing the base of the outfall pipe where it joins up to the diffuser, looking northeast and right photograph showing the diffuser structure in the river, looking south



Figure 27. Left photograph showing the remaining structures at the proposed WWTF location, looking east; and right photograph showing levelled area planted in grass with telecom mast indicated by arrow, looking southwest



Figure 28. Left photograph showing general view of the northern part of the proposed WWTF site looking north; and right photograph showing general view of the southern part of the WWTF site looking east

DISCUSSION AND CONCLUSIONS

Summary of Results

Six archaeological sites will be directly affected by the proposed development (specifically, by the upgrading of the riverline pipeline). Five of these sites (S15/501, S15/502, S15/503, S15/668 and S15/710) are associated with Maori horticulture and have been recorded as borrow pits, with associated garden soils. The sixth is a pa site (S15/68) and the proposed riverline pipeline passes through the recorded extent of the site in an area where gardening soils have been recorded. No evidence of archaeological deposits or features was identified in the outfall section of the riverline pipeline.

No archaeological sites have been recorded at the proposed WWTF site or in the area proposed for installation of the calamity and balance tanks and pipeline to connect the WWTF to the existing wastewater storage facility and no archaeological deposits or features were identified during the survey for this assessment. It is noted that the pipeline also passes through the old railway reserve, but not through the estimated location of the recorded archaeological site – Hautapu Station (S15/769). Based on the findings of this assessment, it is considered likely that if any archaeological features or deposits have survived at the proposed WWTF Site and the surrounding area, they would only be present at deeper levels, as past impacts would have obscured any surface evidence.

If any archaeological remains have survived in the sections of the riverline pipeline in the road reserves, these again would be expected to have been damaged by past impacts.

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.

The historical association of the general area with the tangata whenua is evident from the recorded sites, traditional histories and known Maori place names.

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.

No subsurface testing was carried out as it was considered that sufficient information was available from the geotechnical testing at the WWTF site, previous archaeological monitoring results and the previous mapping of archaeological features and soils associated with Maori horticulture.

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 2019: 9-10). Both sets of criteria have been used to assess the value and significance of archaeological sites S15/501, S15/502, S15/503, S15/668 and S15/710, which have been evaluated collectively in as they are all borrow pit sites in Table 3 and Table 4. S15/68, the pa site has been evaluated separately, with results in Table 5 and Table 6.

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.

It should be noted that the borrow pit sites were originally recorded from a review of aerial photographs and classified as borrow pits as this was the feature most easily identified remotely. Previous investigations have shown that these sites usually also contain gardening soils and additional archaeological features, such as, storage pits, fireplaces and charcoal deposits. As such they have been evaluated not as a single feature (borrow pits) but as Maori horticultural sites recorded as borrow pits. Overall, these sites are considered to have moderate archaeological value based on the criteria discussed, relating to information potential as investigation of these sites can increase the existing knowledge of Maori horticultural processes in the local area and how this relates to similar sites in the broader region. As well, material suitable for radiocarbon dating is often present at these sites and can be used to provide information on how Maori settlement patterns developed over time in the Waikato, a subject which is not clearly understood at present. Overall, the pa (S15/68) is considered to have moderate value based on the site type, degree of preservation and information potential.

Table 3. Assessment of the archaeological values of sites S15/501, S15/502, S15/503, S15/668 and S15/710 (Maori horticultural sites/ recorded as borrow pits) based on Heritage NZ criteria (Heritage NZ 2019: 9-10)

Value	Assessment
Condition	The landscape in the area containing the sites has undergone varying degrees of modification through farming practices, industrial uses, construction of cycleways and of the existing riverline pipeline. However, it is considered likely that even where past impacts have damaged the upper layers, deeper archaeological features may have survived.
Rarity	The sites are not rare as Maori horticultural sites containing borrow pits are a very common site type in the area.
Contextual value	The borrow pits are associated with an archaeological landscape of Maori settlement and horticulture in the local and regional area.

Value	Assessment
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 information to the site type. However, the recording of information on Maori horticultural features such as borrow pits and associated gardening soils does have potential provide information that will increase our understanding of variation and innovation of Maori horticultural practices both temporally and geographically. As well, these sites have the potential to contain material suitable for radiocarbon dating, which could add to the understanding of these processes and also for establishment of the earliest dates for gardening sites in the Waikato.
Amenity value	The borrow pits are for the most part situated on private land, although the construction of a cycleway along the Waikato River will provide public access and increase the amenity value of sites in its vicinity. However, the sites have little visual amenity value as they are largely subsurface and if borrow pits are visible on the ground surface they are not obvious archaeological features.
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 4. Assessment of the heritage significance of sites S15/501, S15/502, S15/503, S15/668 and S15/710 (borrow pits) based on the Waikato Regional Policy Statement (Section 10A Table 10.1)

Archaeological Qualities	
Information	The sites have moderate potential to provide information on horticultural practices (gardening processes) in the local area and how this relates to the regional archaeological landscape of pre-European Maori occupation in the Waikato. The sites also have 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.
Research	It has been noted that the distribution of pre-European Maori horticultural sites in the Cambridge / Leamington area differs from other parts of the Waikato and that investigation of these sites can provide insights into both local settlement patterns and broader settlement patterns in the Waikato region.
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.
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 largely subsurface. The construction of a cycleway along the Waikato River will make the sites more accessible to the public and increase the amenity value of sites in its vicinity.
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, but are generally associated with Maori settlement in the area.

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 (apart from Maori horticulture, which is addressed under the first heading).
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 data gathered from archaeological investigation can provide information to increase the understanding of Maori gardening processes.

Table 5. Assessment of the archaeological values of site S15/68 (pa) based on Heritage NZ criteria (Heritage NZ 2019: 9-10)

Value	Assessment
Condition	The site has been impacted by developments in the past, although subsurface evidence of the site is considered likely to have survived.
Rarity	There are a number of pa sites in the area. It is not a particularly 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, which includes several pa and numerous sites relating to Maori horticulture.
Information potential	Radiocarbon dates have been obtained from this site during past investigations. Any subsurface remains still present would be able to provide additional information on settlement activities in the Cambridge area.
Amenity value	Currently limited as the surface features of the site have been largely obscured by previous development. The site is located in an area easily accessible to the public and signage could be used to provide information to the public about the site.
Cultural associations	The site has Maori cultural association. Its cultural significance is for tangata whenua to determine.
Other	No other values were identified.

Table 6. Assessment of the heritage significance of site S15/68 (pa) based on the Waikato Regional Policy Statement (Section 10A Table 10.1)

Archaeological Qualities	
Information	Radiocarbon dates have been obtained from this site during past investigations. Any subsurface remains still present would be able to provide additional information on settlement activities in the Cambridge area.
Research	Parts of the site have already been investigated. Additional information recovered from the site would contribute to research into the settlement activities in the local and wider 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.
Cultural Qualities	
Sentiment	The site is not currently important as a focus of spiritual, political, national or other cultural sentiment. Its 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 does not provide evidence of cultural or historical continuity.
Amenity or Education	Currently limited as the surface features of the site have been largely obscured by previous development. The site is located in an area easily accessible to the public and signage could be used to provide information to the public about the site.
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, but is generally associated with Maori settlement in the area.
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.

