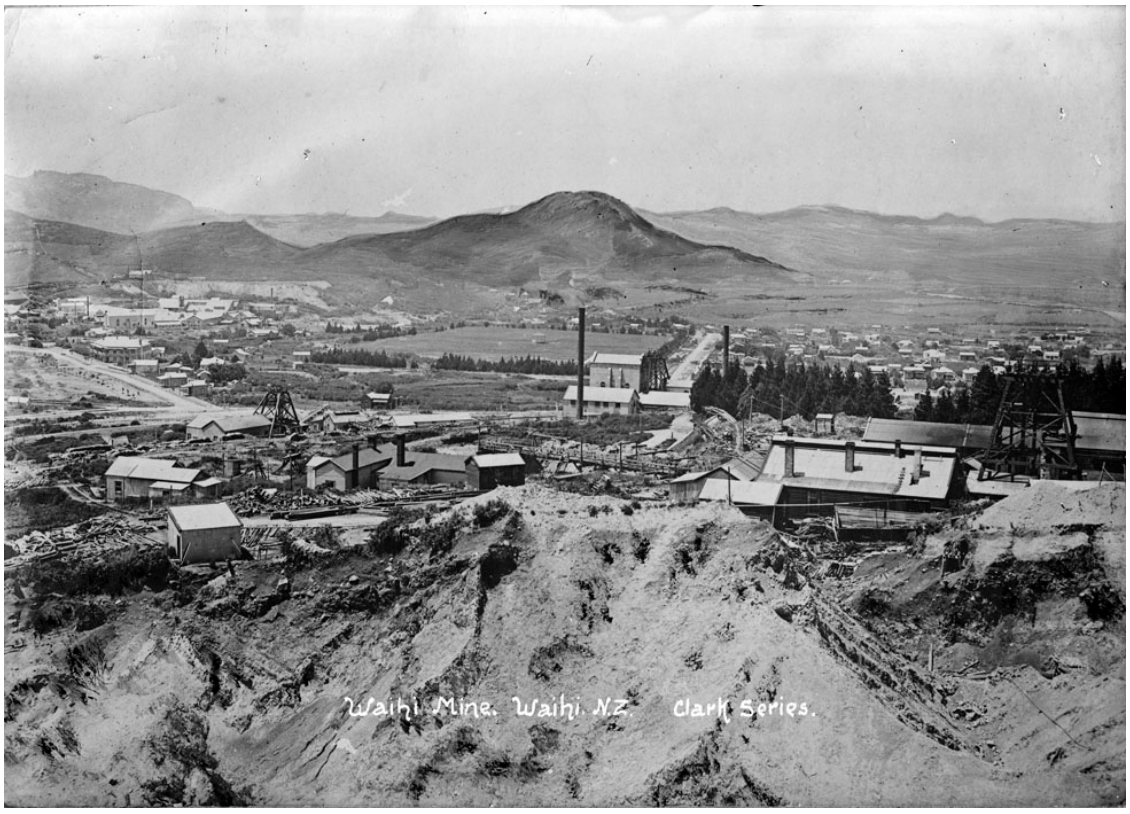
OCEANAGOLD WAIHI NORTH PROJECT, WAIHI: PART 1 HISTORICAL & ARCHAEOLOGICAL BACKGROUND

Prepared for Oceana Gold (New Zealand) Ltd
Final May 2018



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Contents

Introduction....1
Project Background....1
Methodology....1
Historical Background....3
Maori Settlement....3
Goldmining in Waihi....11
Water Races....44
Tramways....45
Other Industry and Infrastructure....47
Waihi Township....53
Later History Waihi....66
Past Archaeological Investigation....71
Physical Environment Context....85
Geology....85
Reefs of the Waihi goldfields....87
Topography and Land Use....89
Summary of Results....92
Bibliography....94

Image on front cover: Looking from Martha Hill to the Waihi Gold Mine (sourced from Sir George Grey Special Collections, Auckland Libraries, 35-R1469)

INTRODUCTION

Project Background

Oceana Gold (New Zealand) Ltd (OGNZL) is proposing to extend the Waihi mine activities by developing additional resources, which is named 'Waihi North Project' (Figure 1; Figure 3).

A heritage impact assessment was commissioned by OGNZL to establish whether the proposed Waihi North Project is likely to impact on historic heritage values. This 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 for the purpose of an application for an Authority to modify various archaeological sites under the Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA). Recommendations are made in accordance with statutory requirements.

The heritage impact assessment has been divided into two parts:

- Part 1 historical and archaeological background – outlining the historical background research for the general area; and,
- Part 2 historic heritage assessment – identification of historic heritage places impacted by Waihi North Project; potential positive and adverse effects; and, mitigation of effects on historic heritage values within the project area.

Methodology

This Part 1 report provides the historical background and summary of archaeological and built heritage investigations in the general area of Waihi North Project. It informs the Part 2 Waihi North Project report (Tatton and Clough 2021) so that the effects on historic heritage values are assessed against a robust evidence base.

The NZAA site record database (ArchSite), Hauraki District Plan schedule and the Heritage New Zealand Pouhere Taonga (Heritage NZ) New Zealand Heritage List were searched for information on sites recorded in the vicinity. Literature and archaeological reports relevant to the area were consulted (see Bibliography). Plans, maps and photographs from collections such as the Sir George Grey Special Collections (Auckland Libraries), Auckland War Memorial Museum, Alexander Turnbull Library, Archives New Zealand, and Land Information New Zealand (LINZ) were searched for relevant material to the project area. Certificates of Title and Residence or Business Site Licenses were searched through LINZ and Archives New Zealand to establish ownership of specific sites in the project area.

Aerial photographs dating to 1942 and historical plans were also examined (and compared to present day aerials) to establish past activities within the project area that may no longer be extant. Archaeological sites beneath buildings and sealed surfaces (such as in Waihi town) can rarely be identified prior to being exposed in the course of redevelopment work, and the approach to archaeological assessment in these more urban environments is therefore to identify historically recorded activities on the site, and assess the potential for archaeological evidence to have survived on the basis of later modifications to the site.

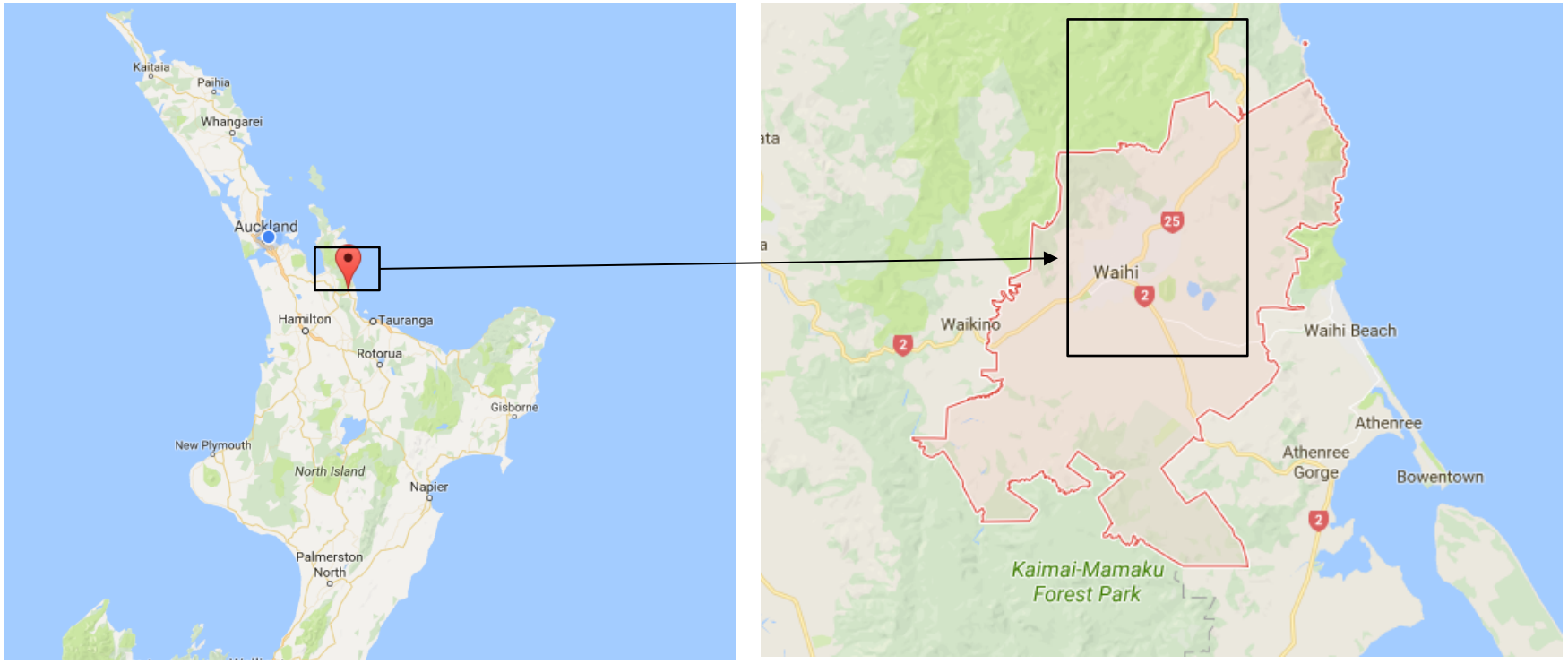

Figure 1. General location map showing the regional context for the Waihi North Project (source: Google Maps 2020)

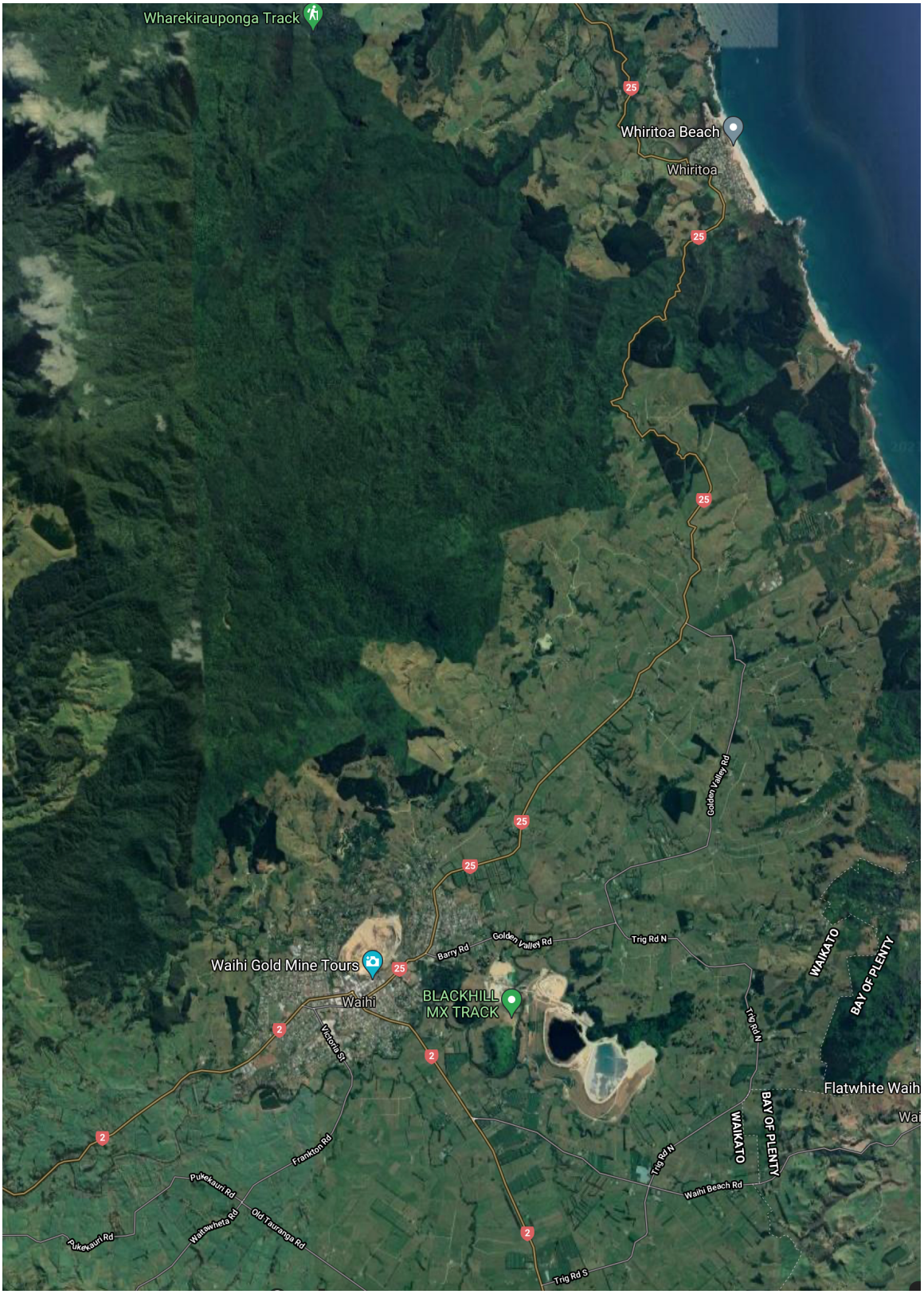

Figure 2. General location map showing the regional context for the Waihi North Project (Google 2021)

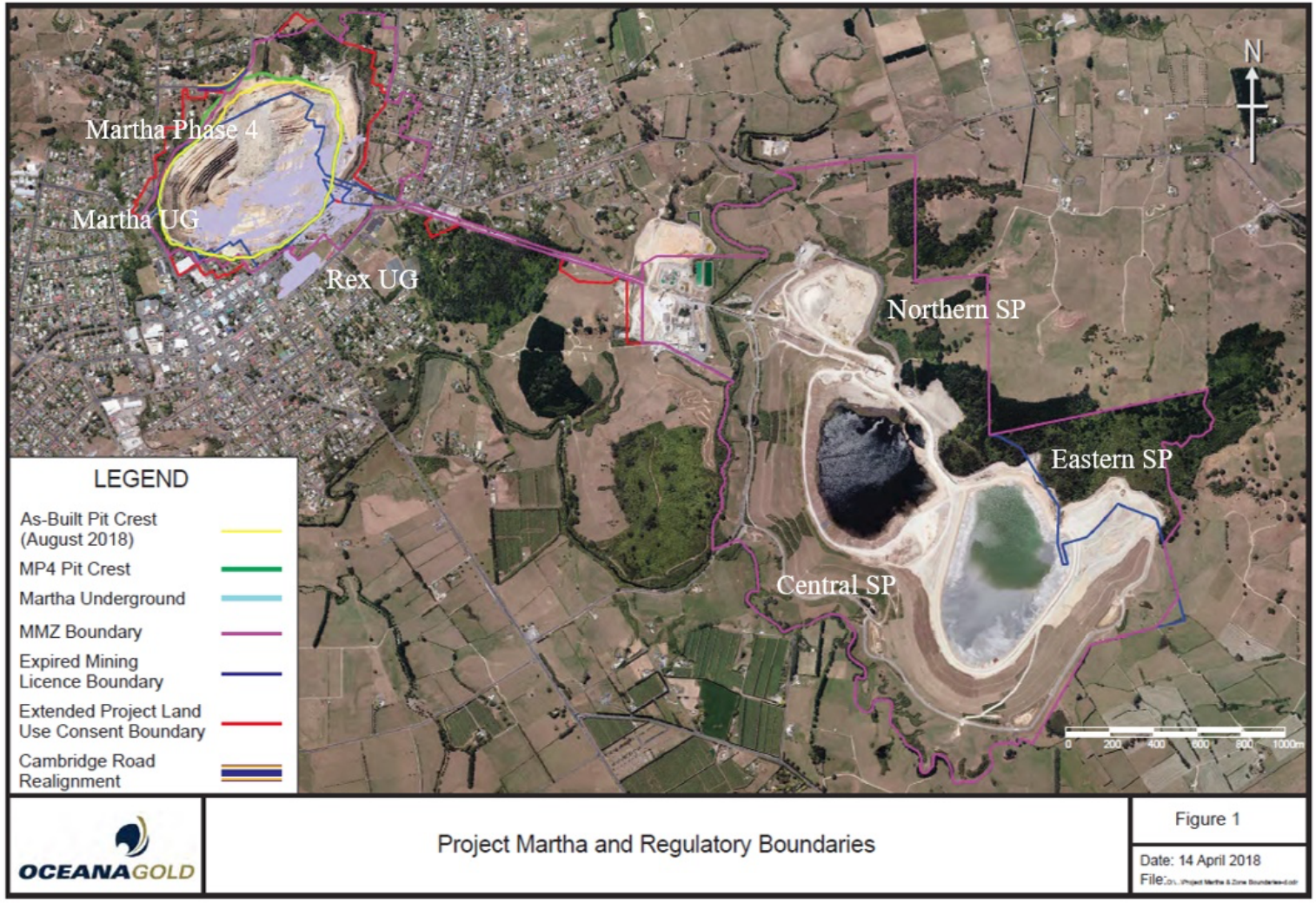

Figure 3. Waihi North Project Area

HISTORICAL BACKGROUND

Maori Settlement

Situated at the foothills of the Coromandel Peninsula, the inland area of Waihi formed part of the Ohinemuri district, which comprised two lowland zones divided by the Karangahake Gorge, bounded to the north by the Coromandel Range and to the south by the Kaimai Range. East of the Karangahake, the Waihi plain was a poorly drained circular basin from which the headwaters of the Ohinemuri River emerged and was predominantly covered in scrub and fern.[1] Nearby navigable rivers included the Ohinemuri, Piako, and Waihou, whose river flats were covered with large stands of kahikatea. Waterways supported stocks of eel and other marine resources and a number of native bird species, including brown and grey ducks, pukeko, bitterns, and migratory waders, were plentiful among the swamplands of the region's plains.[2] The rich resources of Ohinemuri attracted Maori to the area and occupation can be traced back over centuries; evidenced by the numerous archaeological sites (namely middens, pits, terraces, and pa) and associated place names throughout the district. Several different iwi and hapu groups claim affiliation with the land including Ngati Hako, Nga Marama, Marutuahu Tribes, Ngati Koi, and Ngati Tara, whose tribal territories commonly changed in response to warfare, migration or intermarriage.[3]

The earliest Maori settlers in the wider Hauraki region (which stretched from Katikati near Tauranga in the south to Mahurangi in the north) are acknowledged to be Ngati Hako.[4] By the 18th century the Hauraki region was dominated by the settlement of the Marutuahu confederation which comprised Ngati Rongou, Ngati Tamatera, Ngati Whanaunga, Ngati Maru and Ngati Paoa. The tribes traced their descent from a common ancestor, Marutuahu, whose forebears arrived in Aotearoa aboard the Tainui waka.[5] Other tribes also maintained a presence alongside the Marutuahu including Ngati Tara, relatives of Ngati Maru and Ngati Tamatera, who followed their kin into the Hauraki region but maintained their own distinct identity. Ngati Tara formed alliances with Ngati Hako through intermarriage and eventually controlled land between the Waihou River and Owharoa, near Ohinemuri. In the process, they also acquired the alternative name – Ngati Koi.[6] Ngati Tara/Koi clashed frequently with Nga Marama groups in and around the areas of Waihi and Katikati until the early 1800s and formed alliances with Ngati Tamatera at that time.[7] By the early 19th century many of the tribes had intermarried, forming complex ties to one another, and the Hauraki region was subsequently 'occupied by an intricate patchwork of groups,

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[1] L. Barber, No Easy Riches: A History of Ohinemuri County, Paeroa and Waihi, 1885-1985, 1985, Auckland, p.19.
[2] Ibid., p.20; Waitangi Tribunal, The Hauraki Report (Volume One) Wai 686, Wellington, 2006, p.34.
[3] While based on reliable documentary sources, this information should not be viewed as complete or without other context. There are a large number of iwi historically associated with the Auckland region and many other histories known to tangata whenua. Taimoana Turoa, *Te Takoto o Te Whenua o Hauraki: Hauraki Landmarks*, Auckland, 2000, p.194.
[4] Te Ahukaramu Charles Royal, 'Hauraki Tribes', in Ministry for Culture and Heritage, *Maori Peoples of New Zealand, Nga Iwi O Aotearoa*, Auckland, 2006, pp.77-78; Waitangi Tribunal, The Hauraki Report (Volume One) Wai 686, Wellington, 2006, p.35.
[5] Ibid., pp.40-41; Te Ahukaramu Charles Royal, 'Marutuahu Tribes', in Ministry for Culture and Heritage, *Maori Peoples of New Zealand, Nga Iwi O Aotearoa*, Auckland, 2006, p.87.
[6] Waitangi Tribunal, The Hauraki Report (Volume One) Wai 686, Wellington, 2006, p.42.
[7] Ibid.

predominantly of Marutuahu descent, intermingled with groups of earlier occupants' (see Figure 4).[8]

Early Maori settlements throughout Hauraki were primarily established near shorelines and major rivers and were occupied either long-term, seasonally, or temporarily, according to the availability of food resources. Across the region areas of large-scale cultivatable land, able to support large village groups, were limited and many hapu were obliged to negotiate rights to access various resources across the district.[9] Changing alliances, migration and warfare resulted in a detailed system of customary land rights which was based on various factors such as ahi ka (continuous residence and cultivation), raupatu (conquest), tuku ('gift' or permission to occupy), and ancestral occupation.[10] Kin groups were generally dispersed and mobile, maintaining claims in a number of areas; however, many parts of the region were regarded as 'whenua tautohe', contested between two or more claimant parties.[11]

In response to threats from warring groups Maori began to construct defensive settlements known as pa around 1500AD, which were sited on strategic areas such as headlands and volcanic cones. Many pa were located on prominent sites across the Hauraki and Ohinemuri areas, including at Waihi where the ridge pa known as Motu Keho was constructed on what is now Black Hill (NZAA T13/815).[12] Situated along a bend in the Ohinemuri River and with views across what is now the Waihi township, Motu Keho was the location of a battle between Nga Marama and Ngati Tara. According to F.L. Phillips, the skirmish originated when the young men of Ngati Tara:

> '…heard of the beauty of two young girls of Ngamarama [sic], named Taunamahopu and Tai Whakireihua, who lived at Motu Keho. When the suitors from Ngati Tara – Horokoki, Te Hakiri and Te Aranui – arrived there, they were repulsed by the chiefs of Motu Keho, who drove them off with stones. Ngati Tara prepared a war party of 340 warriors, who attacked and took Motu Keho. There are two ancient pa on the ridge almost encircled by the Ohinemuri, and Motu Keho was probably that on the crest of that ridge. In the attack several warriors of Ngamarama [sic] were killed and the remainder fled to Waihi [beach] when the chief Nga Puputuarua was killed.'[13]

A pa may have also stood near the base of Pukewa (now Martha Mine) and the hill is known to have been used by Maori as an urupa, a sacred place to bury their dead.[14] Nearby Gladstone Hill is also thought to contain urupa, and Maori burials are believed to have taken place within a number of caves across the site.[15]

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[8] Ibid., p.43.
[9] Ibid., p.44.
[10] Ibid.
[11] Ibid.
[12] Note: This site is recorded by the NZAA as Motu Kehu (NZAA T13/815).
[13] F.L. Phillips, Nga Tohu a Tainui - Landmarks of Tainui: historic places of the Tainui people, Volume Two, Otorohanga, 1995, pp. 180-181.
[14] Turoa 2000, p.194; Caroline Phillips 2000. Waihi Gold Mining Drilling Extension. Archaeological report prepared for the Waihi Gold Mining Company, p.8.
[15] Phillips 2000, p.8. C. Phillips notes that the slopes of hills in and around what became the Waihi township may have been utilised by Maori for gardening or other purposes to support settlement.

Intertribal warfare, largely over the control of resources, continued across the wider Hauraki region throughout the 18th century and into the early 19th century; however, the musket raids of the 1820s, led by Ngapuhi from the north, proved the most destructive. Defending Hauraki warriors, armed only with traditional hand combat weapons such as mere and taiaha, were swiftly defeated. Most fled the invasion, leaving the region virtually deserted for several years.[16] The majority of Hauraki inhabitants sought safety in the Waikato, where they made alliances with local tribes and were given permission to occupy certain lands. However, by the late 1820s relationships between Waikato Maori and Marutuahu had become strained and conflict eventually occurred with Ngati Haua, under the chief Te Waharoa, from Matamata. Battle culminated at Taumatawiwi around 1830 with both sides suffering heavy losses. At the cessation of fighting Marutuahu accepted an offer of safe passage by Te Waharoa to leave the district and return to the Hauraki, and they began to re-establish traditional occupation areas from around 1831.[17]

The Hauraki region remained an area of volatility throughout the 1830s (see Figure 5). Following the Ngapuhi raids, traditional rights to own and control land were further complicated by altered relationships between tribes and the fact that not all groups returned to the exact areas they had occupied 10 years prior.[18] A zone of conflict existed around the Ohinemuri River area (including Waihi) and campaigns were launched by Ngati Tamatera, led by Taraia, to evict Ngati Haua from occupying Te Aroha and the surrounding land.[19] The threat of violence between intertribal groups in the Ohinemuri area existed well into the 1840s and in 1846 the trader-settler Albert John Nicholas noted the fear of attack communicated by his Ngati Haua crew when accessing the Waihou River.[20]

During the New Zealand Wars of the 1860s (Figure 6) the Ohinemuri district became a stronghold for supporters of the Maori Kingitanga movement.[21] The prevalence of Kingitanga support throughout the Ohinemuri district in part assisted its continued isolation during the New Zealand Wars, and the area (including Waihi) was not among those lands confiscated by the Crown at the cessation of hostilities.

In the post-war years of the late 1860s Ohinemuri remained hostile and unsettled, with links to Te Kooti and the rise of the religious movement known as Pai Marire (or Hau Hauism).[22] Following meetings between Pai Marire delegates and Te Hira Te Tuiri (of Te Matewaru a hapu of Ngati Tamatera), a leading figure in the Ohinemuri Kingitanga aukati, in 1867 Government officials were subsequently banned from entering the land.[23] The opposition posed difficulties for the Crown, who were now interested in the Ohinemuri area as an extension of the Thames goldfield (whose southern boundary was fixed at Omahu Stream).[24] Protracted negotiations continued throughout the late 1860s to early 1870s and in November 1869 a meeting between Ohinemuri Maori and E.W. Puckey, the

[16] Waitangi Tribunal, The Hauraki Report (Volume One) Wai 686, Wellington, 2006, pp.44-46.
[17] Ibid.; Barber 1985, pp.22-23.
[18] Waitangi Tribunal, The Hauraki Report (Volume One) Wai 686, Wellington, 2006, p.47.
[19] Ibid.
[20] Barber 1985, p.23.
[21] Waitangi Tribunal, The Hauraki Report (Volume Two) Wai 686, Wellington, 2006, p.409.
[22] Pai Marire was founded by Te Ua Haumene in 1862 following a visitation by the Archangel Gabriel. The aim of the religion was the unification of all Maori and 'salvation from the Pakehas'. Waitangi Tribunal, The Hauraki Report (Volume Two) Wai 686, Wellington, 2006, p.409; Barber, 1985, p.25.
[23] Waitangi Tribunal, The Hauraki Report (Volume Two) Wai 686, Wellington, 2006, pp.409-410.
[24] Ibid.

government's acting civil commissioner at Thames, prompted Unaki, a Hau Hau spokesman, to voice the following:

> 'Ohinemuri will not be ceded to the government. If any of the Maoris sell or lease, they will not allow government or pakeha to have peaceful possession. Never! Hauraki is all that the pakeha should have. Work there and enjoy the benefits. You may ask for Ohinemuri, but you will never get it. That word was for ever.'[25]

Gold mining prospectors and the Crown were largely excluded from the Ohinemuri area until the 1870s. In 1871 Te Hira warriors barred the Queen's mail from being carried from Ohinemuri to Waihi.[26] Hau Hau war parties regularly drove off gold prospectors and there were threats to disallow all boat transport along the Waihou River.[27] The Pai Marire maintained a presence in the region until the mid-1870s; however, the gradual surveying and hearing of claims through the Maori Land Court, and the growing government practice of advancing loans (raihana) which were expected to be repaid in land payment, eventually diminished their influence as a political power.[28] The vestiges of the Hau Hau movement were overcome by the government proclamation of Ohinemuri as an official goldfield on 3 March 1875 (Figure 7).[29] The announcement also quashed the proposed retention of the Ohinemuri as a Maori reserve.[30] The reaches of the goldfield made their way towards Waihi by the late 1870s and one of the earliest gold prospectors in the area, John McCombie, described Waihi as:

> '…comprising thickly wooded hills and open plain, the latter being covered over with a stunted growth of fern and Manuka scrub indicating poverty of the soil. At the time of which I write [1878] there were no Europeans in the locality, and only a few Natives belonging to the Ngatikoe [Ngati Koi] Tribe who lived on the bank of the Ohinemuri River about a mile and a half from the present Waihi Township.'[31]

European settlement expanded rapidly around the Waihi goldmines from the late 1870s onwards and by 1882 the nearest Maori owned land to the township was the Mangakiri reserve for Ngati Koi at Waitete, south-east of Waihi.[32]

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[25] Barber 1985, p.26.
[26] Waitangi Tribunal, The Hauraki Report (Volume Two) Wai 686, Wellington, 2006, p.420.
[27] Barber 1985, p.26.
[28] Waitangi Tribunal, The Hauraki Report (Volume Two) Wai 686, Wellington, 2006, pp.421-422.
[29] Ibid., pp.422-423; Barber 1985, p.27.
[30] Ibid.
[31] J.B. McAra, *Gold Mining at Waihi, 1878-1852*¸Waihi, 1988, pp.29-30. Note: Caroline Phillips argues that McCombie was in error when he wrote about the poverty of the soil at Waihi and contends that 'the fern and manuka scrub indicated that the area had been cleared for gardening purposes by Maori and left to regenerate.' Phillips 2000, p.8.
[32] Waitangi Tribunal, The Hauraki Report (Volume Two) Wai 686, Wellington, 2006, p.447.

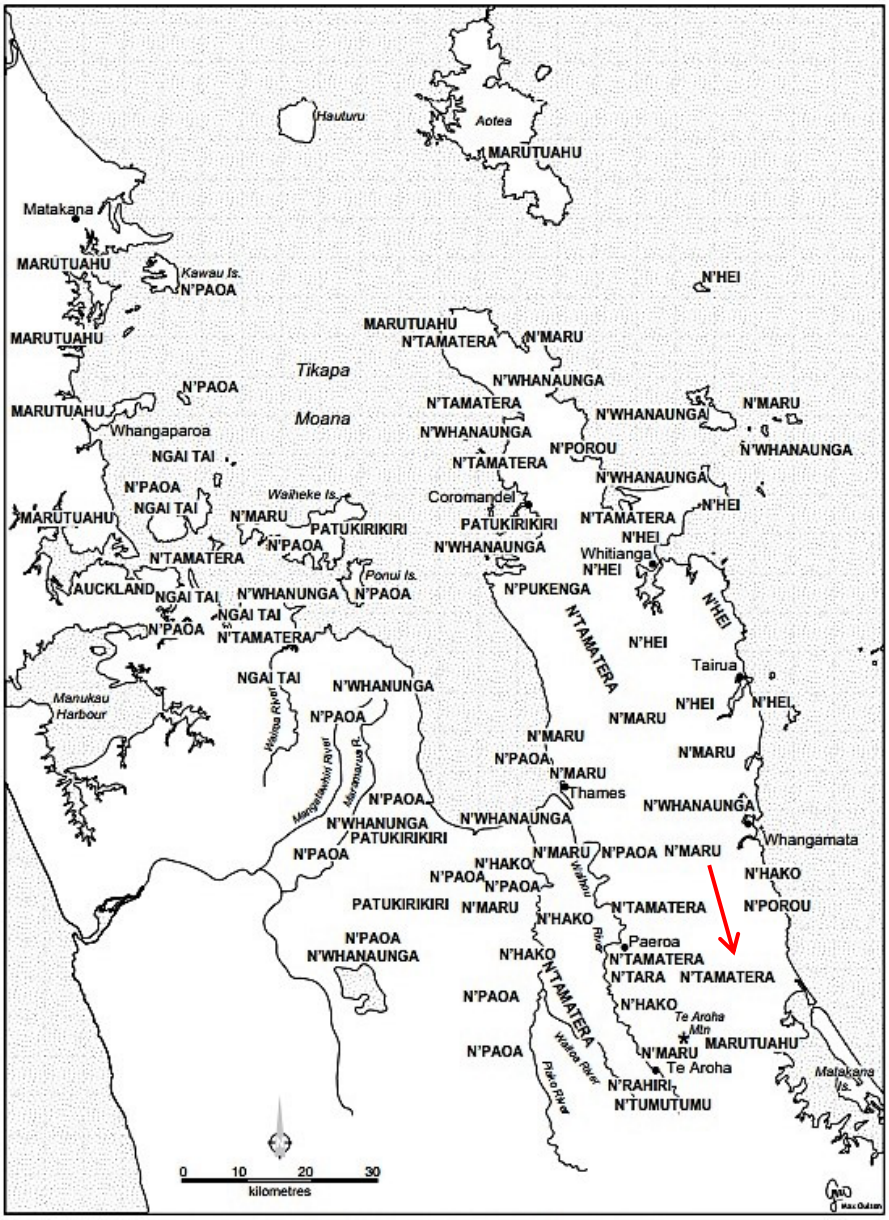

Figure 4. Hauraki tribes, c.1840. The approximate location of Waihi township is arrowed in red. (Source: Waitangi Tribunal, The Hauraki Report (Volume One) Wai 686, Wellington, 2006: 36)