Effects of the Proposal

Proposed WWTF and Associated Infrastructure

No archaeological sites have been previously recorded in the proposed WWTF property (Lot 1 DPS 13529) or in the neighbouring property (Lot 3 DPS 13529) proposed for the installation of calamity and balance tanks and a new pipeline to connect the proposed WWTF to the existing wastewater storage facility. Past impacts from farming and industrial activities have obscured surface evidence and would have damaged or destroyed any archaeological remains in the upper levels of the soil. Although, the research and survey for this assessment has not identified any archaeological sites in this area, the fact that these properties lie approximately 70m to the south of the Mangaone Stream and a reported historical trackway means the possibility of archaeological remains being present at deeper levels cannot be completely discounted. It is also noted that the proposed pipeline connecting the calamity and balance tanks to the existing wastewater storage facility also passes through the northern end of the old railway reserve and it is considered possible that subsurface archaeological remains associated with the railway may be present. The conceptual plans for the WWTF site are shown in Figure 29.

Riverline Pipeline in Road Reserves

It is considered unlikely that archaeological remains will have survived in the sections of alignment in road reserves due to impacts from previous road construction and utility installation, including the existing riverline pipeline. Previous investigations have supported this with no archaeological remains identified at either S15/606 or S15/711 during monitoring for road works.

Riverline Pipeline Upgrade (Not in Road Reserves)

The existing riverline pipeline south of the section in road reserves runs through a Maori horticultural landscape. As noted previously, the section of the pipeline to the south of Cambridge Road passes through the extent of pa site S15/68 in an area where gardening soils have been recorded. As this alignment was monitored when it was originally installed in 2012 and no archaeological features or deposits were identified, it is considered unlikely that the upgrade will impact on archaeological remains.

The existing alignment also passes through borrow pits and gardening soils that have been recorded remotely or identified in previous surveys at sites S15/501, S15/502, S15/503, S15/668 and S15/710. It should be noted that the upgrade works are limited in nature and will only consist of extension of an existing trenches with the impacted area being a maximum of 1m in width. The maximum depth of the excavation will be c.1.2m. Based on the findings of this assessment, it is considered likely that archaeological features in the form of gardening soils and borrow pits will be encountered during the upgrade works in the section of the alignment to the south of pa site S15/68 (shown by the blue line in Figure 30). It is, however, important to note that because of the limited nature of the works for the pipeline upgrade, the damage to the sites will be minimal and the majority of the deposits and features will not be affected.

Outfall Pipe and Diffuser Upgrade

The outfall pipe will extend from a manhole at the edge of the riverbank and run down the bank, and excavation will be required to install the pipe as can be seen in Figure 31. These works are not expected to affect any archaeological remains as the inspection of the hillside showed ongoing signs of erosion and no archaeological remains were identified. The pipe

will then join to a metal support structure located from the edge of the river. The support will extend into the river and will be anchored into the riverbed to join with the replacement diffuser. These latter works will be undertaken from a barge in the river and minimal impact to the ground surface in the vicinity is expected.

Silt control measures are proposed as shown in Figure 32. The works will include a clean drain diversion (no excavation required) and sheet piling for dewatering along the edge of the river (in an area where archaeological remains are not considered likely to be present). As the works will include the area containing archaeological site S15/503, it is recommended that the extents of any identifiable borrow pits are marked out by temporary fencing during the works to protect them from the damage by machinery and equipment.

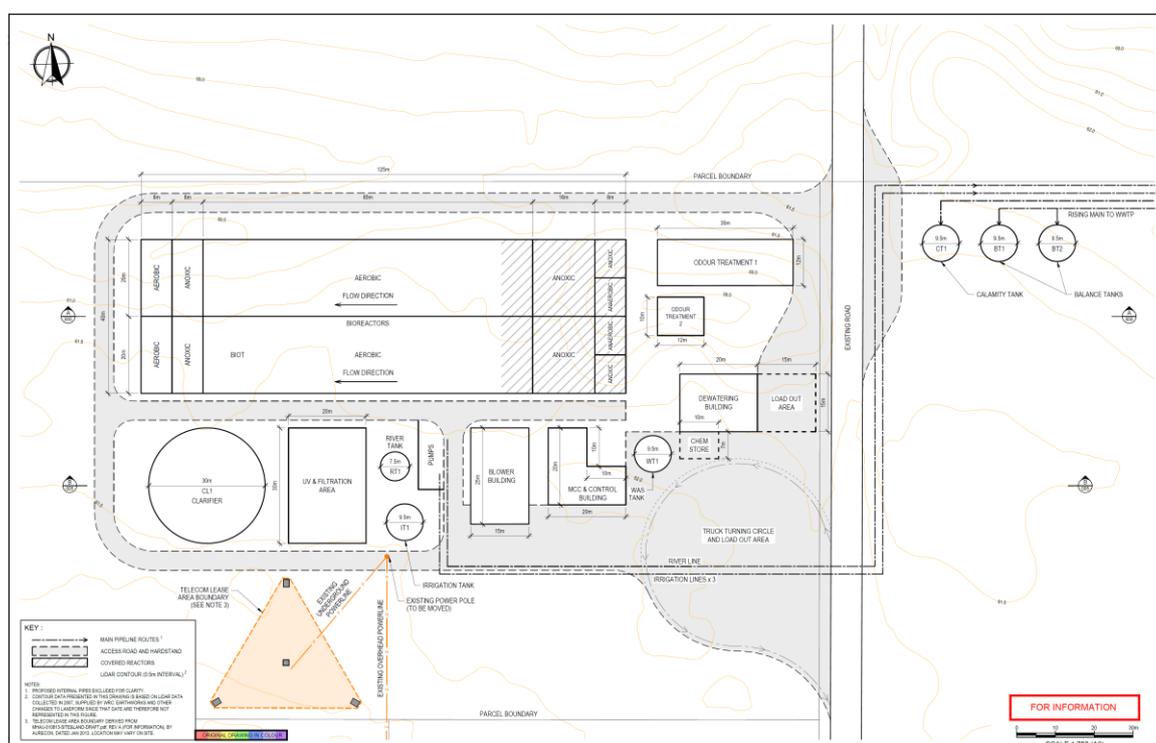


Figure 29. Plan showing the conceptual layout of the proposed WWTF and Calamity and Balance Tanks (source: PDP)