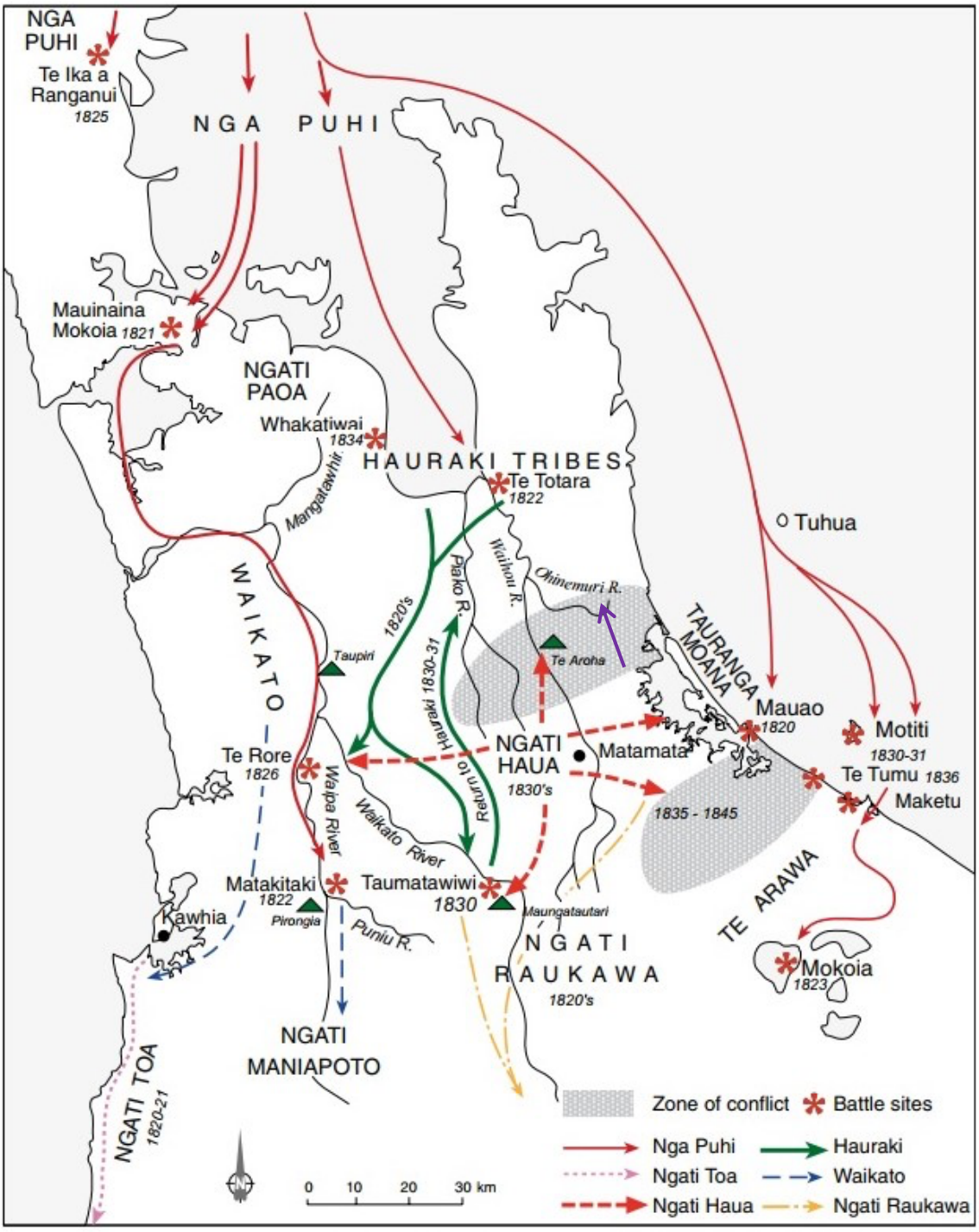

Figure 5. Tribal movements, 1820-1840. The approximate location of Waihi township is arrowed in purple (source: Waitangi Tribunal 2006: 45)

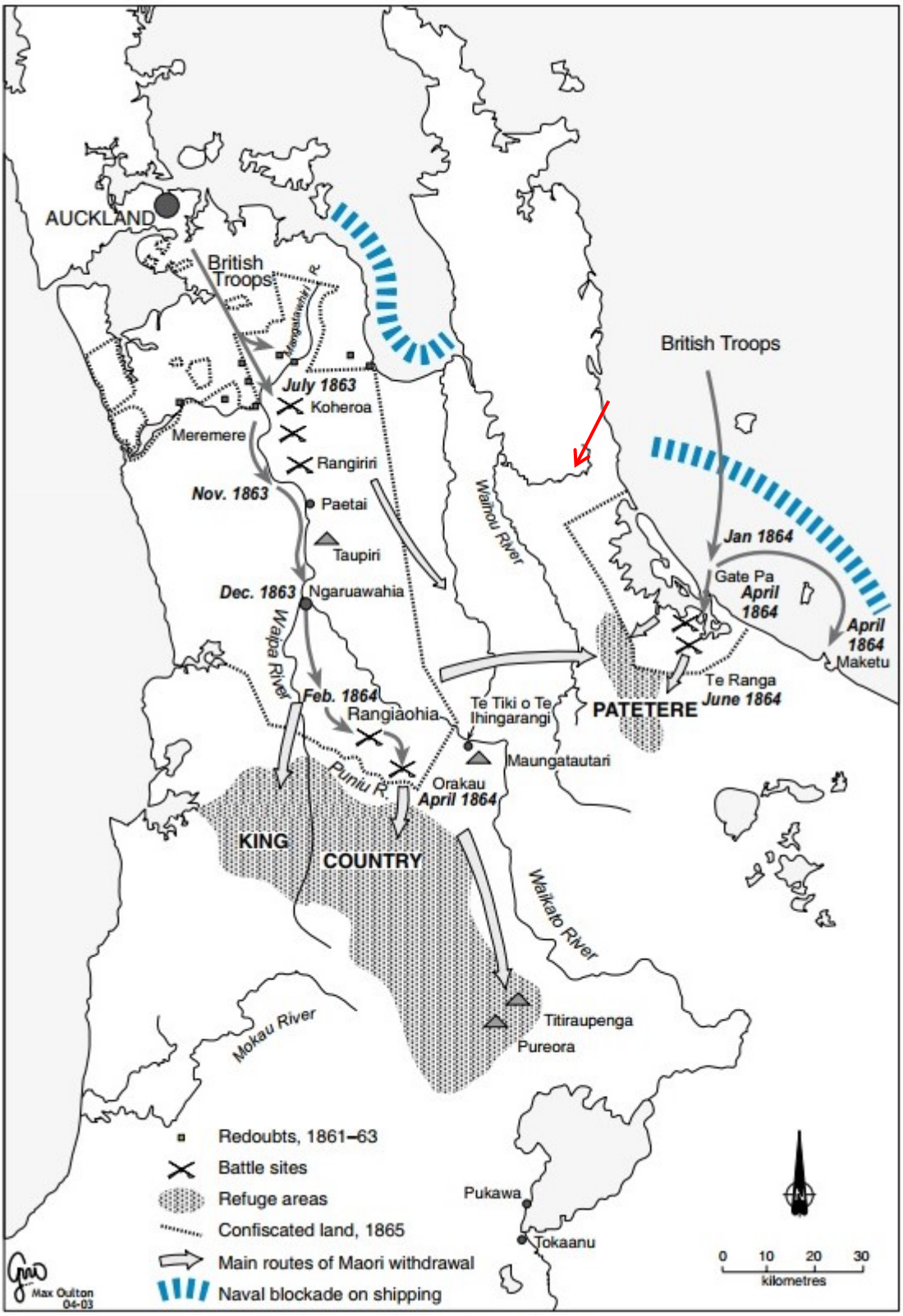

Figure 6. Waikato campaign, 1863-1864. The approximate location of Waihi township is arrowed in red. (Source: Waitangi Tribunal 2006: 192)

Figure 7. Sketch map of the Ohinemuri Goldfield, dated c.1875 (source: Sir George Grey Special Collections, NZ Map 133)

Goldmining in Waihi

Early Prospecting, 1860s-1892

Quartz outcrops in the Waihi area drew European explorers and prospectors to the region long before Ohinemuri was officially declared a goldfield. The earliest recorded discovery of gold was made at Waihi Beach by Jonathan Brown, John Macpherson, William J. Gundry, Arthur A. Crapp, and John S. Talbot in 1868. The party wrote a claim to Superintendent Gillies in 1870, which may have included what is now Waihi township and Martha (Pukewa) Hill, although there is no evidence to suggest their claim was awarded (Figure 8).[33] Sir James Hector, a Scottish-born geologist, visited Waihi in 1870 and made reference to quartz reefs in a subsequent geological report. Hector observed the efforts of earlier prospectors and noted the 'places where the ground has been tried.'[34] Following the opening up of the Ohinemuri goldfield in 1875 large numbers of diggers flocked to the nearby areas of Karangahake, Mackaytown, Waitekauri and Owharoa, although the quartz gold hills (as opposed to alluvial gold) proved to be 'no El Dorado'.[35] Prospectors Daniel Leahy and Scott O'Neill discovered payable gold at Waitekauri and in 1876 they travelled eastwards to Waihi, where they set up camp and began to examine the quartz reefs of the Rosemont and Silverton hills.[36] The pair were followed by Corbett and Merriman, who tested the same area, although neither of the parties were able to find workable gold and the reef was dismissed as 'buck' or barren.[37]

The first successful prospecting for payable gold in Waihi [township] was undertaken by John McCombie and Robert Lee in 1878. Travelling eastwards from the Waitekauri diggings the pair noticed:

> '…quartz comprising the outcrop of the now famous lode glistening beneath the rays of the morning sun; and when we came to the Mangatoetoe Stream the first dish of rubble panned gave a good prospect of free gold. This convinced us that we were in an auriferous region, and we hastened on to an outcrop of the lode, looming sharply up on the cone of Pukewa (later Martha Hill and Mine) spur, which rises abruptly out of the plain to a height of about 250 feet. We soon covered the intervening space and had out picks at work breaking out ore from its rugged walls.'[38]

McCombie and Lee observed that 'the outcrops of several other reefs were visible on adjacent hills', which would have included the Rosemont-Union and Amaranth lodes, and continued to test the lode on Pukewa by driving a crosscut of about 200 feet from the

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[33] P.R. Moore, 'Discovery of Gold at Waihi Beach', *Ohinemuri Regional History Journal*, 43, September 1999, accessed via: http://www.ohinemuri.org.nz/journals/71-journal-43-september-1999/1567-discovery-of-gold-at-waihi-beach

[34] Nellie Scott Climie, *Waihi Borough Council Diamond Jubilee¸ 1902-1962*, Paeroa, 1962, p.37; *Wanganui Herald*, 18 January 1870, p.2; J. Hector, 'Geological Structure of the Kaimanawa Range', *Transactions and Proceedings of the Royal Society of New Zealand*, Volume 3, 1870, pp.16-17.

[35] Barber 1985, pp.33-4; Climie 1962, p.37.

[36] Climie 1962, p.37; J.B. McAra, *Gold Mining at Waihi, 1878-1952*, Waihi, 1988, p.28. Note: Rosemont was the first name for the hill containing the Amaranth, Union and Rosemont claims. Rod Clough, Simon Best and Ray Hooker, 2004, Union Hill Waihi: A Heritage Assessment. Clough & Associates report prepared for Newmont Waihi Gold, p.15.

[37] Ibid.; Don Lockwood, *Pukewa Waihi*, Waihi, 2003, p.72. Note: Climie records the names of the second pair of prospectors as Corbett and Marriman.

[38] *New Zealand Herald*, 23 June 1894, p.1 (Supplement).

western side of the spur.[39] After several months of work the pair obtained two tons of ore which was assayed at £4.14.0d per ton.[40] Despite the results, the potential of Pukewa 'was reported upon unfavourably by almost everyone who paid the place a visit, and who considered themselves authorities on anything appertaining to gold and silver mining', and McCombie and Lee left their workings to try prospecting at Te Aroha.[41] The Waihi area was later tested by William Nicholl, a Coromandel prospector, who arrived in 1879 and examined reef outcrops of several Waihi hills (including the Rosemont and Union reefs).[42] Nicholl described the reefs as 'rooted about here and there by the early diggers who had abandoned them' and noted 'I tested the rubble on these outcrops at various places and never failed to obtain a trace of gold but not sufficient to be of any value.'[43] He later prospected on Pukewa and discovered gold on an outcrop some 200 feet away from McCombie and Lee's earlier tunnel.[44] Nicholl spent two weeks gathering samples on Pukewa and applied for a claim of 5 acres at the northern end, which he named 'Martha', after his sister, Martha Dulcibel Nicks.[45]

Nicholl was soon joined by his friends and fellow prospectors Robert Majurey, J. Nicks, J. Patten (or Paton), B. Potter and T. Gilmour, who applied for several claims along the line of the Martha lode.[46] Fred Hollis also visited the site around 1879-1880 and subsequently pegged out a claim to the north of Nicholl's 'Martha' which he named 'Young Colonial'.[47] The success of the area attracted further claims and Parliamentary Papers, dated 1880, noted a dozen recorded claims including: Martha, Rosemont, Dulcibel, Union, Young Colonial, Silverton, Amaranth, Britannia, Winner, Old Waihi, Nelson and Nut.[48] The claims were initially held by small syndicates, which, by November 1881 included the Waihi Goldmining Company ('Manukau' Jones) and the Martha Company.[49] The first directors of the Martha Company were C.J. Stone, Wilson, Adam Porter, Firth, R. Majurey, and W. Nicholl, and shortly after its formation Nicholl recalled:

> 'By this time a bit of a rush had set in, and about a dozen claims pegged out, five being pegged out on the Martha Hill, the hill taking the name from its prospecting claim. Mr. Manakau [sic] Jones staked a claim on the southern end of the hill, and bought the claim between him and the Dulcie. Mr. John Leydon (auctioneer) staked on the north side of Messrs. Hollis Bros. Mr. John McCombie and Mr. Andy Wilson staked the Silverton Hills. Mr. Alec. Macky staked a claim on the south end of the Amaranth Hill.'[50]

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[39] Ibid.; *Auckland Star*, 14 September 1921, p.8; Clough 2004, p.24.
[40] Ibid.
[41] *New Zealand Herald*, 23 June 1894, p.1 (Supplement).
[42] Clough 2004, p.24; McAra 1988, p.41.
[43] Ibid.
[44] McAra 1988. p.37, Climie 1962, p.44.
[45] McAra 1988, pp.39 & 41.
[46] Climie 1962, p.44.
[47] Ibid.
[48] McAra 1988, p.39; Climie 1962, p.45.
[49] Climie 1962, p.45; *Thames Star*, 21 March 1881, p.2; *Thames Advertiser*, 23 November 1881, p.3.
[50] *Auckland Star*, 8 September 1921, p.7.

In 1882 H. Adams constructed a battery on the eastern side of Martha Hill for the Martha Company which contained 15 stamps.[51] The battery was one of two erected by Adams at Waihi that year; the other belonged to 'Manukau' Jones (the Waihi Goldmining Company) and was built near the junction of the Ohinemuri River and the Mangatoetoe Stream.[52] James Gribble was appointed the first manager of Martha Mine; however, progress stalled in 1882 when an insufficient supply of water rendered the newly constructed Martha Battery useless.[53] Faced with reduced production and poor results the Martha, Young Colonial and Waihi claims were amalgamated under the Martha Extended Company in 1883.[54] Progress was made following the relocation of the Martha battery to 'Manukau' Jones' site along the Ohinemuri River. The combined facility worked 30 stamps and was referred to as the Martha Battery (NZAA T13/311).[55] With the amalgamation of the Dulcibel in January 1884 the Martha Mine became the only surviving claim in Waihi.[56]

The area continued to draw large numbers of prospectors throughout the 1880s and a report by Mining-Inspector McLaren for the year ending March 1886 noted:

> 'The Nil Desperandum, Yellow Jacket, Winner, Nelson, Amaranth and others are all vigorously prospecting; and, as they are discovering loose stones showing the best indications, I am led to believe they will shortly lead to the further importance of this portion of this field by making valuable discoveries.'[57]

H. Kenrick, of the Thames Warden's Office, also reiterated that

> 'during the past year some very rich reefs and leaders have been discovered and opened up in the Silverton, Union, Rosemont, and other claims, the stone obtained being very different from any previously got in the district—it is largely impregnated with silver, and has [a]ssayed up to very high figures.'[58]

From 1885 the Union claim was operated by the Union Gold Mining Company, which drove a shaft 76ft deep and made an open cutting – extracting 15 tons of 'first-class ore' by March 1886.[59] The Silverton claim, situated on the south-western side of Waihi, was made by John McCombie in August 1885 and worked by the Silverton Gold Mining Company, of Auckland, and later by the Waihi-Silverton Gold Mining Company, of Glasgow.[60]

Despite the growing numbers of claims in the Waihi area, yields remained low and profit margins tight. The nature of the terrain (i.e. quartz reefs) required significant investment in heavy equipment for processing, a cost beyond the reach of most small companies.[61] The

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[51] Ibid.; Climie 1962, p.45; Eric Lens, *A History of the Waihi/Martha/Silverton/Union Battery Waihi, 1882-1915*, np, p.6. The first Martha Battery was constructed 'on the site which was later occupied by the mine manager's residence, a short distance east of No. 4 shaft and near Junction Road…' McAra 1988, p.39.
[52] McAra 1988, p.40; Lens, 2017, p.6.
[53] Climie 1962, p.45.
[54] Ibid., p.46.
[55] Lens 2017, pp.32-33. Lens also notes that the Martha Battery was the only one operating in Waihi until 1888. Lens 2017, p.4.
[56] McAra 1988, p.40; Clough 2004, p.25; *Thames Advertiser*, 22 January 1884, p.2.
[57] Appendices to the Journals of the House of Representatives (AJHR) 1886 C-04A, p.12.
[58] Ibid., p.5.
[59] Clough 2004, p.14, McAra 1988, p.50; AJHR 1886 C-04A, p.11.
[60] Lens 2017, p.48; NZAA site record form T13/311.
[61] Barber 1985, pp.37-38.