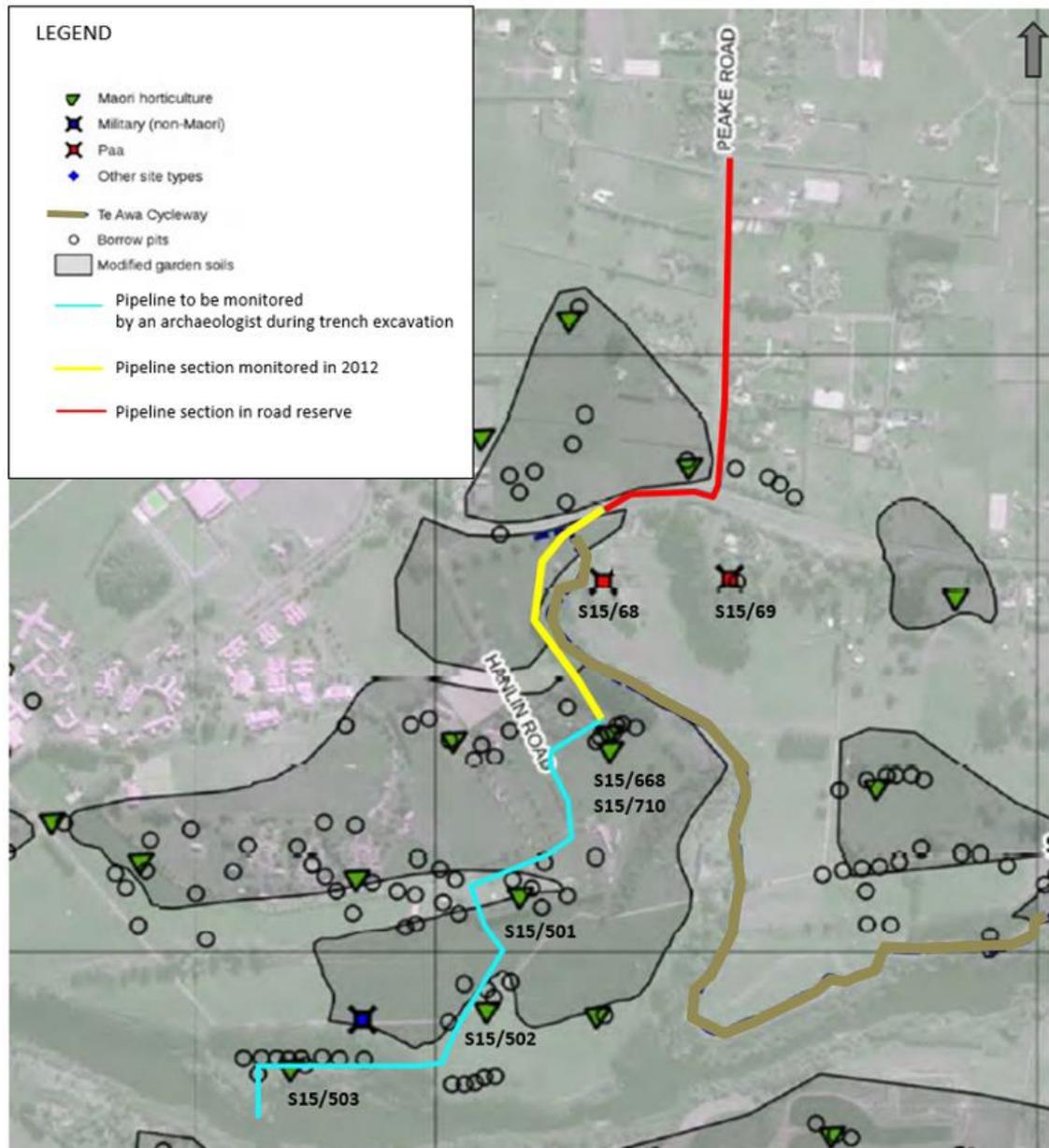


Figure 30. Aerial plan showing the location of archaeological sites with features directly affected by the proposed works and section of the upgrade alignment that should be monitored by an archaeologist outlined in blue (source: Gumbley and Hutchinson 2013)

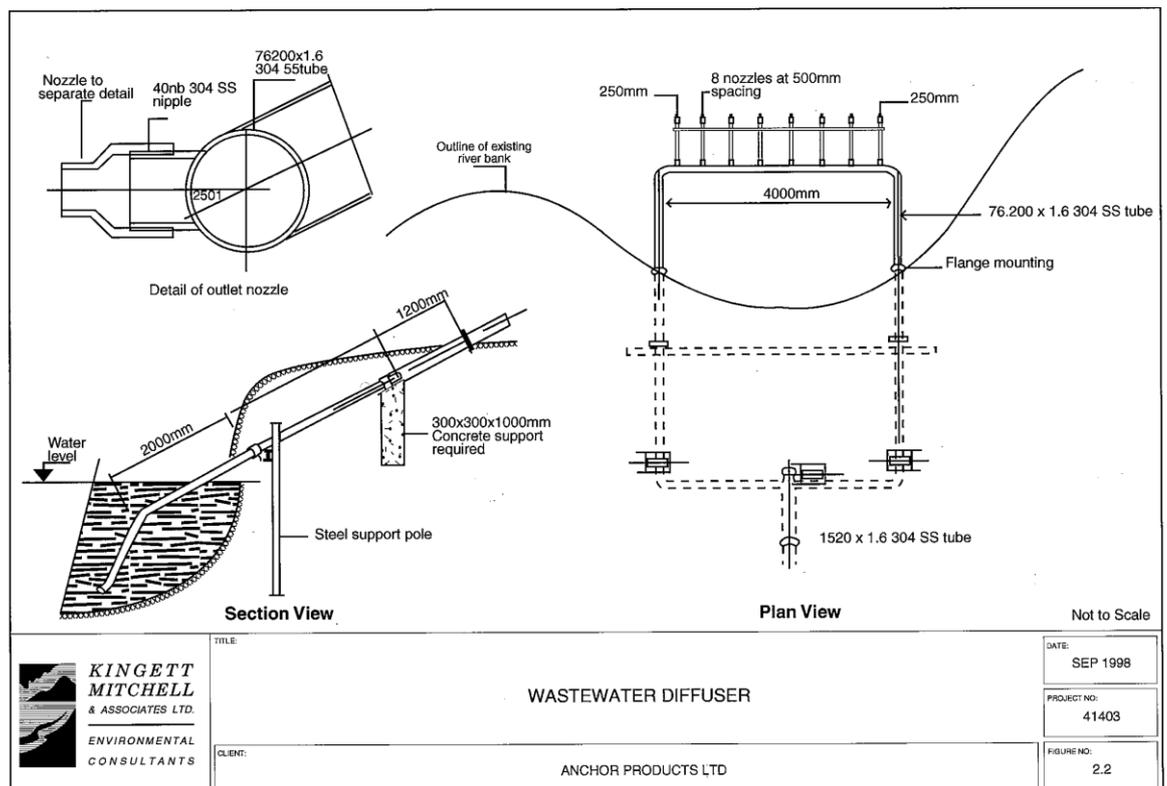
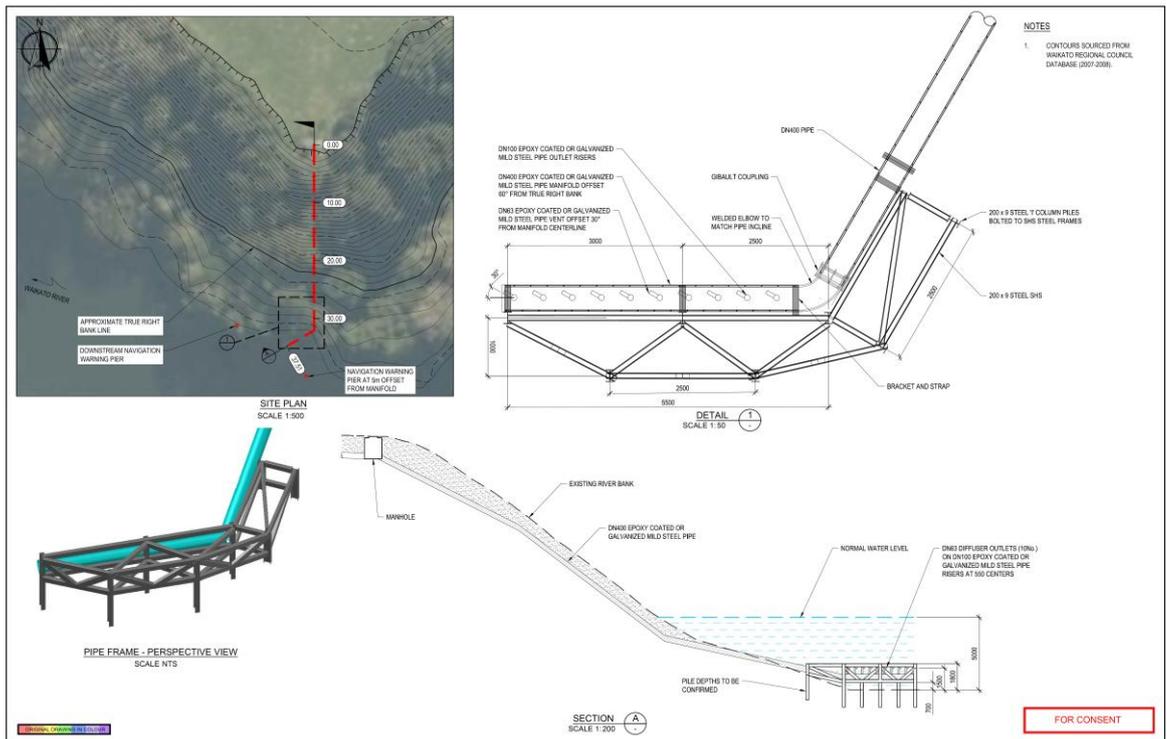


Figure 31. Upper plan showing the proposed outfall and lower plan showing the proposed replacement diffuser (source: upper – PDP and lower – Kingett Mitchell)

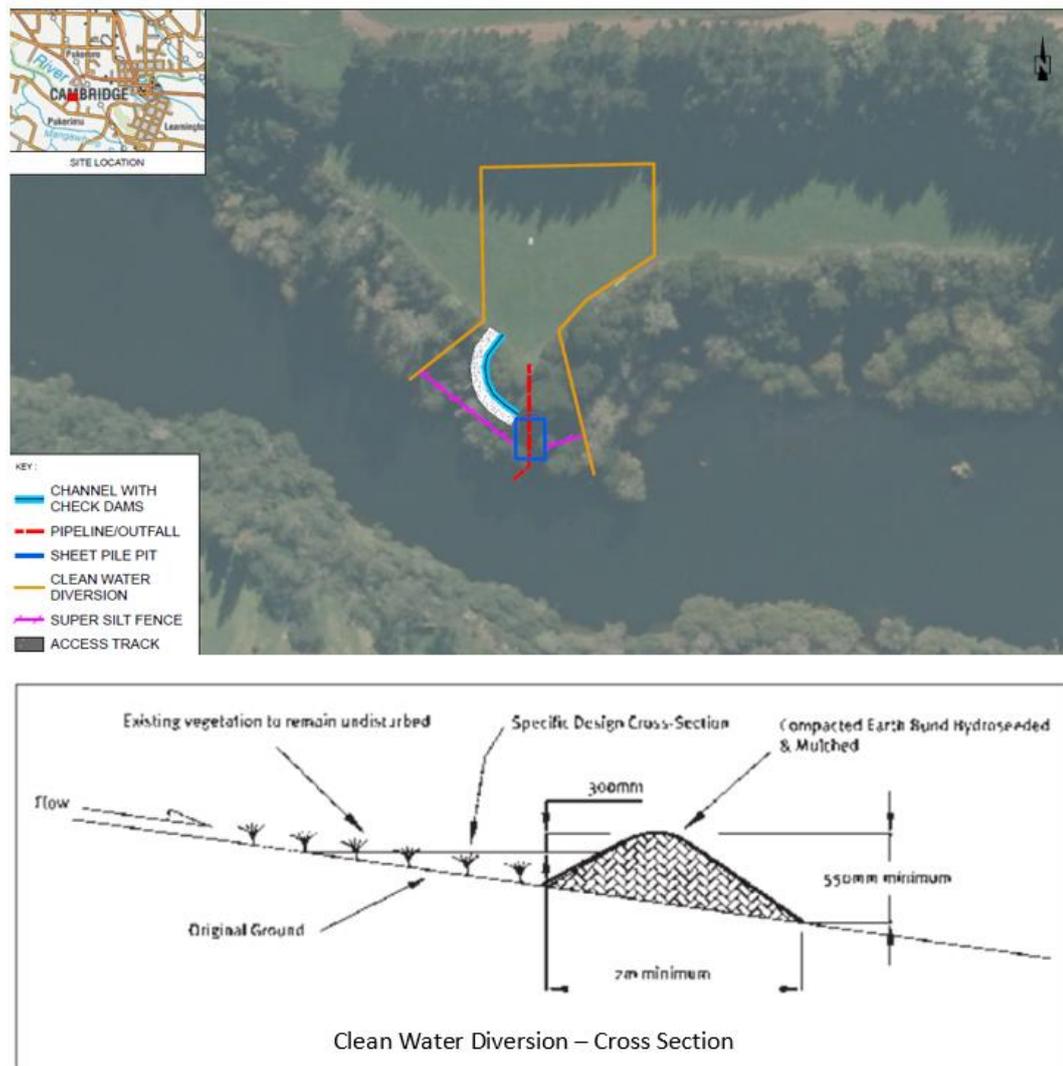


Figure 32. Erosion and sediment control plan (upper) and cross section of the clean water diversion (lower) at the outfall location (source: PDP)

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.