Union Gold Mining Company ceased operations in 1887. Unable to raise the necessary capital the (Union) claim was taken up by the Waihi Gold and Silver Mining Company, a newly formed concern established by prominent Auckland businessman Thomas Russell.[62] The company was floated on the London stock exchange and operations began at Union Hill in 1888 (Figure 9). The Waihi Battery (NZAA T13/823), sited at the foot of Union Hill, was under construction that same year and by 1890 the mine was declared a success.[63] The company also acquired other workings in the Union Hill area, including the Rosemont, Amaranth and Winner claims, with the exception of Silverton, which continued under the Silverton Gold Mining Company.[64] Between 1883 and 1889 the Martha Extended Company crushed 28,496 tons for a yield of £17,370 and the annual government report on gold mines for 1887-1888 stated: 'The Martha Company still continue to work their mine, although the quartz is of very low grade; however, it is found that the mine will only pay the company by letting it on tribute. The reef is about 30ft. in thickness, but only very small portion of this contains sufficient gold to pay for working.'[65] The company let the mine on tribute to the Hollis Brothers, who continued to work a low yield, with around 16 employees in 1889.[66]

By 1890 the Martha Extended Company was facing insolvency and the business was purchased by Thomas Russell for £3000 that same year.[67] Russell on sold the company, including the neighbouring claims of 'Britannia', 'Nut', 'Go Ahead', 'Victory', and 'Monmouth', to the Waihi Gold and Silver Mining Company in 1890.[68] He received £20,000 in paid-up shares and oversaw the reconstruction of the Waihi Battery (at the foot of Union Hill), which involved trialling various extraction processes and the addition of 60 stamps between 1891 and 1894.[69] Following the sale of the Martha Extended Company the Martha Battery was deemed surplus to requirements and was sold to the Silverton Company in 1891, who renamed it the Silverton Battery (NZAA T13/311).[70] The battery was mentioned in Warden Northcroft's annual report, dated May 1892, which noted: 'The Silverton Company have renovated and reconstructed a portion of the old Martha battery, which they are fitting up with all the latest appliances, and, as their mine has the appearance of being a very good one, they should have a very bright future before them.'[71] Pan amalgamation was trialled by the Silverton Company with little success; however, their adoption of the Cassel cyanide process in 1893 led the way for extraction development throughout Waihi.[72]

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[62] Sources consulted for this project variously refer to the company as the Waihi Company and the Waihi Goldmining Company.
[63] Clough 2004, pp.26-27; McAra 1988, p.50. In reference to the Waihi Battery, the annual government mining report for the year ending March 1890 stated: 'The claimholders are anxiously looking forward to see if the plant erected by the Waihi Gold- and Silver-mining Company is going to be a success. The first plant erected by this company has been partially dismantled—that is, the rolls and Globe mills have been taken down, and a thirty-head stamping-battery erected instead. The battery is of American pattern; the stamps are 9001b., each, and work remarkably well.' AJHR 1890 C-03, p.40.
[64] Climie 1962, p.48.
[65] AJHR 1888 C-05, p.27.
[66] Climie 1962, p.46; AJHR 1889 C-02, p.43.
[67] McAra 1988, p.49.
[68] Ibid.; Climie 1962, p.48; AJHR 1891 Session II C-04, p.40.
[69] McAra 1988, p.49; Clough, 2004, pp.18-19.
[70] AJHR 1892 C-03A, p.6; Lens, 2017, p.4.
[71] AJHR 1892 C-03A, p.6.
[72] Lens 2017, p.4.

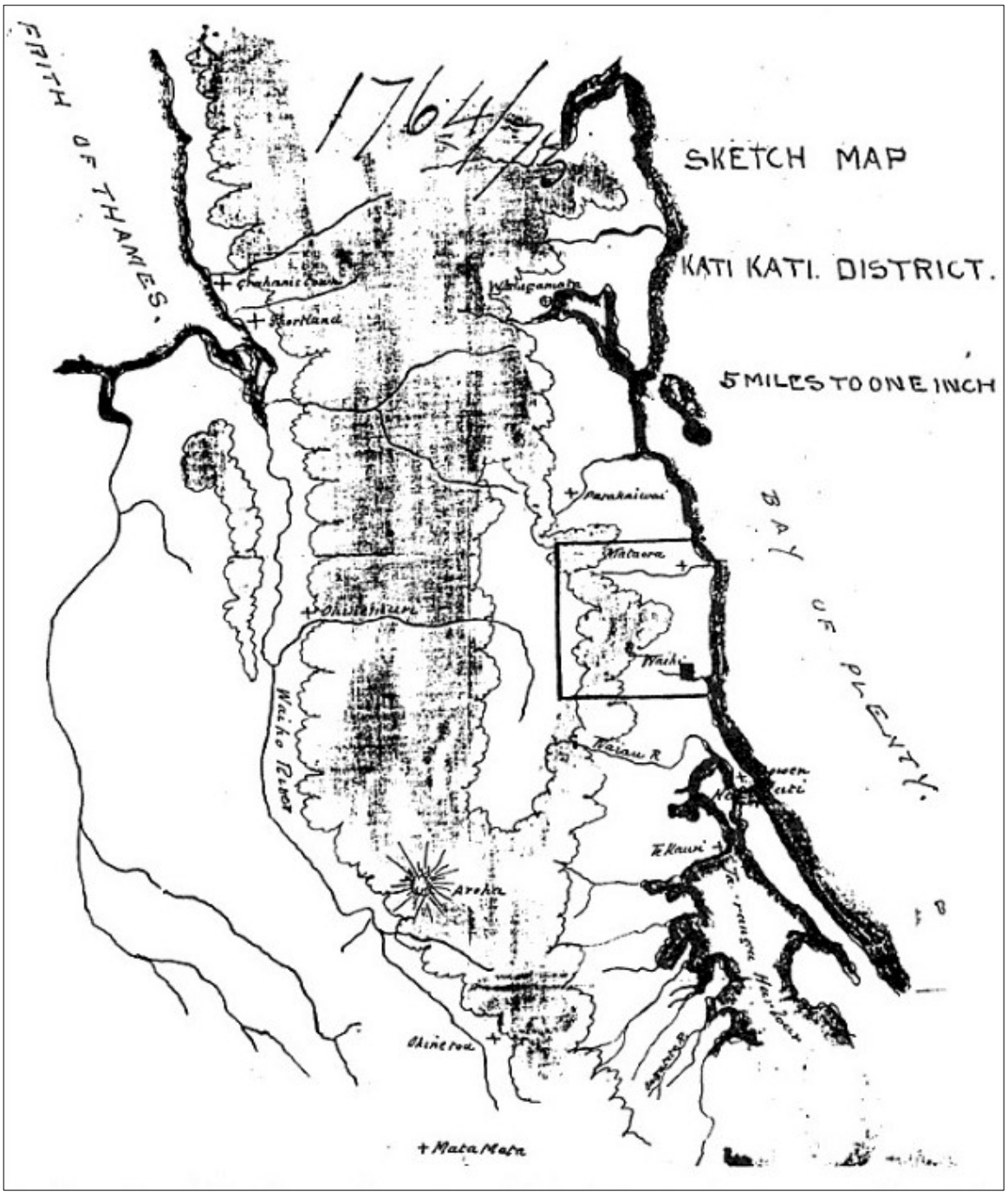

Figure 8. Sketch plan drawn by Jonathan Brown, dated c.1870, showing the area of his party's applied-for prospecting claim which possibly included the site of present day Waihi and Martha (Pukewa) Hill (source: Moore 1999)

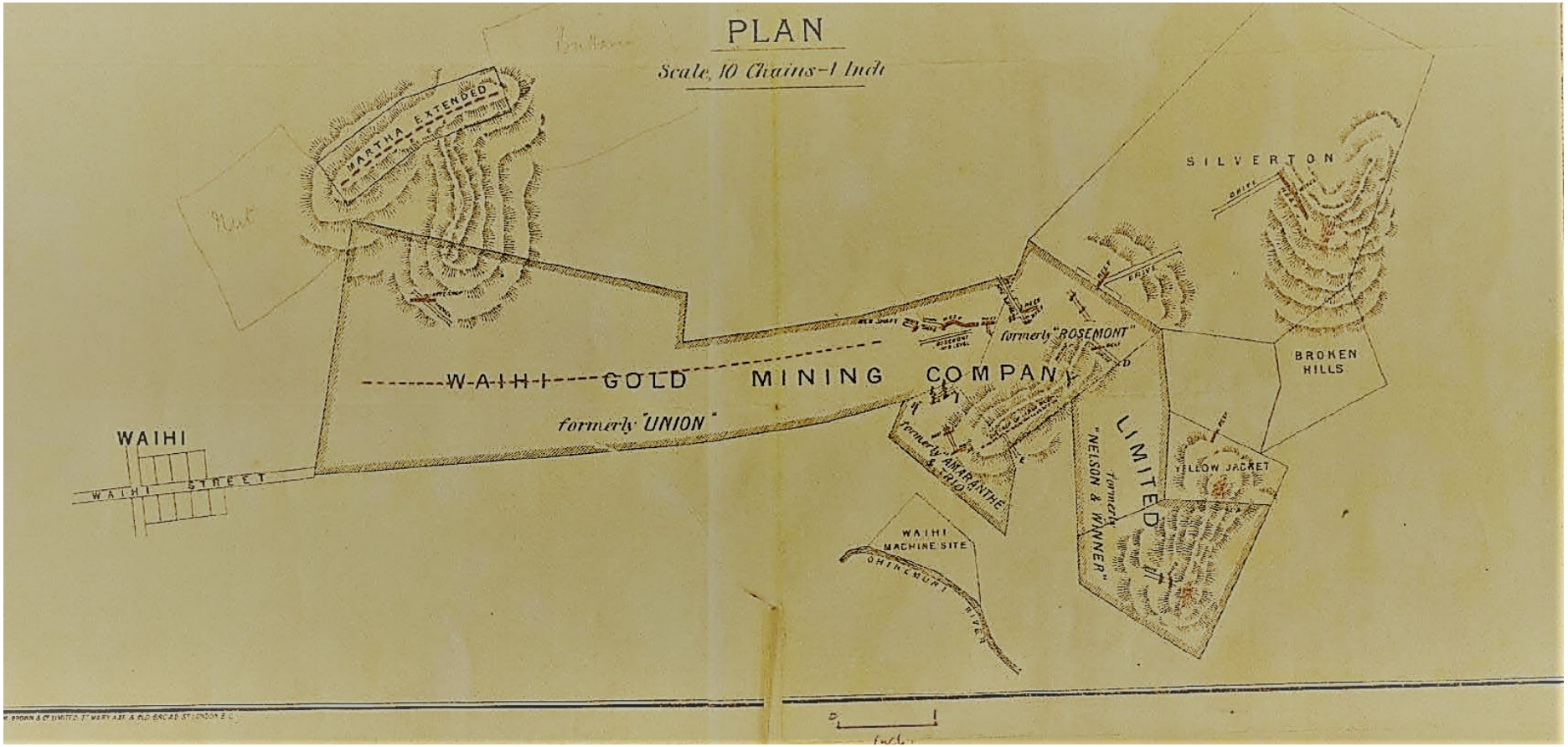

Figure 9. Mine plan, dated c.1888, showing early drives and shafts on the Martha, Union-Rosemont-Amaranth, Silverton and Winner reefs (source: 1888d. Vol 56, Book of Prints, WGMCR Waihi Gold Mining Company Records, Auckland War Memorial Museum Library)

Extraction Advances and Development, 1893-1901

Despite improvements in amalgamation processes throughout the late 19th century, recovery percentages remained low. From 1889 trials of gold extraction using potassium cyanide were undertaken in Karangahake by the Cassel Company, and the results significantly altered methods of extraction across the Ohinemuri goldfield.[73] According to P. Rainer:

> 'The MacArthur-Forrest process had been patented in Glasgow during 1887, and the patent purchased by the Cassel Gold Extracting Company. It dealt with the precipitation of the gold from the crushed quartz, which up to then had been done by pan amalgamation. The new process was very simple. Ore was crushed by the stampers into an exceedingly fine state, before being passed on as a powder to circulate through tanks containing a weak solution of potassium cyanide – which had an affinity for gold. The cyanide brought the gold into solution without affecting the rock particles (or more accurately rock pulp), which could be easily drained off. The solution containing the dissolved gold was then passed over zinc shavings: the zinc replaced the gold in solution, resulting in a black sludge called 'black slimes' which were then refined.'[74]

Tests with cyanide were made by the Waihi Goldmining Company as early as 1891 using the Bohm process, although all proved unsuccessful.[75] The Silverton Company were the first in Waihi to fully utilise the Cassel extraction method from April 1893 and the Waihi Company soon followed, with a cyanide plant completed at the Waihi Battery by May 1894.[76] The plant proved highly suitable for processing Waihi ores, where the gold naturally occurred in a very fine state, and rendered pan amalgamation obsolete.[77] The new methods saw extraction for gold rise to 90% of the assay value, compared with 66% from pan amalgamation, and about 50% for silver, up from 35%.[78] In subsequent years further refinements increased this to as much as 96% for gold.[79]

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[73] AJHR 1890 C-03, p.30; *Thames Star*, 2 May 1889, p.2; *Thames Advertiser*, 28 September 1889, p.2.
[74] P. Rainer, Company Town: *An industrial history of the Waihi Gold Mining Company Limited, 1887-1912*, np, 1976, np; Clough 2004, p.65.
[75] AJHR 1892 C-03A, p.6; AJHR 1893 C-03, p.69.
[76] Lens 2017, p.55; Clough 2004, p.66. Note: around early 1893 the Cassel Company also erected a tailings plant at the Waihi Battery to rework the tailings accumulated between 1888 and 1892 from the pan amalgamation process. The undertaking was mentioned in the annual warden's report, for the year ending March 1894, on the Waihi Goldfield: 'Cassel's Company's Works — This company has erected suitable plant for treatment of the tailings and slimes which have accumulated at the Waihi Company's works. These tailings, estimated at from 25,000 to 30,000 tons, were purchased from the Waihi Company for £5,000 early in last year. Advantage was taken of the fine weather to get the materials on the ground and erect the buildings and necessary vats and machinery. water-race was constructed to bring in water from the creek receiving water from the swamp, and also that flowing from the adit-level of the Waihi Mine. The plant is situated near the river, and below the place where the tailings are deposited. The cost of the plant, Mr. James, the company's manager, informed me, was about £2,500. The first month's run was very satisfactory 1,425 tons of tailings were run through for 1,1260z. of bullion, worth £1,500. The number of men employed is two laboratory men, two cyanide plant men, seven contractors to deliver tailings, one carpenter, one labourer, and the manager: total, fourteen men.' AJHR 1894 C-03A, p.13.
[77] Clough 2004, p.66.
[78] McAra 1988, p.89.
[79] Clough 2004, p.66.