The Pa site (S15/68) is included in Appendix N of the Waipa District Plan. It should also be noted that the sites listed were compiled in 2009 from an upgrade to the New Zealand Archaeological Association Database and reflect the sites identified in the district at that time. However, all archaeological sites recorded on the NZAA database before and after 2009 and all other as of yet unrecorded archaeological sites are protected under the Heritage New Zealand Pouhere Taonga Act 2014 and cannot be modified or destroyed unless an authority has been obtained from Heritage New Zealand.

This assessment has established that the proposed works have the potential to affect six recorded archaeological sites. If resource consent is granted it is recommended that archaeological monitoring of the trench excavation for the upgrade of the riverline pipeline as shown in Figure 30 is undertaken to confirm if borrow pits, gardening soils and/or any other archaeological features are present.

As well, it is recommended that an advice note regarding the provisions of the HNZPTA is included, as an Authority under that Act will be required for any modification and investigation of archaeological remains relating to S15/68, S15/501, S15/502, S15/503, S15/668 and S15/710.

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)¹, –

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

(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)²

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.

As the current plans for the proposed upgrading of the riverline pipeline will affect sites S15/68, S15/501, S15/502, S15/503, S15/668 and S15/710, an Authority must be obtained from Heritage NZ before any work can be carried out that may affect the sites. The conditions of the authority are likely to include the archaeological recording/investigation of any remains affected. It is recommended that works for all of the development works (WWTF, Calamity and Balance Tanks, New Pipeline between the WWTF and existing wastewater storage facilities, Riverline Pipeline and Outfall) are included in the Authority application. This would ensure that if additional unrecorded subsurface remains were exposed in other areas during development, delays would be minimised as appropriate archaeological management procedures would be in place.

¹ Under Section 42(3) an Authority is not required to permit work on a pre-1900 building unless the building is to be demolished.

² 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.

Conclusions

The proposed development works will impact on six recorded archaeological sites: S15/68 (pa site) and S15/501, S15/502, S15/503, S15/668 and S15/710 (Maori horticultural sites – borrow pits and gardening soils). Based on the location of the existing pipeline and the extensive nature of the affected sites, it will not be possible to avoid the archaeological sites completely. It is, however, noted that the works in this area are limited to a narrow trench (maximum width 1m) alongside an existing pipeline trench and that only minor modification of archaeological sites would occur. However, any works that are likely to result in modification of an archaeological site require an archaeological Authority under the HNZPTA, which must be granted prior to the start of works.

Overall, it is considered that any adverse effects on archaeology resulting from the proposed development are likely to be minor, due to the limited nature of the works which affect only a small part of the archaeological sites that are directly affected. It is also considered that if additional subsurface archaeological remains are identified during the works, they are unlikely to be extensive or of high significance, based on past impacts from road construction, agricultural and industrial activities and other developments. The adverse effects on archaeology could be appropriately mitigated through the recovery of archaeological information, especially through recovery of material suitable for radiocarbon dating to provide data relating to the chronology of Maori settlement in the inland Waikato region. This will require an Authority under the HNZPTA.

RECOMMENDATIONS

- As archaeological deposits and possibly features within sites S15/68, S15/501, S15/502, S15/503, S15/668 and S15/710 will be modified by the proposed development an Authority must be applied for under Section 44(a) of the HNZPTA and granted by Heritage NZ prior to the start of any earthworks.
- Because it is possible that additional unrecorded sites may be exposed during earthworks, the Authority application should include any additional sites that may be discovered when works are under way.
- Archaeological monitoring should be carried out during the trench excavation for the upgrading of the riverline pipeline as shown by the blue line in Figure 30, and any archaeological remains exposed should be investigated and recorded.
- The extent of any identifiable borrow pits at S15/503 near the proposed outfall should be marked out by temporary fencing during the works to protect them from damage by machinery and equipment.
- Spot checks on the remaining works areas should be carried out to identify if any archaeological remains are present.
- In the event of koiwi tangata (human remains) being uncovered, work should cease immediately in the vicinity of the remains and tangata whenua, Heritage NZ, the NZ Police and Council should be contacted so that appropriate arrangements can be made.
- As the affected archaeological sites relate to Maori settlement, the tangata whenua should be consulted regarding the cultural effects of the proposal (this will be required as part of the Authority application).

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Old Newspaper Articles accessed at <https://paperspast.natlib.govt.nz/newspapers>

Waikato Independent 3 May 1919

Waikato Independent 24 August 1922

APPENDIX A: SITE RECORD FORMS

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/68</p> <p>SITE TYPE: Pa</p> <p>SITE NAME(s):</p> <p>DATE RECORDED:</p>
<p>SITE COORDINATES (NZTM) Easting: 1814279 Northing: 5803623 Source: On Screen</p>	
<p>IMPERIAL SITE NUMBER: N65/124 METRIC SITE NUMBER: S15/68</p>	
	
<p>Finding aids to the location of the site Cambridge. 40m south of SH1, and 150m east of Peake Road, on edge of gully and beneath power lines.</p>	
<p>Brief description Pa with associated made soils. Promontory cut off by at least 2 defensive ditches.</p>	
<p>Recorded features Soil - made, Ditch - defensive</p>	
<p>Other sites associated with this site S15/69, S15/711, S15/607, S15/42, S15/669, S15/668, S15/709</p>	