The Silverton mine, including the battery, was taken over by the Waihi-Silverton Company in 1895.[80] The new company was floated in Glasgow by a former representative of the Cassel Company, Mr Melville, and by March 1895 the annual report of the Waihi goldfield noted:

> 'The Silverton Company had a crushing-battery at the side of the Ohinemuri River, which formerly belonged to the Martha Company; but it is one of the very old type, and not suitable for dry-crushing. Mr. Adams, the manager, who was formerly at Waiorongomai, has now received instructions to prepare plans and specifications and call tenders for a reduction plant of twenty heads of stamps, together with complete cyanide plant, and tables covered with copper-plates coated with quicksilver. An engine and pumping plant is also to be erected; but the present shaft is too small for winding and pumping, and commencement will be made to enlarge it as soon as the water is pumped out. Recently the company has purchased the engine and boiler which formerly belonged to the Red Mercury Company at Kuaotunu, and intend to use it for pumping.'[81]

The Silverton Battery was subsequently refurbished and the power supply upgraded.[82] Cyanide vats made of steel plates were also constructed at the site and the upgraded 40 stamp battery was described by the *Auckland Star* as 'perhaps the most important development in mining which has taken place in the past twelve months in the Upper Thames'.[83]

Expansion of the Waihi mines continued from the mid-1890s (Figure 10 to Figure 11). In 1894/1895 the Union-Waihi Gold Mining Company, a subsidiary of the Waihi Gold and Silver Mining Company, was formed to mine the Union-Rosemont-Amaranth section.[84] The Union-Waihi Company was restructured in 1895, with 100,000 shares held by the Waihi Company and 1250 shares by the Cassel Company for the use of the cyanide process.[85] The newly formed company held a total area of 346 acres, including the Amaranth, Rosemont, Golden Run, and Union Special claims.[86] Mining had commenced at Union Hill by 1896, although the company was not permitted to use the nearby Waihi Battery for processing.[87]

To the east of Union Hill, mining on Gladstone Hill (NZAA T13/821) was steadily advanced. Gladstone Mine was mentioned in parliamentary papers from 1891/1892 and was noted to contain 30 acres, owned by Wood and party, through which a prospecting drive had been cut 'and a reef cut 7ft in thickness, the value of which has not been ascertained'.[88] By 1894 the ownership of the mine had been transferred to H. Brett and party and it was stated that 'very little prospecting was done during the year, and the licensed holding is to be forfeited'.[89] A new company, known as the Waihi Gladstone Company, was set up in 1896 to work the Gladstone, Joker and Salisbury claims with a

[80] Lens 2017, p.56.
[81] AJHR 1895 C-03, p.64.
[82] Lens 2017, p.4.
[83] AJHR 1896 C-03, p.70; *Auckland Star,* 7 April 1896, p.5.
[84] Clough 2004, p.14; McAra 1988, p.51.
[85] Clough 2004, p.14; McAra 1988, p.97.
[86] Lens 2017, p.63.
[87] Ibid.
[88] AJHR 1892 C-03A, p.15.
[89] AJHR 1894 C-03A, p.13.

capital of £100,000 (Figure 12).[90] The company progressed works and by 1898 nine miners were employed and 'a shaft 6ft. by 3ft. was sunk to depth of 175ft., a level was opened at 100ft. down, and 200ft. of driving was done on a reef 6ft. in width; winze was also sunk on this reef, the quartz improving in quality as sinking progressed.'[91] Work carried on at the mine until the turn of the century; however, by 1901 operations had been confined to the No. 3 level main reef.[92]

Between 1895 and 1898 the Favona shaft (NZAA T13/306) was sunk to the north of Silverton Hill (NZAA T13/819).[93] In April 1895 the *Thames Advertiser* reported that 'Charlie McLean is prospecting on the Favona, and has cut several grand leaders…As Charlie is an old Thames man, and as good as ever broke bread, it is to be hoped he will retire to your city with something "up his sleeve" or at his Bank account which will stand a few "doch in doris".'[94] The following year the claim was taken over by the Favona Brilliant Gold Mining Company, which was successfully floated in London with a capital of £200,000.[95] An initial shaft was excavated to a depth of 70ft and later extended to 310ft after the mine was amalgamated into the Waihi Consolidated Gold Mining Company in 1897.[96] A summary of the company's holding was provided by the *New Zealand Herald* in August 1897:

> 'WAIHI CONSOLIDATED. The property consists of the mines known as the Favona, Brilliant, and Martha United, and is bounded by the Silverton on the south, Waitete on the east and north, Ohinemuri on the north, and Grand Junction on the west. The company was formed about two years ago, and the first work undertaken was the sinking of a shaft which was put down 90 feet. At the 70-feet level a crosscut was put in and a large reef cut. The quartz was of poor quality, containing gold, but not in anything like payable quantities, the best assay running up to 32s per ton. It was anticipated that the reef would improve at a depth, and sinking was resumed, the shaft now being down 217 feet, and still on quartz. At the present time a chamber is being excavated for the cistern, while the plunger and mains will soon be in position. A crosscut at 200 feet will be commenced east and west. The lode mentioned is distinct altogether from the Silverton reefs. The machinery has been erected under the supervision of Mr. Milner, and the whole plant will shortly be in proper working order. The machinery consists of a Tangye winding engine, 25 horse power, driven by a 16 feet by 6 feet multitubular boiler. The pumping engine is of 260 horse power, the plunger having a 12-inch lift, making 26 strokes to the minute, and capable of lifting 24,000 gallons per hour, when being driven at a low rate of speed. The pumping engine has a tenton fly-wheel, and the engine has been set on 16 feet of concrete. Under the supervision of Messrs. Milner and Chas. McLean (the mine manager) work is being expeditiously carried on, and it is expected that pumping will be commenced in a few weeks' time.'[97]

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[90] *Feilding Star*¸ 4 June 1896, p.2.
[91] AJHR 1898 C-03, p.70.
[92] AJHR 1901 C-03, p.56.
[93] NZAA Site Record T13/306.
[94] *Thames Advertiser*¸ 1 April 1895, p.3.
[95] *Auckland Star*, 20 March 1896, p.3.
[96] NZAA Site Record T13/306.
[97] *New Zealand Herald*¸ 16 August 1897, p.5.

Work continued at Favona until around 1899, when the company's funds were exhausted. The mine was taken over by the Waihi Syndicate Ltd, although progress at Favona was stalled until after 1900.[98]

Situated roughly east and west of Martha Mine were the claims of the Grand Junction Company.[99] Workings at the Grand Junction were recorded in the annual goldfields reports from 1891 to 1892, which stated: 'Attempts have been made to sink shafts by the owners of the Waitete on the south-west end, and the Grand Junction on the north-east end, of the Martha section, but from the quantity of water found it will be necessary to provide pumping-appliances in both shafts.'[100] The original Grand Junction Company was founded by Thames mining expert J.W. 'Long Drive' Walker, who floated the concern in London in 1894.[101] The company controlled the Grand Junction mine (of around 90 acres) to the east of the Martha lode and the Waihi West mine (formerly Waitete West, also 90 acres), to the west. Diamond drilling machinery from London was utilised by the company from 1894; however, no bullion was recovered by these early workings.[102] An English company took over the holdings of the Junction Company in 1897, and registered itself under the same name. Walker retained interests in the company and was employed as manager of the mine throughout 1899.[103] Considerable development of the Waihi Grand Junction mines took place from 1897, although profitable returns were not realised by the company until after 1900.[104]

Further development of the mines worked by the Waihi Gold and Silver Mining Company continued apace around the turn of the century. By the mid-1890s the company had become the largest gold producer in New Zealand and their success led to the construction of a new battery at Waikino in 1897, known as the Victoria Battery.[105] The company expanded its holdings by re-acquiring the properties of the Union-Waihi Gold Mining Company in 1901. These included the Silverton mine, which had been purchased in 1898, along with the Silverton Battery (renamed the Union Battery).[106] Advances in heavy pumping gear at the end of the 1890s aided large-scale production and the conversion of the Union and Waihi Batteries to wet crushing allowed a greater percentage of both gold and silver to be recovered from the ore (Figure 13 and Figure 14).[107] In 1900 construction began on a railway line to connect Waihi with the government railway system (Paeroa-Waihi). The project assured development for Waihi mining companies and ushered in a phase of boom prosperity.[108]

[98] NZAA Site Record T13/306.
[99] See NZAA Site Records T13/313, T13/314 and T13/315.
[100] AJHR 1892 C-03A, p.15.
[101] Climie 1962, p.52; *Thames Star*, 17 May 1894, p.2.
[102] McAra 1988, p.99; Climie, 1962, p.52.
[103] Climie 1962, p.52.
[104] Ibid.
[105] Barber 1985, p.38.
[106] Clough 2004, p.14; AJHR 1900 C-03, p.89.
[107] McAra 1988, pp.26 & 126.
[108] Climie 1962, p.83.

Figure 10. Plan of the Ohinemuri goldfield, dated c.1890s, identifying the various mining claims across the area (source: Sir George Grey Special Collections, NZ Map 4328)

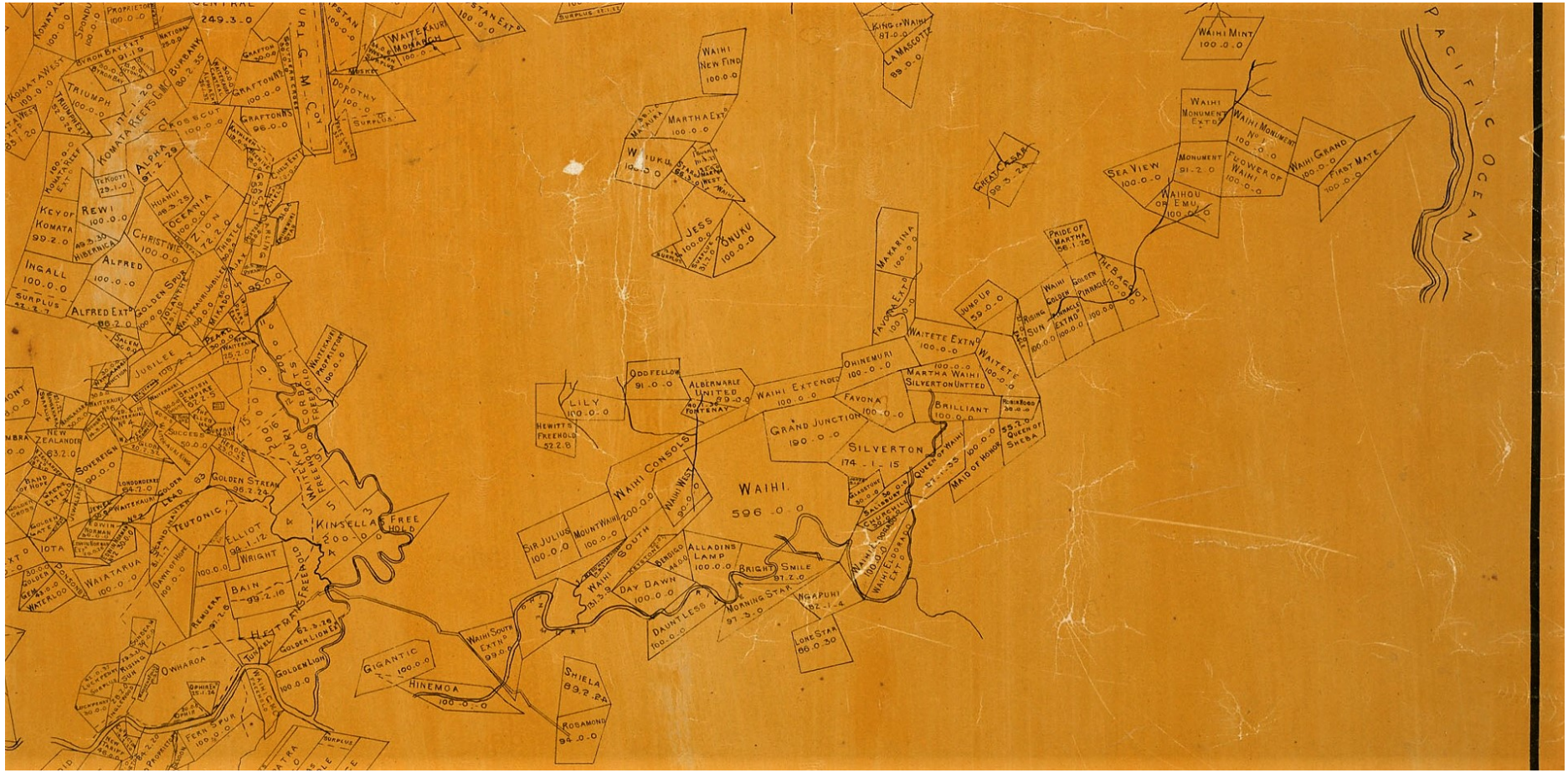

Figure 11. Close-up of plan of the Ohinemuri goldfield, dated c.1890s, showing mining claims within the Waihi area (source: Sir George Grey Special Collections, NZ Map 4328)

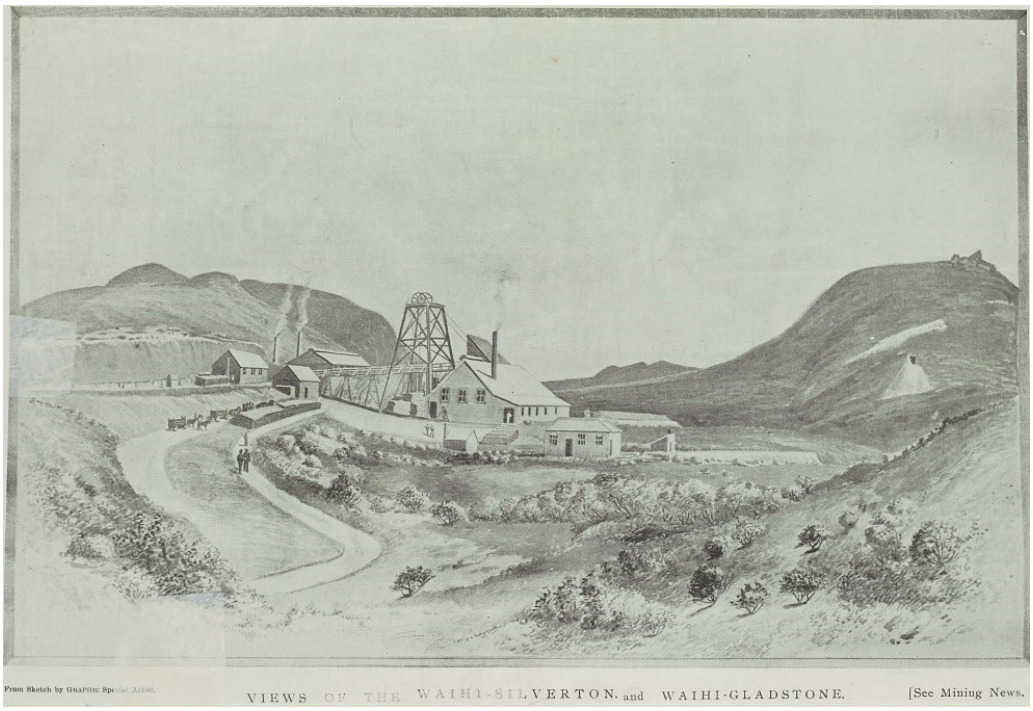

Figure 12. Sketch drawing, dated 11 July 1896, showing views of the Silverton and Gladstone Hills in Waihi with mining buildings in the foreground (source: Sir George Grey Special Collections, Auckland Libraries, NZG-18960711-40-1)

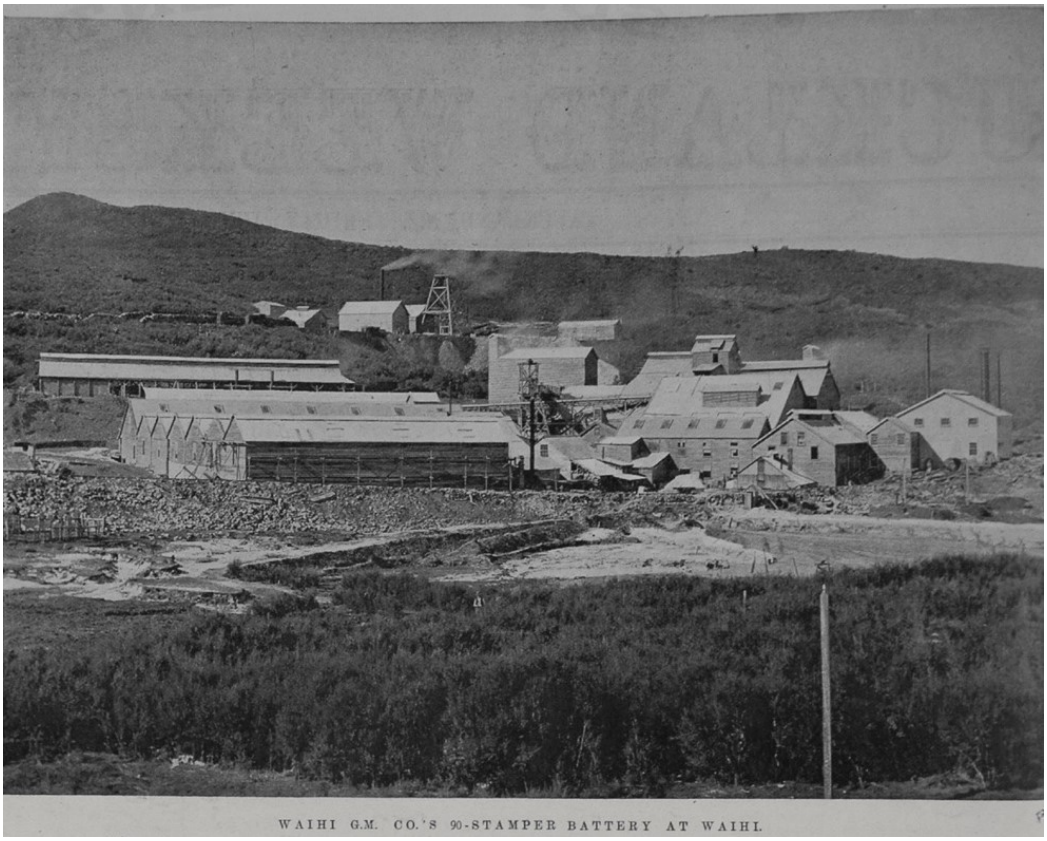

Figure 13. Photograph, dated 9 June 1899, showing the Waihi Gold and Silver Mining Company's 90 stamper Waihi Battery (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-18990609-2-1)

Figure 14. Photograph, dated 29 August 1901, showing the Waihi Gold Mine, with poppet heads at the company's shaft, and Martha Hill visible (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19010829-6-2)

Boom Years, 1902-1910

The Waihi goldfield experienced a boom period during the early 20th century which saw increased production and expanded operations (Figure 15 to Figure 17). By 1902 the Waihi Gold Mining Company had 330 stamps in use (including the 200 stamps at the Victoria Battery) (Figure 18 to Figure 20) and J.B. McAra notes:

> 'After the change to wet crushing the Waihi Company went from strength to strength, with constantly increasing ore reserves and improvements in the ore-treatment process, while still following the basic pattern already established. Annual production of 214,508 tons valued at £603,167 for 1903 advanced to 416,813 tons valued at £959,594 for 1909 – this marked the all-time peak of the mine's production and set its place securely amongst the world's great gold-producers, probably the first ten.'[109]

A large winding plant was erected by the Waihi Company at the No. 1 Shaft (Martha Mine) in 1903 and that same year construction began on a pumping plant at No. 5 Shaft which was said to be capable of 'unwatering the mine to a depth of 3,000ft.'[110] The 'C' Cornish pump was housed in a sizeable concrete building which stood on the site of the No. 5 Shaft and was alternatively known as the Martha Mine No. 5 Pumphouse (NZAA T13/301) (Figure 21 and Figure 22). It was one of only two such buildings erected in New Zealand, the other located at the copper mine on Kawau Island.[111] The installation of the pumping equipment cost the Waihi Company £130,000 and an initial trial of the machinery was reported by the *New Zealand Herald* in April 1904:

> 'The large Cornish pump installed at No. 5 level of the Waihi Gold Mining Company's mine had a short test this afternoon in the presence of several officials of the company. The machinery was set in motion by Mr. F. Roche, who is responsible for the expeditious installation of what is believed to be the finest pumping plant in the Australasian colonies. The pump was only running about two strokes a minute, and was lifting a tremendous volume of water at each stroke from a depth of 700ft. when an unfortunate mishap occurred down the shaft, one of the large pipes having burst with the pressure. The pipe will have to be replaced before a proper trial of the plant can be completed, but there is no doubt, judging by the short initial run to-day that the machinery will do all the work expected of it, and that the company will have no water difficulty to contend with in their deep level operations. The exploitation of the deeper levels is, I understand, to be undertaken immediately. One of the first steps will be the sinking of the No. 5 shaft.'[112]

The pump was successfully operating by the end of 1904 and was mentioned in the report of John Hayes, the Inspecting Engineer to the Minister of Mines:

> 'At the [Waihi Gold Mining Company's] mine the erection of the large new pumping plant (referred to in last report) has been completed, and is successfully at work. A new pair of winding-engines, having cylinders 18in. diameter by 3ft stroke geared 2 to 1 to a drum 9ft. in diameter, have been erected at No. 1 shaft. This

[109] McAra 1988, p.128.
[110] AJHR 1904 C-03, p.41.
[111] Salmond Reed Architects. November 2003. Martha Mine Pumphouse, No. 5 Shaft Waihi. A Conservation Plan. Prepared for Newmont Waihi, p.17.
[112] *New Zealand Herald*¸ 14 April 1904, p.6.

> increase of pumping and winding power will enable the management to further develop the property to a considerable extent.'[113]

1904 was also a year of expansion for the Grand Junction Company, who conducted exploratory works and discovered a large body of quartz.[114] That same year the company purchased a relatively new 40 stamp battery and cyanide plant, formerly belonging to the Kauri Freehold Gold Estate Company, who operated Opitonui Mine near Coromandel.[115] The battery (NZAA T13/312) was relocated to the hillside above the Grand Junction Company's main shaft, although was not operational until 1906 (Figure 23).[116] In addition to the new Grand Junction Battery, machinery in and about the mine was significantly overhauled from 1904.[117] The buildings and plant were enlarged and by 1906 the company had expended around £218,000 on mine development (Figure 24 to Figure 26).[118] Improvements included the construction of a power-plant (NZAA T13/313) which McAra notes: '…was particularly well-designed; the first part of it, completed in 1905, was housed in a building 98 feet by 50 feet, divided into a boiler-house and an engine-room. The steam-generating equipment consisted of three Babcock & Wilcox, two-drum, water-tube boilers…the working pressure of the boilers being 200 pounds a square inch.'[119] The plant was thought to be 'one of the most elaborate steam-power plants of its type at [the] time' and was later improved by the installation of an A.E.G. steam turbine in 1913 (Figure 27).[120]

Modest expansion within smaller companies, such as the Waihi-Gladstone, also occurred during the boom years of the Waihi goldfield. From 1903 to 1904 the Gladstone Battery was erected on the northern side of Gladstone Hill (NZAA T13/821), adjacent to the Gladstone Company's shaft.[121] The battery comprised five stamps and was first trialled in October 1904.[122] Initial processing was done by plate amalgamation, although the battery was converted to cyanide methods in 1905.[123] Work continued at the Gladstone mine throughout the early 1900s; however, by 1908 the Inspector of Mines noted:

> 'The company have done a considerable amount of prospecting, but with very little success. A crosscut was driven a distance of 400ft. at the No. 2 level 200ft., making a total distance of 600ft. from the shaft. Several ore-bodies were cut through, but they yielded unremunerative values. The last lode cut is 13ft. wide, but the ore proving poor in this place, and the ventilation being indifferent, further prospecting

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[113] AJHR 1905 C-03, p.3.
[114] Ibid., p.4.
[115] Ibid.; McAra 1988, p.130; Climie 1962, p.52.
[116] Ibid.; NZAA site record T13/312.
[117] AJHR 1905 C-03, p.4.
[118] Climie 1962, p.52.
[119] McAra 1988, p.144.
[120] Ibid., pp.144-145. Note: A.E.G. stands for Allemeine Elecktritats Gesellschaft, Berlin, NZAA site record T13/313.
[121] Eric Lens, 2004 research entitled 'Waihi Gladstone Battery', accessed via: http://www.ohinemuri.org.nz/research/waihi-gladstone-battery/1894-waihi-gladstone-battery
[122] Ibid, *Waihi Daily Telegraph*, 29 October 1904, p.3.
[123] Eric Lens, 2004 research entitled 'Waihi Gladstone Battery', accessed via: http://www.ohinemuri.org.nz/research/waihi-gladstone-battery/1894-waihi-gladstone-battery

> on the lode was postponed for time. The work was done by contract, and an average of four men were employed.'[124]

Further to the north, a new shaft at Favona was driven by the Waihi Consolidated Gold Mining Company from 1905.[125] Progress was summarised in the 1907 parliamentary papers with the following:

> 'The syndicate having an option over this property commenced sinking a prospecting-shaft in the last week of 1905. This shaft (11ft. by 6ft. in the clear) has up to 31st December, 1906, been sunk to depth of 395ft. From the surface down to 314ft. the shaft was good sinking, being mainly in pumice sediment; from that point to present depth stratum of boulders is being penetrated, which has retarded progress and gives a lot of water. Two 16ft. by 6ft. multitubular boilers have been installed, the last one in October, the pumping plant being a 5,000-gallons-an-hour Tangye in the bottom, and 1,200-gallons-an-hour Worthington at 250ft. lodgments. The winding-engine consists of a pair of 10ft. cylinders, with 18in. stroke, and is of ample power for extent of intended operations. The intention of the syndicate is to carry the shaft down to 800ft. or over before opening out for crosscutting, provided ore is not struck in the sinking. The average number of men employed during the year was twenty-one.'[126]

Several other syndicates continued to work the profitable reefs during the early 1900s; however, none came close to matching the production levels of the Waihi Gold and Silver Mining Company. In the 1910 report of the company's chairman, A.M. Mitchelson, it was stated that 'the increase in our yield, coupled to the decrease in our expenses and a little more interest received, has resulted in the gross profit amounting to £606,182, which I think you will agree, is a very satisfactory result.'[127] The company's mine was regarded as 'the most-important gold-mine in Australasia, and one of the greatest gold-mines in the world' and confidence in the continuing upward trends of the mine remained high.[128] However, 1909-1910 marked the end of the boom period for the Waihi goldfield and the start of a phase of long-term stability for the area.

[124] AJHR 1908 C-03, p.15.
[125] NZAA site record T13/306.
[126] AJHR 1908 C-03, p.12.
[127] McAra 1988, p.147.
[128] AJHR 1910 C-03, p.5; Climie 1962, p.55.

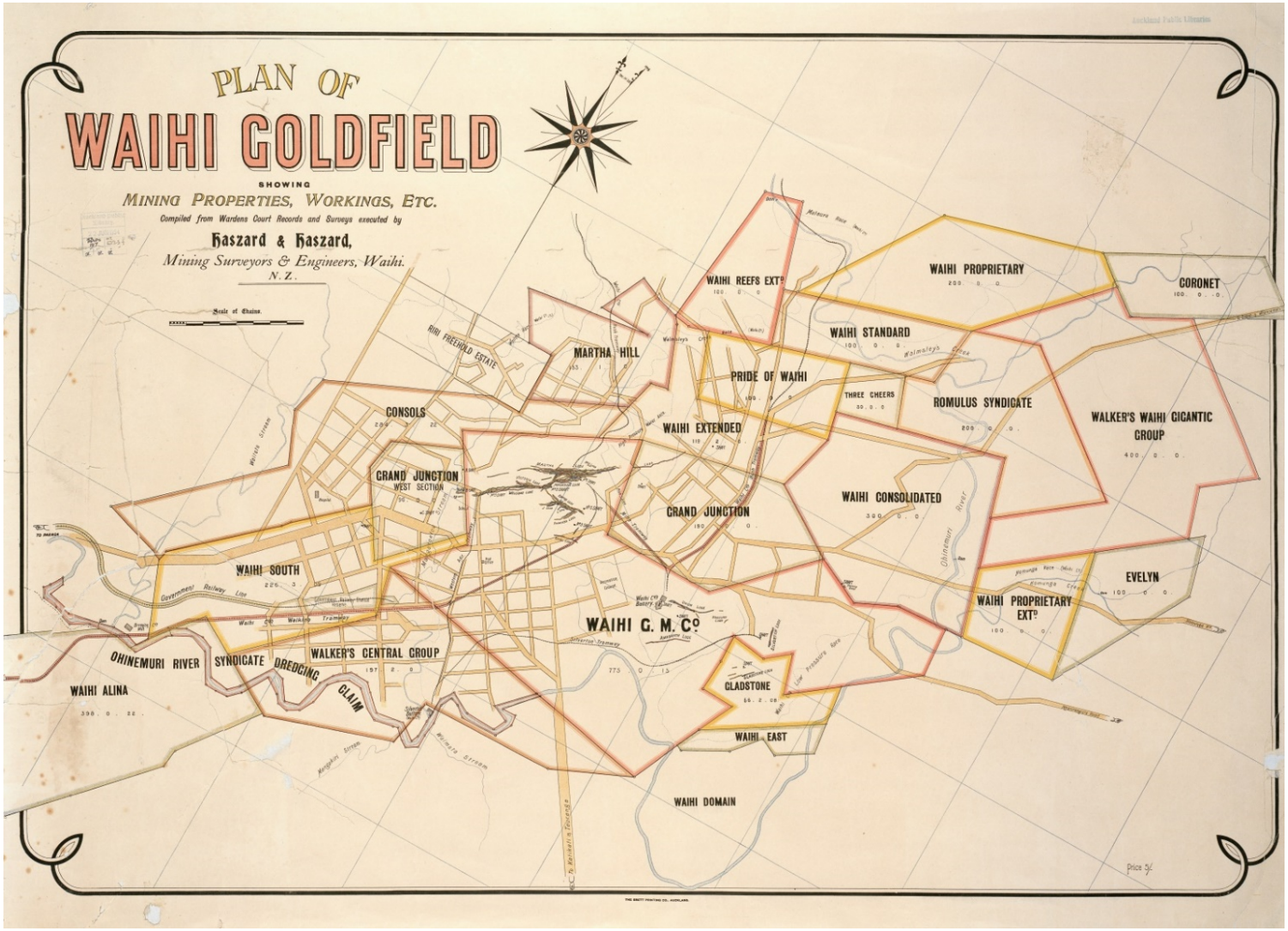


Figure 15. Undated plan (possibly early 1900s) of the Waihi Goldfield showing the various claims across the area (source: Sir George Grey Special Collections, NZ Map 197)

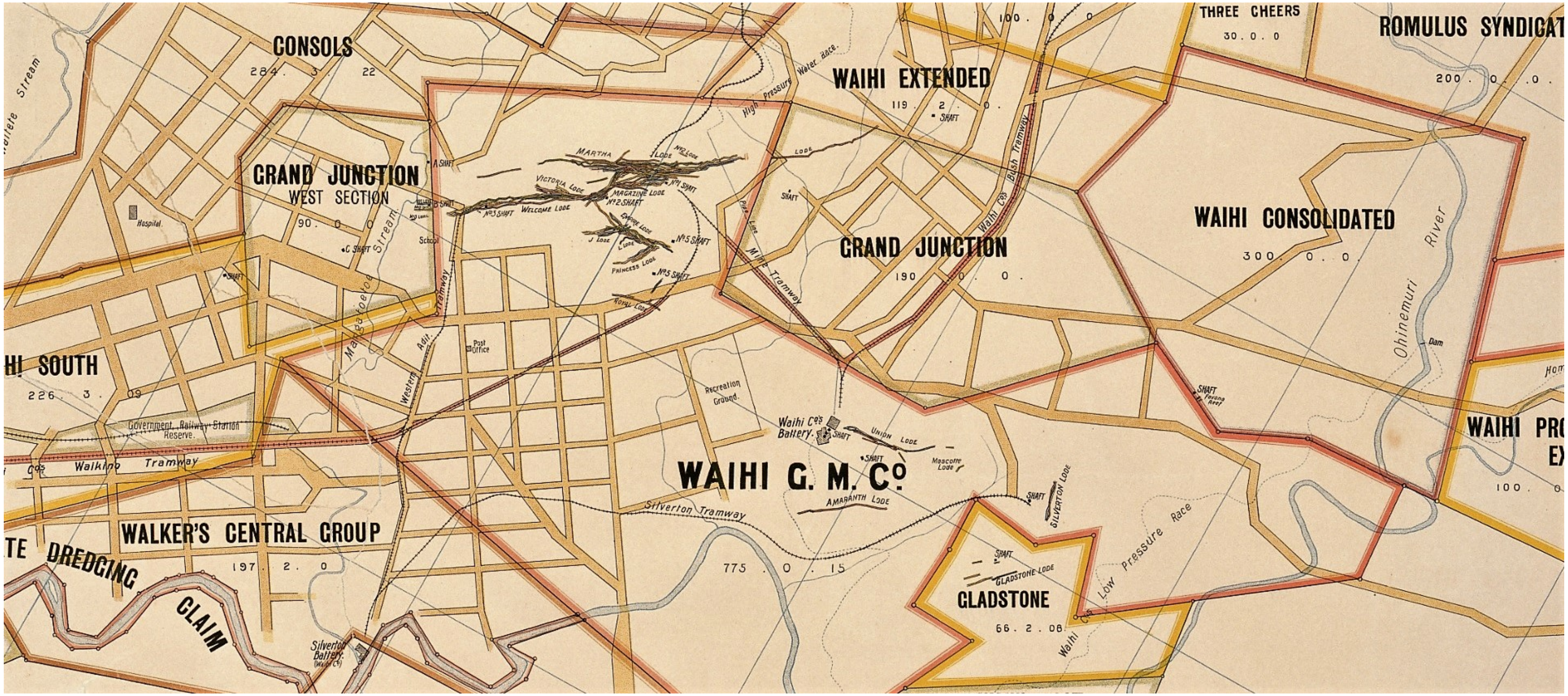


Figure 16. Close-up of undated plan (possibly early 1900s) of the Waihi Goldfield showing the various claims across the area (source: Sir George Grey Special Collections, NZ Map 197)