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: S15/68
<p>Site description</p> <p>Updated 05/07/2016 (Field visit), submitted by danielletrilford , visited 08/03/2016 by Trilford, Danielle Grid reference (E1814279 / N5803623)</p> <p>Pa with associated gardening soils on the north and north west. Earthworks for the foundation maintenance of the transmission towers involved each foundation excavated with a 3.5 m x 3.5 m square, or 2.2 x 2.2 m square, to expose the legs and then reinstated with cement. Post holes and a isolated area of fire scoops were exposed (attached image 6255). See report:</p> <p>Trilford, D. 2016. Transpower OTA–WKM A Tower 0190, B Tower 0179 and C Tower 0180: archaeological investigation of site S15/68 (HNZPTA authority 2016/649). Final Report for Transpower, Unpublished CFG Heritage Report for HNZ.</p> <p>Updated 12/08/2014 (Field visit), submitted by warrengumbley, visited 04/02/2014 by Gumbley, Warren; Hutchinson, Malcolm Grid reference (E1814279 / N5803623)</p> <p>Pa with associated made soils. 1943 aerial photos show pa located on a point defended by two ditches. Report on recent investigations Te Awa Cycleway - Cambridge to velodrome: S15/68, S15/669, S15/676, S15/680 by W Gumbley and Malcolm Hutchinson. Main part of the pa (area south of the power pylons) has been affected by the development of a BMX-type track that has been laid on the surface of the ground. This should have left the underlying archaeology un-affected but maintenance or modification of this track may lead to incremental damage. Updated by Warren Gumbley 12 August 2014.</p> <p>Updated: 18/07/2012 - NZTM E1814279 / N5803623 (On Screen). Ortho +/-0m - coordinates from rectified aerial orthophoto. Location clear on Waikato Regional Council (Environment Waikato) Aerial Photographs 2002. Pasture, trees, cultivated, damaged by line installation. Updated by: Coster, John (NZAA Upgrade Project, 2008-2009).</p> <p>Condition of the site</p> <p>Updated 05/07/2016 (Field visit), submitted by danielletrilford , visited 08/03/2016 by Trilford, Danielle</p> <p>Same as previous, however further damage has occurred as a result of the foundation works of the 2016 Transpower transmission tower maintenance.</p> <p>Updated 12/08/2014 (Field visit), submitted by warrengumbley, visited 04/02/2014 by Gumbley, Warren; Hutchinson, Malcolm</p> <p>Damaged but most of the subsurface damage is confined to the area outside the defences. The Te Awa cycleway concrete track has affected subsurface archaeology inside the paa proper.</p> <p>Statement of condition</p> <p>Updated: 23/09/2015, Visited: 04/02/2014 - Fair - Some intact features, but others may be unclear or damaged</p> <p>Current land use:</p> <p>Updated: 05/05/2017, Visited: 08/03/2016 - Reserve/ recreation, Services Updated: 23/09/2015, Visited: 04/02/2014 - Reserve/ recreation</p> <p>Threats:</p> <p>Updated: 05/05/2017, Visited: 08/03/2016 - Road/ track formation or maintenance, Property development, Fossicking, Services/ utilities, Visitor impacts/ vandalism Updated: 23/09/2015, Visited: 04/02/2014 - Road/ track formation or maintenance, Property development, Services/ utilities</p>	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY	NZAA SITE NUMBER: S15/68
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Supporting documentation held in ArchSite

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM (NZMS1)		NZAA NZMS 1 SITE NUMBER N65/124
NZMS 1 map number N65 NZMS 1 map name Hamilton NZMS 1 map edition 4th. 1974		DATE VISITED SITE TYPE Pa SITE NAME: MAORI OTHER
Grid Reference Easting <input type="text" value="2"/> <input type="text" value="9"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/>		Northing <input type="text" value="5"/> <input type="text" value="3"/> <input type="text" value="4"/> <input type="text" value="0"/> <input type="text" value="0"/>
1. Aids to relocation of site (<i>attach a sketch map</i>) Between State Highway 1 (Hamilton-Cambridge) and the Waikato River, some 400m south-east of the junction of Hanlin Road with State Highway 1.		
2. State of site and possible future damage To be ascertained.		
3. Description of site (<i>Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here</i>) Pa referred to in Pip Vennell's book "Such Things Were" (see map at back) relocated using aerial photographs. Ground inspection to follow presently.		
4. Owner Address To be ascertained.		Tenant/Manager Address
5. Nature of information (<i>hearsay, brief or extended visit, etc.</i>) "Such Things Were" & aerial photos. Photographs (<i>reference numbers, and where they are held</i>) Encl. Aerial photographs (<i>reference numbers, and clarity of site</i>) 835/57 & 58 (1943) shows clearly. S. C. EDSON		
6. Reported by Address S. Edson, Waikato Art Museum, Box 937, Hamilton.		Filekeeper Date WAIKATO ART MUSEUM BOX 937 HAMILTON 24.2.79
7. Key words		
8. New Zealand Register of Archaeological Sites (<i>for office use</i>) NZHPT Site Field Code		
<input type="checkbox"/> A <input checked="" type="checkbox"/> D	Type of site	<input type="checkbox"/> . <input type="checkbox"/> .
<input type="checkbox"/> - <input type="checkbox"/> -	Local environment today.	<input type="checkbox"/> A <input type="checkbox"/> A
<input type="checkbox"/> - <input checked="" type="checkbox"/> -	Land classification	<input type="checkbox"/> H <input type="checkbox"/> U
		Present condition and future danger of destruction
		Security code
		Local body

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

<u>PHOTOGRAPHS AND SLIDES</u>	
SITE NUMBER N65/124	GRID REFERENCE 940364
NZHPT COLLECTION	CENTRAL FILE AR 3215 -3216 (WAM 1980) AR 3286 (WAM enlargement from L-S air photos)

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Photograph of the 3 x half sectioned firescoops found during the earthworks on the NE portion of the northern most transmission tower.



NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/501</p> <p>SITE TYPE: Maori horticulture</p> <p>SITE NAME(s):</p> <p>DATE RECORDED: 23/03/2012</p>
<p>SITE COORDINATES (NZTM) Easting: 1814146 Northing: 5803101 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 3 borrow pits in an area of 70 x 20 m, visible on aerial photo SN266/835/57.</p>	
<p>Recorded features 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: S15/501
<p>Site description Updated: 23/03/2012 - NZTM E1814146 / N5803101 (On Screen). 3 borrow pits in an area of 70 x 20 m, visible on aerial photo SN266/835/57. 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: S15/501
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Supporting documentation held in ArchSite

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/502</p> <p>SITE TYPE: Maori horticulture</p> <p>SITE NAME(s):</p> <p>DATE RECORDED: 23/03/2012</p>
<p>SITE COORDINATES (NZTM) Easting: 1814091 Northing: 5802907 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 4 borrow pits in an area of 100 x 30 m, visible on aerial photo SN266/835/57.</p>	
<p>Recorded features 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: S15/502
<p>Site description</p> <p>Updated: 23/03/2012 - NZTM E1814091 / N5802907 (On Screen). 4 borrow pits in an area of 100 x 30 m, visible on aerial photo SN266/835/57. 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: S15/502
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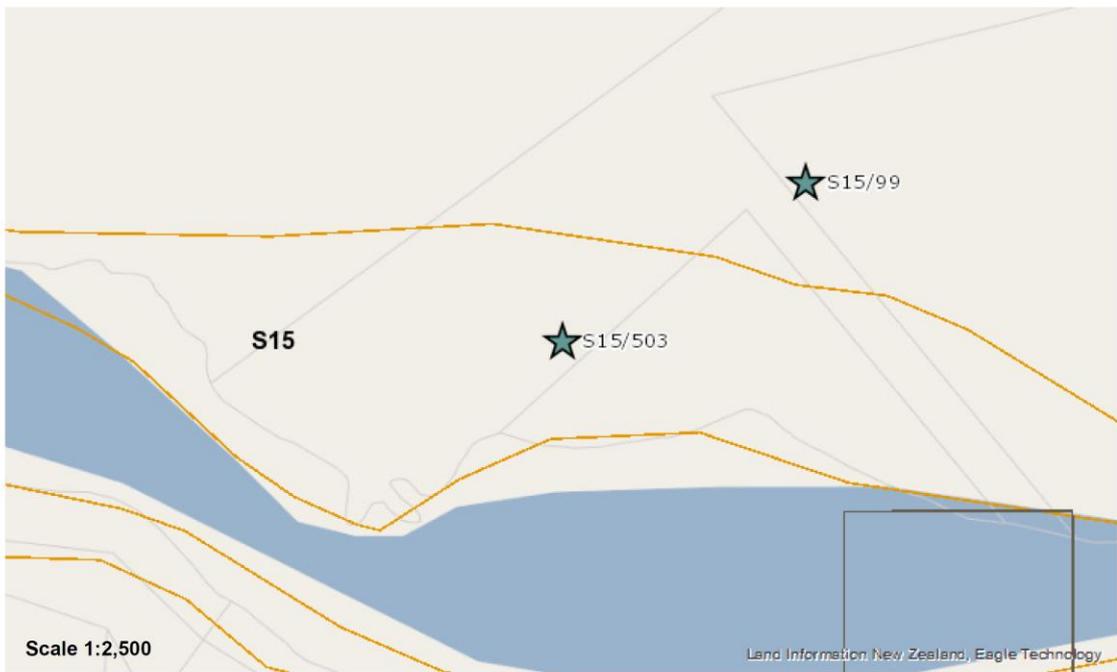
Supporting documentation held in ArchSite