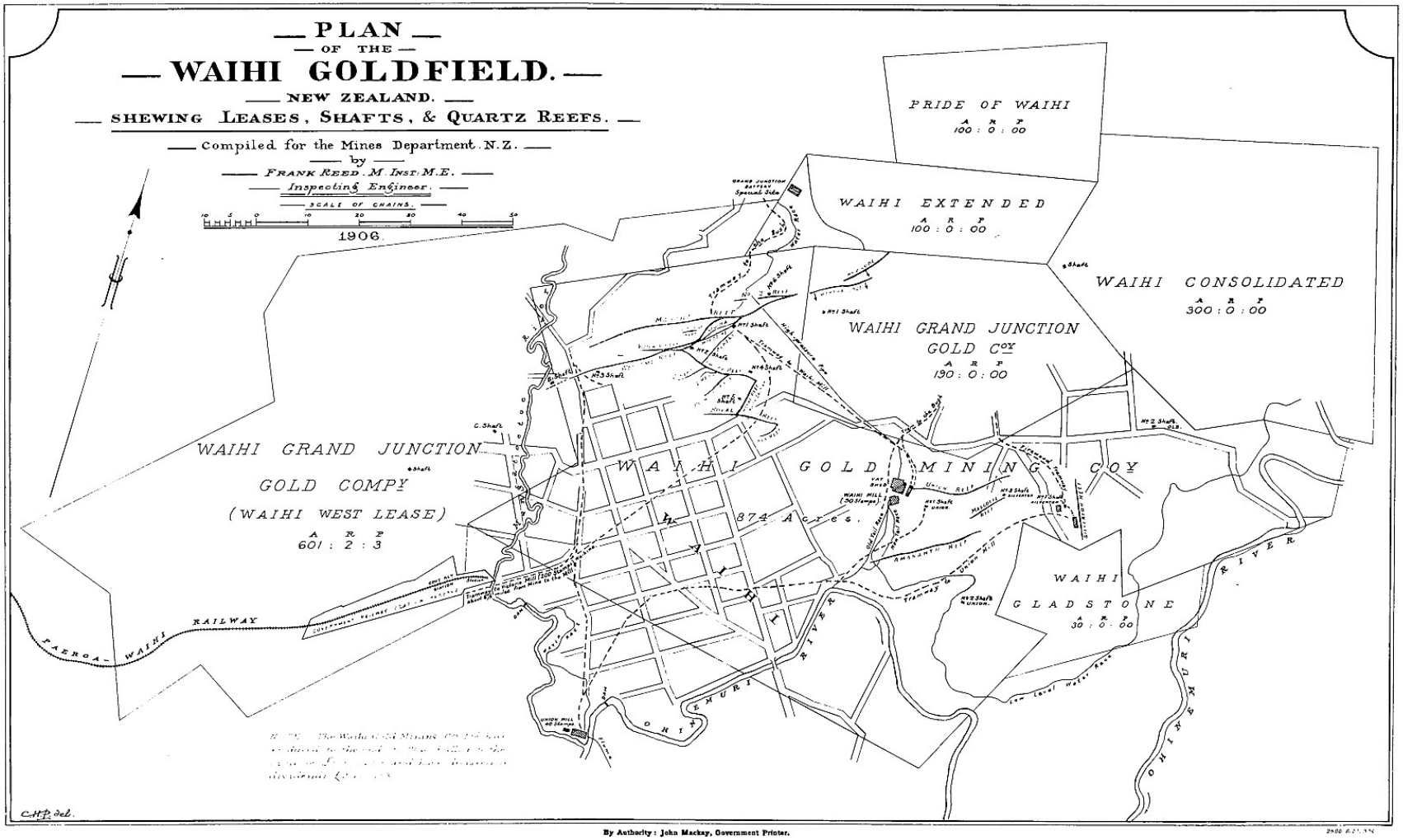
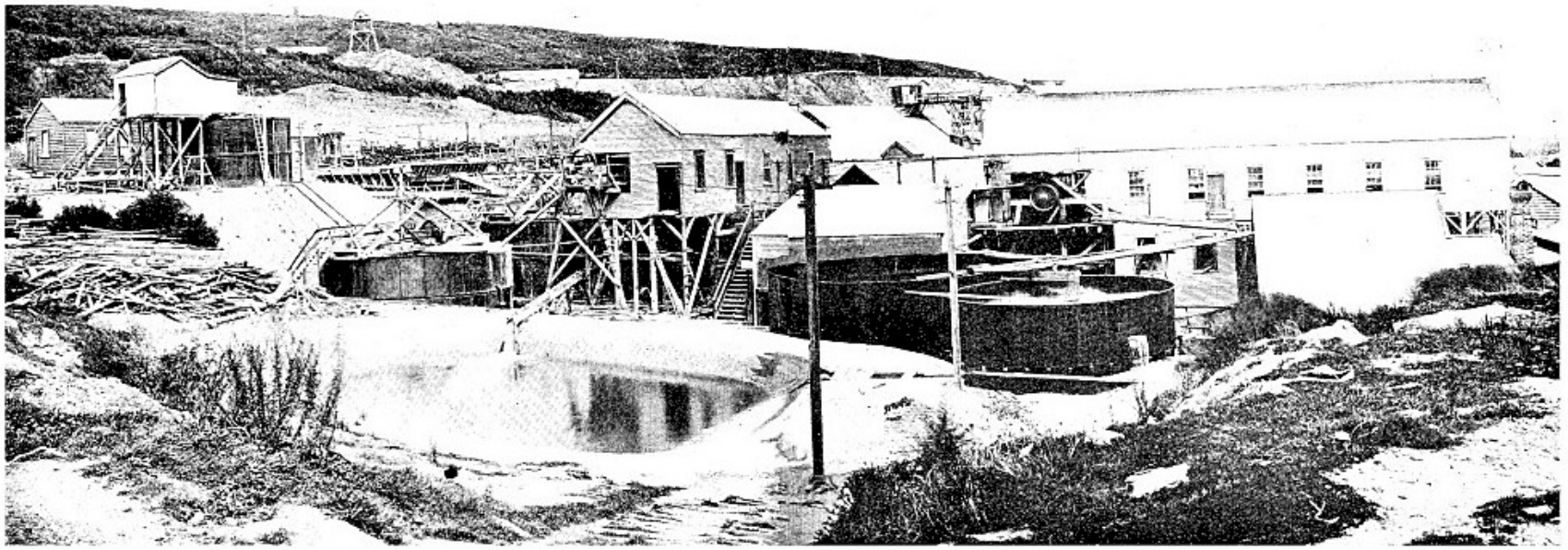


Figure 17. Plan of the Waihi Goldfield, dated 1906, showing leases, shafts and quartz reefs (source: AJHR 1907 C-03: np)



Face p. 85.] General View of Waihi Gold mining Company's 90-stamp Mill and Cyanide Plant at Waihi: Battery-water Reservoir, Settlers, Press Buildings, Agitators, and Solution Tanks in the foreground C.—3.

Figure 18. Photograph, dated c.1902-1903, showing the Waihi Gold and Silver Mining Company's Battery and Cyanide Plant. Note: Battery-water Reservoir, Settlers, Press Buildings, Agitators, and Solution Tanks in the foreground (source: AJHR 1903 C03: np)

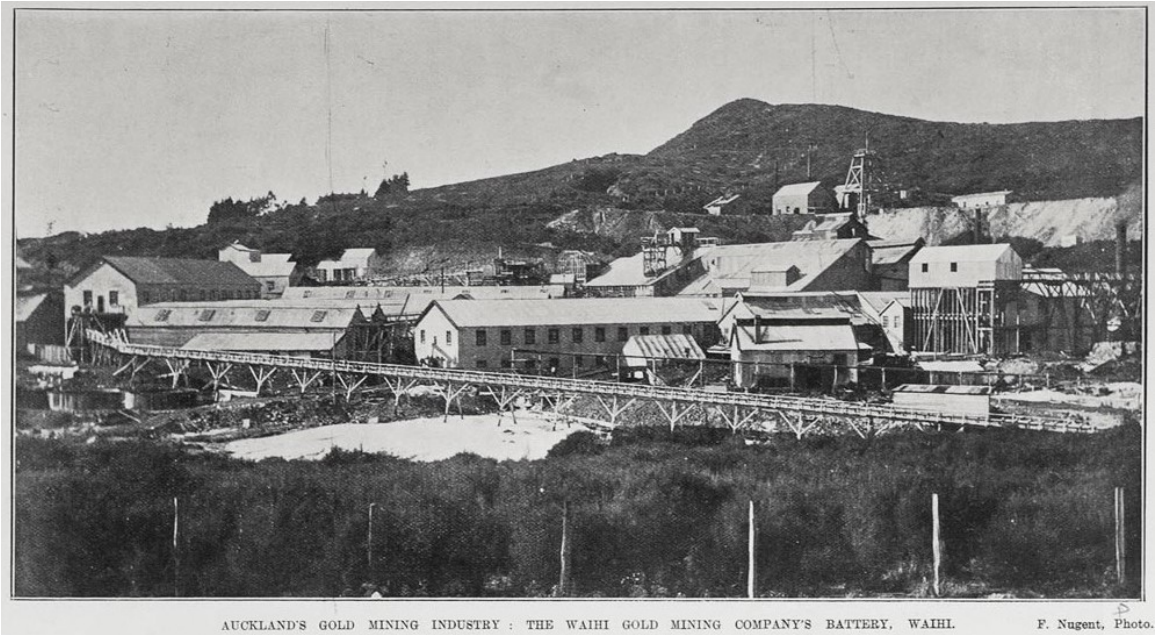


Figure 19. Photograph, dated 18 August 1904, showing the Waihi Gold and Silver Mining Company's Battery and Cyanide Plant (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19040818-7-1)

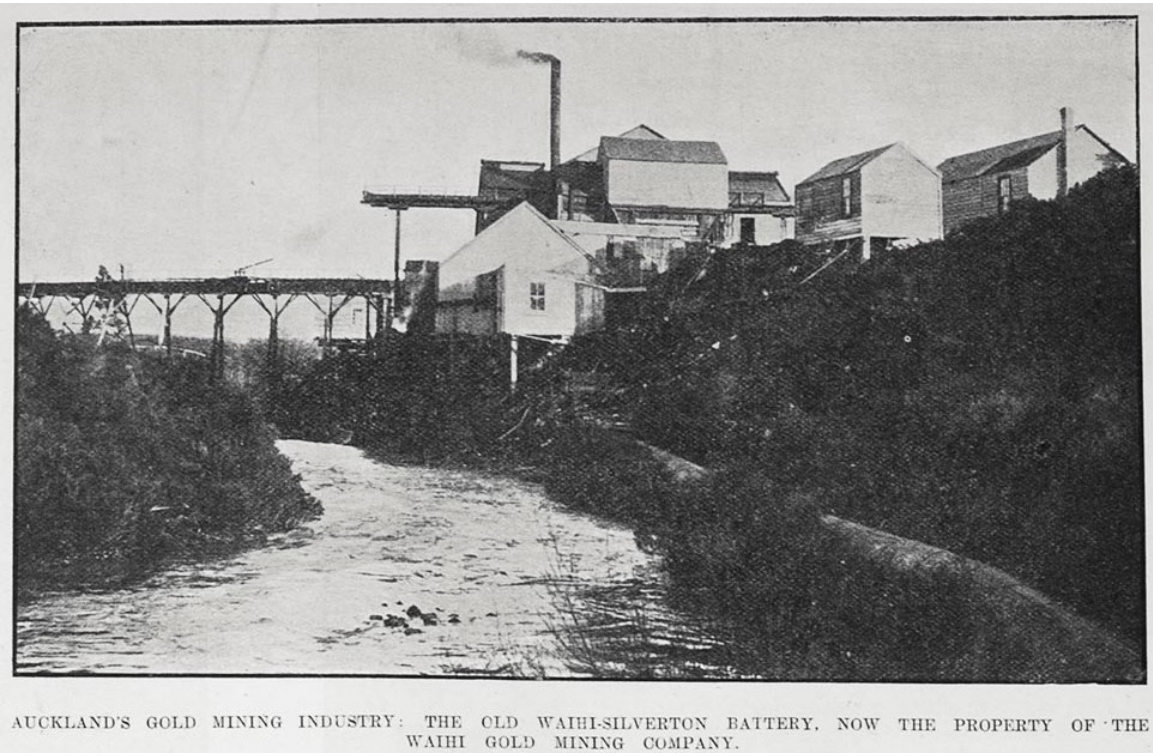


Figure 20. Photograph, dated 13 July 1905, showing the Silverton/Union Battery, operated by the Waihi Gold and Silver Mining Company (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19050713-4-2)

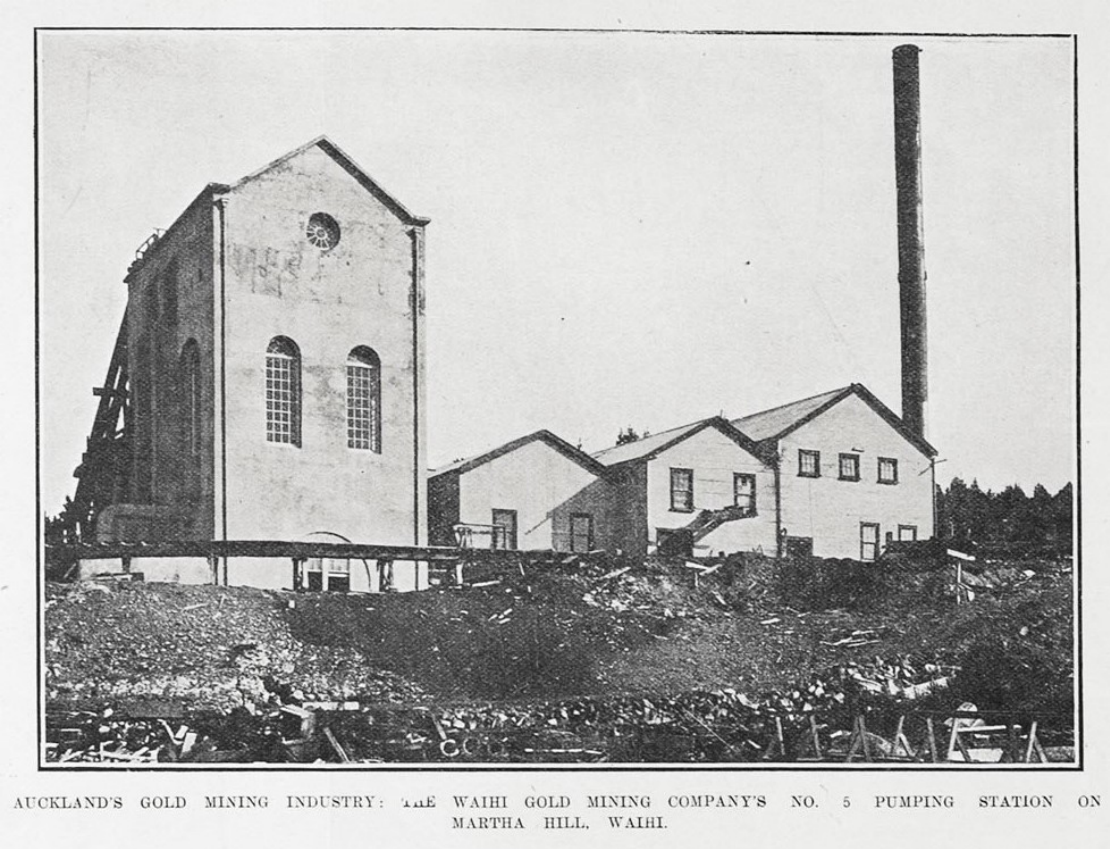
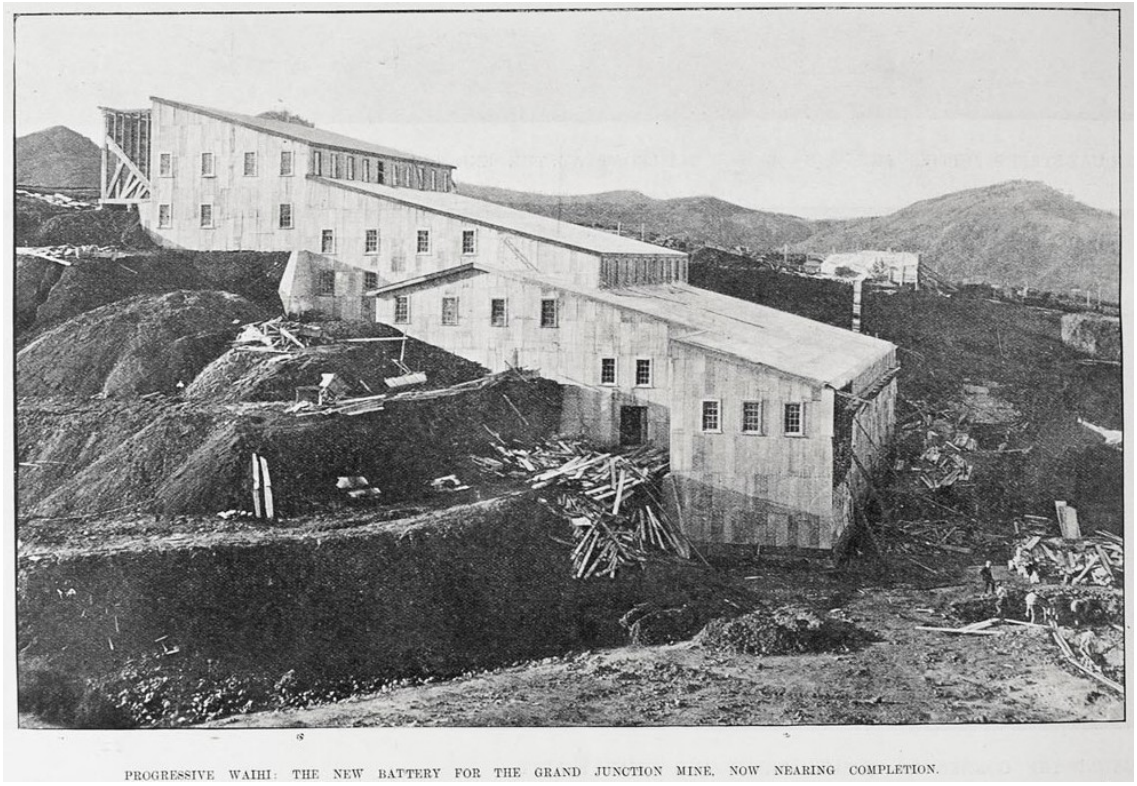


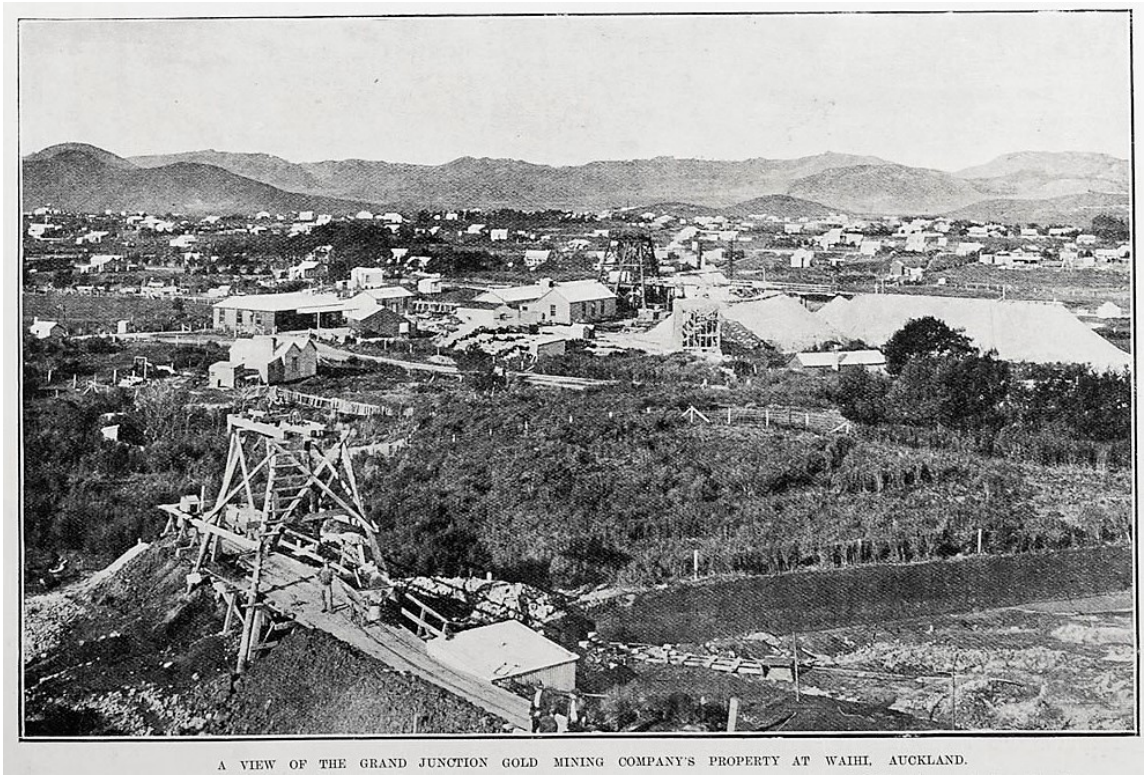
Figure 21. Photograph, dated 13 July 1905, showing the Martha Mine No. 5 Pumphouse at Waihi (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19050713-4-4)

Figure 22. Photograph, dated 1909, showing the Martha Mine No. 5 Pumphouse at Waihi (source: Sir George Grey Special Collections, Auckland Libraries, 7-A9004)



PROGRESSIVE WAIHI: THE NEW BATTERY FOR THE GRAND JUNCTION MINE, NOW NEARING COMPLETION.