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/503</p> <p>SITE TYPE: Maori horticulture</p> <p>SITE NAME(s):</p> <p>DATE RECORDED: 23/03/2012</p>
<p>SITE COORDINATES (NZTM) Easting: 1813771 Northing: 5802817 Source: Handheld GPS</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>Walk from the end of the Hanlin Road right of way (farm road) west across the paddocks. Will be accessible from from cycleway in the future-from Avantidrome walk down cycleway hill, turn west and walk to site.</p>	
<p>Brief description</p> <p>9 borrow pits in an area of 180 x 30 m, visible on aerial photo SN266/835/57.</p>	
<p>Recorded features</p> <p>Borrow pit</p>	
<p>Other sites associated with this site</p> <p>S15/633, S15/501, S15/504</p>	

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: S15/503
<p>Site description</p> <p>Updated 24/04/2018 (Field visit), submitted by alexysimmons , visited 29/03/2018 by Simmons, Alexy Grid reference (E1813771 / N5802817)</p> <p>Cluster of borrow pits in a paddock adjacent to the Waikato River. The borrow pit location is also Pukerimu Landing (west) and associated with S15/99 (redoubt) and Pukerimu Redoubt across the Waikato River.</p> <p>Updated: 23/03/2012 - NZTM E1813765 / N5802809 (On Screen). 9 borrow pits in an area of 180 x 30 m, visible on aerial photo SN266/835/57. 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 24/04/2018 (Field visit), submitted by alexysimmons , visited 29/03/2018 by Simmons, Alexy</p> <p>Several borrow pits were evident during the brief survey.</p> <p>Statement of condition</p> <p>Updated: 11/07/2018, Visited: 29/03/2018 - Fair - Some intact features, but others may be unclear or damaged</p> <p>Current land use:</p> <p>Updated: 11/07/2018, Visited: 29/03/2018 - Grazing</p> <p>Threats:</p>	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY	NZAA SITE NUMBER: S15/503
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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/668</p> <p>SITE TYPE: Maori horticulture</p> <p>SITE NAME(s):</p> <p>DATE RECORDED: 19/12/2012</p>
<p>SITE COORDINATES (NZTM) Easting: 1814293 Northing: 5803372 Source: Handheld GPS</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 Located next to a track running along the northern extent of the paddock used for equestrian activities at St Peters School.</p>	
<p>Brief description A 10m by 11m borrow pit</p>	
<p>Recorded features Borrow pit</p>	
<p>Other sites associated with this site S15/68</p>	

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: S15/668
<p>Site description</p> <p>Updated: 19/12/2012, Visited: 18/12/2012 - NZTM E1814293 N5803372 (Handheld GPS). A borrow pit was observed in a grassed paddock used for equestrian activities within the grounds of St Peters School. The pit measures 10m EW by 11m NS. A small 300mm x 200mm test pit was placed in the centre of the pit, but base was not reached, and the pit was halted 400mbs.</p> <p>The profile consisted of: Topsoil - modern topsoil, dark brown loam 601mm thick Redeposited subsoil - mid-yellowish brown silty loam 50mm thick Buried topsoil - dark brown loam, 200mm thick Subsoil ? - yellowish brown, 80mm exposed only.</p> <p>Probing suggested an addition 600mm until a compact surface was reached, most likely the natural. Two more slight depressions were located to the east of the pit, although testing suggests these are shallow and may have been formed through farming activities.</p> <p>Inspected by: Phear, Sarah</p> <p>Condition of the site</p> <p>Updated: 19/12/2012, Visited: 18/12/2012 - In good condition</p> <p>Statement of condition</p> <p>Updated: 13/11/2013, Visited: 18/12/2012 - Good – Majority of visible features are intact, but some minor loss of definition and/or damage</p> <p>Current land use:</p> <p>Updated: 13/11/2013, Visited: 18/12/2012 - Grazing, Reserve/ recreation</p> <p>Threats:</p> <p>Updated: 13/11/2013, Visited: 18/12/2012 - Property development</p>	

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD INVENTORY	NZAA SITE NUMBER: S15/668
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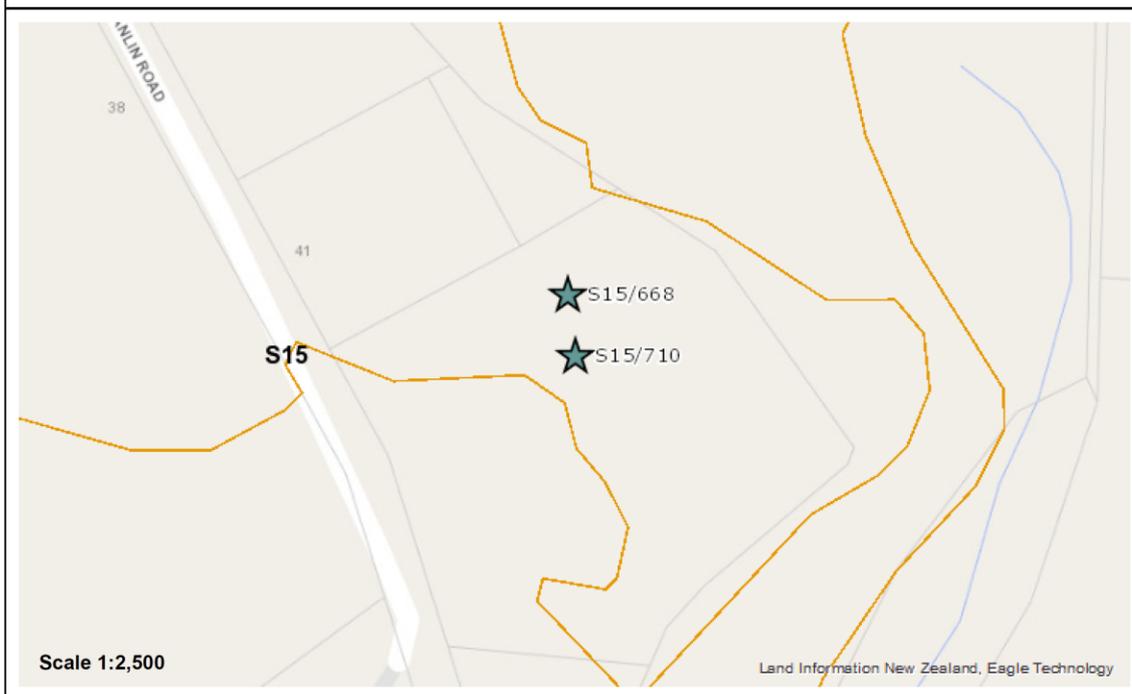
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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

 <p>Site Record Form</p>	<p>NZAA SITE NUMBER: S15/710</p>
	<p>SITE TYPE: Maori horticulture</p> <p>SITE NAME(s):</p> <p>DATE RECORDED: 17/12/2013</p>

SITE COORDINATES (NZTM) Easting: 1814296 **Northing:** 5803345 **Source:** On Screen

IMPERIAL SITE NUMBER: **METRIC SITE NUMBER:**



Finding aids to the location of the site
North of the Waikato river, west of Cambridge

Brief description
7 borrow pits

Recorded features
Borrow pit

Other sites associated with this site

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD HISTORY	NZAA SITE NUMBER: S15/710
<p>Site description Updated: 17/12/2013 - to follow</p> <p>7 borrow pits Part of an extensive horticultural landscape, recorded from aerial imagery. No further site detail available. Information is less than sufficient, but considered more important that evidence of this large cultural landscape remained in ArchSite. For context refer Gumbley, W. and M Hutchinson. 2013. Pre-European Maori Garden Sites in Waipa District: An assessment of the state of the resource M. O’Keeffe, Central Filekeeper, August 2020</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: S15/710
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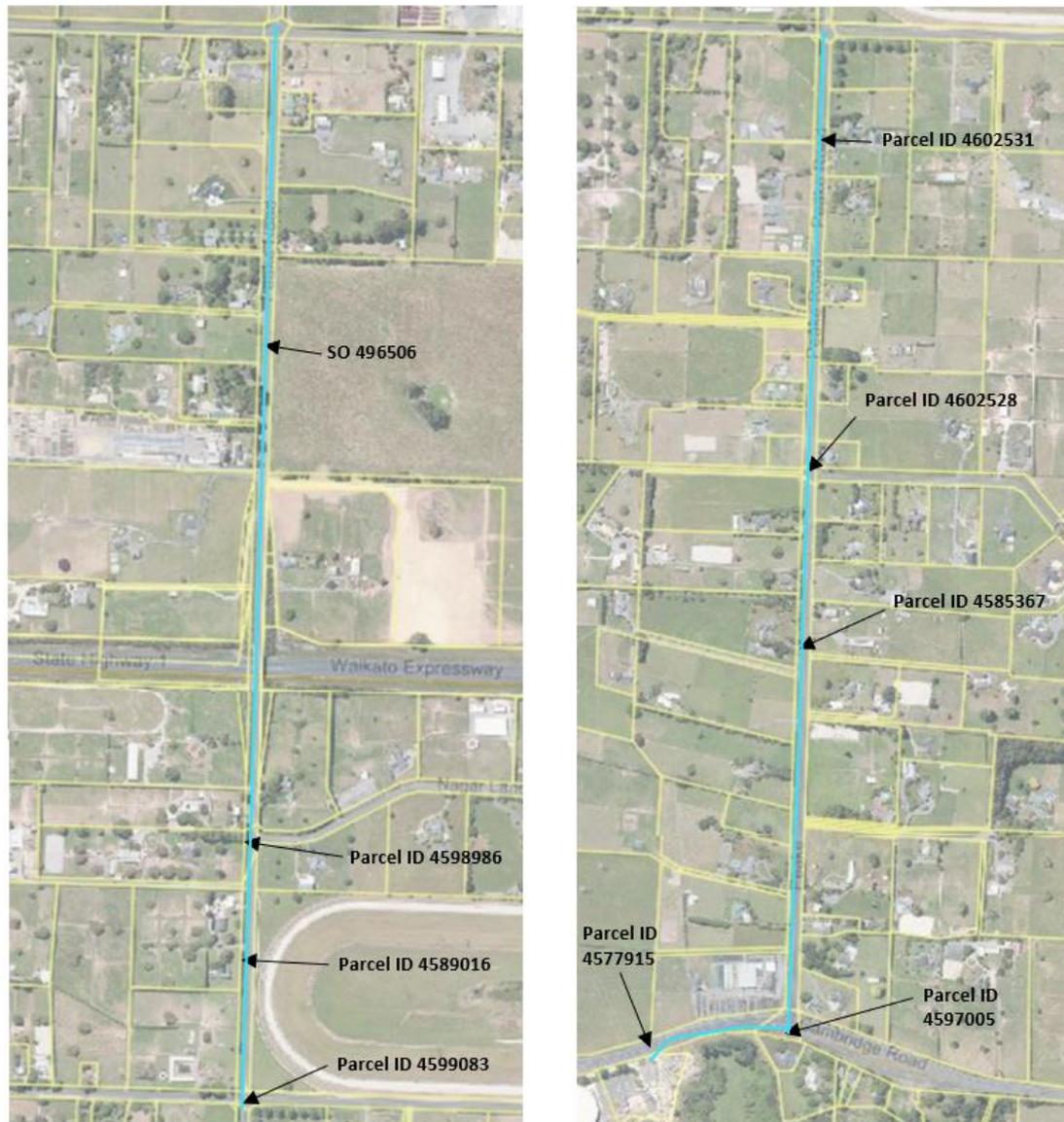
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APPENDIX B: DETAILED AERIAL PLANS



Plan showing the Area to the south of Cambridge Road with pipeline indicated by blue line and diffuser by yellow square (source: Waipa District Intramaps)



Left: plan showing the existing pipeline alignment to be upgraded in the road reserve on Hautapu Road and on Peake Road (between Hautapu Road and Racecourse Road). Right: plan showing the alignment on Peake Road between Racecourse Road and Cambridge Road (source: Waipa District Intramaps)



Plan showing the location of existing Fonterra Dairy Factory, proposed WWTF site in Lot 1 DPS 13529 and property containing the balance and calamity tanks and pipeline connection to existing wastewater and silo pump compound included (source: Waipa District Intramaps)