Figure 23. Photograph, dated 14 September 1905, showing the new battery at the Grand Junction Mine nearing completion (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19050914-10-2)



A VIEW OF THE GRAND JUNCTION GOLD MINING COMPANY'S PROPERTY AT WAIHI, AUCKLAND.

Figure 24. Photograph, dated 16 November 1905, showing the Grand Junction Company's property at Waihi (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19051116-13-3)

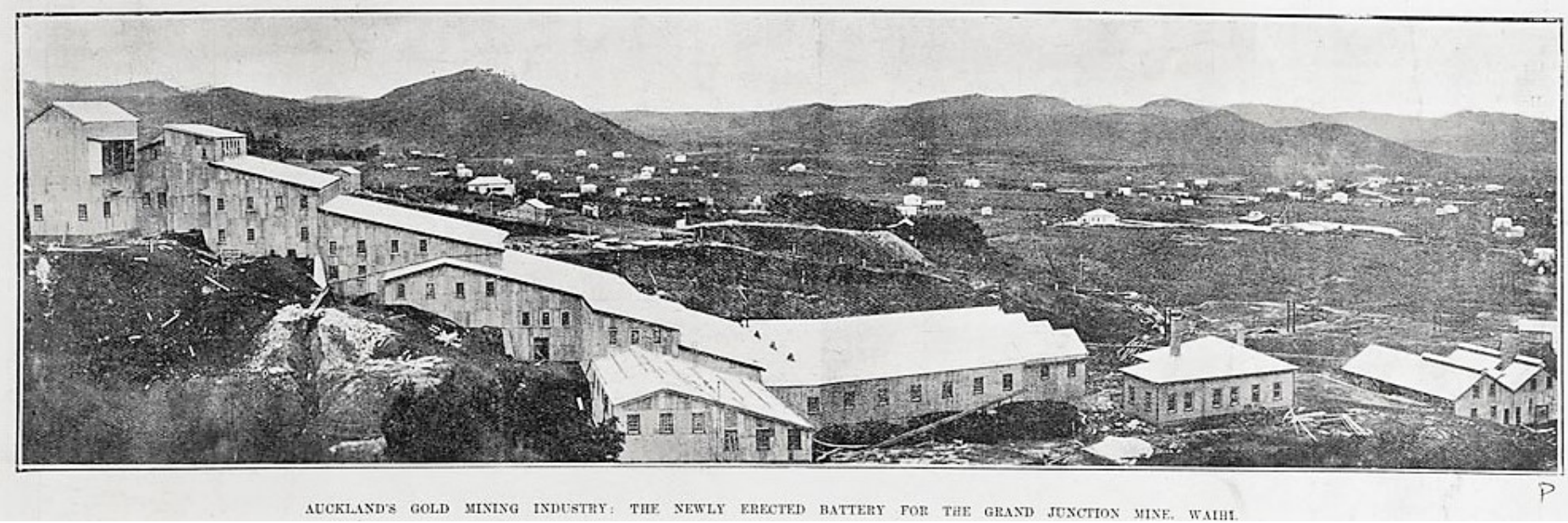
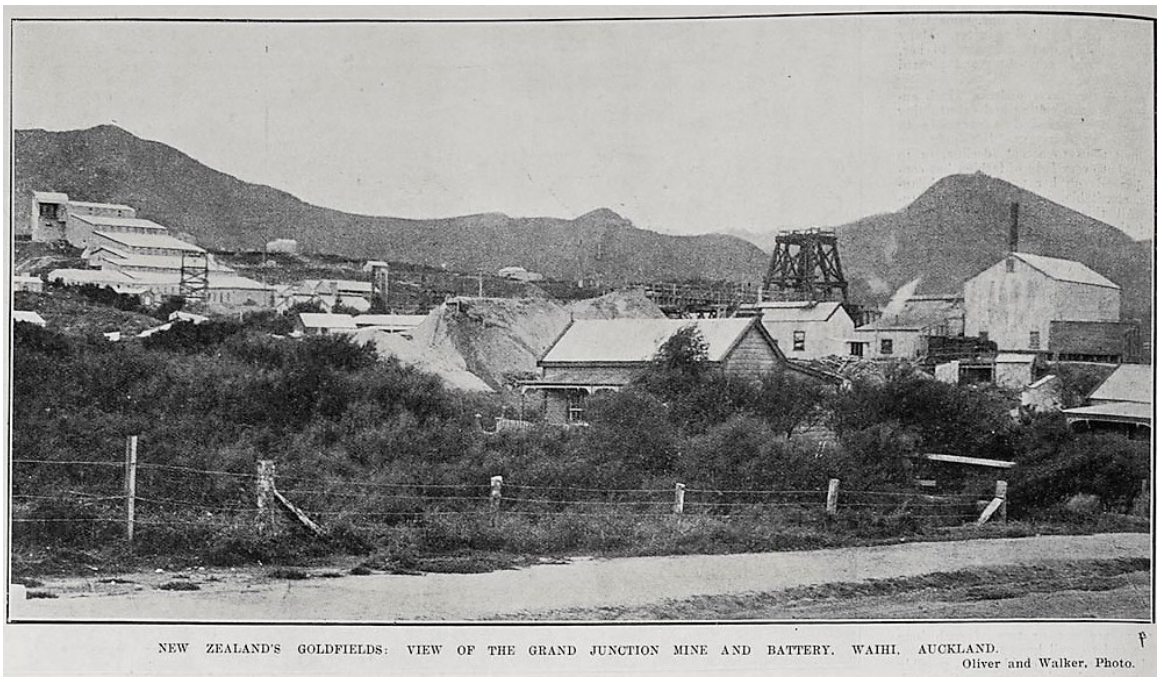
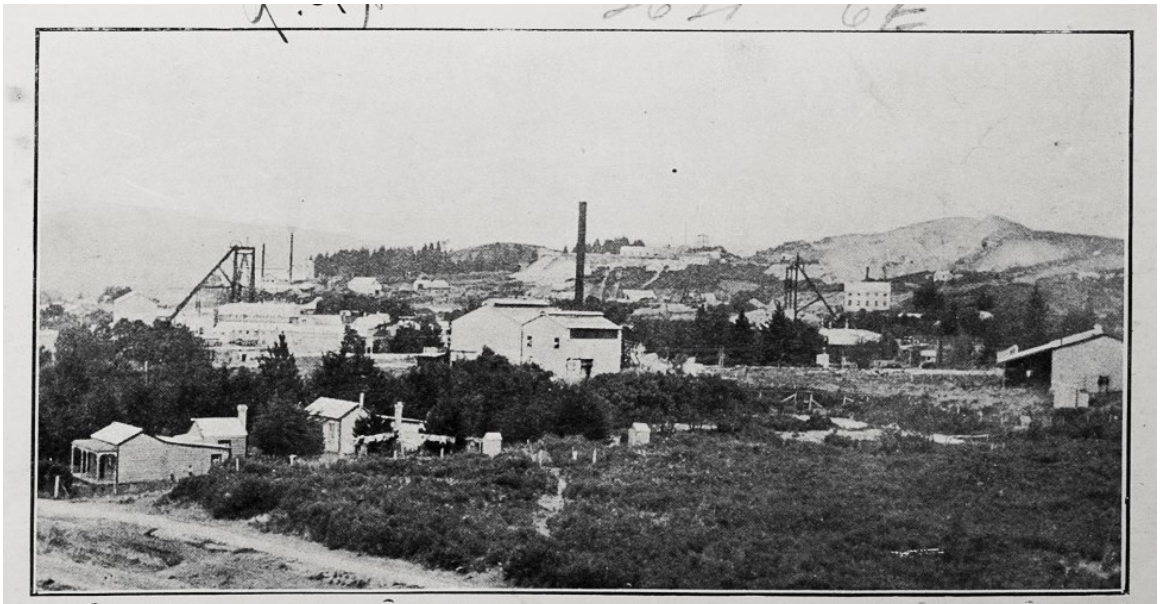


Figure 25. Photograph, dated 23 August 1906, showing the newly completed battery complex for the Grand Junction Gold Mining Company, Waihi (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19060823-5-3)



NEW ZEALAND'S GOLDFIELDS: VIEW OF THE GRAND JUNCTION MINE AND BATTERY, WAIHI, AUCKLAND.
Oliver and Walker, Photo.

Figure 26. Photograph, dated 21 March 1907, showing the Grand Junction Mine complex with battery visible at far left (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19070321-12-1)



A FAMOUS NEW ZEALAND GOLDFIELD: A VIEW AT WAIHI, AUCKLAND, SHOWING MARTHA HILL ON RIGHT, AND WAIHI COMPANY'S SHAFTS WITH THE GRAND JUNCTION POWER-HOUSE IN THE FOREGROUND.
W. Wilson, Photo.

Figure 27. Photograph, dated 29 September 1910, showing the Martha Hill at right with Waihi Gold Mining Company's shafts and the Grand Junction Powerhouse in the foreground (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19100929-10-6)

Gold Production, 1911 to Present

Following the boom years of 1902-1910 Waihi experienced a gradual decline in gold production. One of the main contributing factors was the decreasing supply of payable ore,[129] and McAra notes:

> 'The sudden drop in the gold content of the Martha reef at No. 9 level (1000 ft) which became apparent in 1910 was almost as spectacular as its continual increase in size and value up to that date. Although it was inevitable that the ore would cut out sooner or later, people in Waihi had been so long accustomed to regard the mine as inexhaustible that it came as a shock to find this was not so.'[130]

In April 1911 the Inspecting Engineer to the Minister of Mines, Mr Frank Reed, reported that 'after along period of successive increases the Waihi Mine has at last shown decrease in its annual output. The value of the bullion won from the mine during the past year was £894,815 from 442,020 tons, being in value £33,494 less than for 1909, when the output reached the record total of £959,594.'[131] Owing to the reduced amount of ore, the Waihi Gold Mining Company closed the 90 stamp Waihi Battery (NZAA T13/823) and the 40 stamp Union Battery (NZAA T13/311) in 1911, although the latter was purchased that same year by Henry Hopper Adams, a mining investor.[132] Adams intended to work the Union Battery in conjunction with the Gladstone Mine, which he had acquired in June 1911.[133] Details of the purchase appeared in the *Thames Star* with the following:

> 'A visit was paid to Waihi by Mr H. H. Adams, the well-known mining man, who purchased the Gladstone property the other day for £300, which include[s] not only the mine itself, but all wor[k]ing plant and buildings thereon. Mr Adams spent most of his time making an inspection of the property. It is his intention to open up development work in a thoroughly systematic manner within a few weeks, and already men have started doing some preliminary surface work. About 2000ft of driving has been done in the mine, and stoping on the reefs can be commenced immediately.'[134]

Despite the depletion of certain lodes across Waihi from the 1910s, companies sought to continue production by more moderate means and strategies were devised to ensure long-term success.[135] At the Waihi mine several improvements were carried out, which included doubling the capacity of No. 2 shaft, installing new pumping equipment and driving new crosscuts; however, the Mines Statement for 1912 noted the continuing downward trend: 'There has been serious decline in the production from the Waihi Mine, owing to impoverishment of the lodes at the lower levels. Operations are being energetic- ally carried out for the development of the lodes at greater depth, and it is hoped that the impoverished zone will eventually be passed through.'[136]

The operations of Waihi mines were also affected by the 1912 Waihi strike which lasted from May to November and involved significant numbers of workers. Following years of

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[129] McAra 1988, p.149; Climie 1962, p.60.
[130] McAra 1988, p.134.
[131] AJHR 1911 C-03, p.5.
[132] Lens 2017, p.73; *New Zealand Herald*¸ 27 October 1911, p.5; McAra 1988, p.151.
[133] Ibid.
[134] *Thames Star*, 6 June 1911, p.4.
[135] McAra 1988, p.149.
[136] AJHR 1912 C-02, p.2.

increasing dissatisfaction with the 1894 Industrial Conciliation and Arbitration Act, the Waihi Miners' and Workers' Union appealed to its members to allow deregistration. The union argued that arbitration procedures were too slow and that although the price of gold had risen wages had not been increased since 1901.[137] Deregistration would allow the workers to conduct legal strikes and a majority vote for the scheme was secured in May 1911.[138] However, in March 1912 a small group of Waihi engine-drivers formed a break-away union which was registered under the Arbitration Act.[139] The move prompted 1,000 members of the Waihi Miners' and Workers' Union to cease work in protest and Waihi was the scene of violent clashes throughout mid-1912 (Figure 28 to Figure 30).[140] A halt was called in November and strikers were permitted to return to work. The event altered production levels at the Waihi Mines and the annual Inspector's report for 1913 read:

> 'Owing to the Federation of Labour refusing to allow its members to work with the Waihi Engine-drivers' Union, who had seceded from the Federation and formed a new union (subsequently registered under the Arbitration Act), for nearly six months following the 13th May mining operations were suspended at Waihi. The result, therefore, of operations during 1912 is no criterion of the capacity of the mines.'[141]

By 1913 the Waihi mines were fully operational and around this time a refinery building and strongroom (NZAA T13/314) were constructed at the Grand Junction Mine.[142] Production at Grand Junction peaked in 1914 with 103,321 tons of quartz treated at a value of £227,637, and it was noted that the mine had 'experienced a record year in every respect, the output, yield, average value, and dividends all being higher than during any previous year.'[143] In early 1914 the Waihi Gold Mining Company's new hydro-electric power-installation at Hora Hora, on the Waikato River, was brought into commission.[144] Negotiations over the scheme had been ongoing since around 1910 and details of the plant appeared in the *Wairarapa Daily Times* in December 1913:

> 'The new plant harnesses up the Hora Hora rapids to specially constructed dynamos, and the power thus obtained is transmitted about 50 miles by means of copper cables to the [Waihi] company's battery at Waikino, and thence to the mine at Waihi. The new power will be utilised at Waikino for driving all the machinery now driven by steam and gas power, embracing the whole of the crushing and treatment plants and tubemills. At the mine the hydro-electric power will be used

[137] McAra 1988, p.258.
[138] H.E. Holland. *The Tragic Story of the Waihi Strike*, Wellington, 1913, p.20.
[139] McAra 1988, p.258; Mark Derby, 'Strikes and labour disputes - The 1912 and 1913 strikes', Te Ara - the Encyclopedia of New Zealand, http://www.TeAra.govt.nz/en/strikes-and-labour-disputes/page-5 (accessed 24 August 2017)
[140] Ibid.; McAra 1988, p.259.
[141] AJHR 1913 C-02, p.4.
[142] R.H. Hooker. June 2010. Report on Earthworks monitoring of the Refinery Building Relocation, Waihi Grand Junction Mine, Waihi. Unpublished report prepared for Newmont Waihi Gold Ltd, p.3. Note: Both secondary and primary sources provide scant detail regarding the Grand Junction Refinery building and strongroom, although a number were consulted for this project.
[143] AJHR 1915 C-02, p.21.
[144] Ibid.; McAra 1988, pp.28 & 154.

> for the pumping, winding, and air-compressor plants. It is by means of the last-named that the rock drills are worked.'[145]

A powerhouse/transformer house (NZAA T13/302) was likely to have been erected at Martha Mine following the completion of the Hora Hora power station, when machinery at the mine was converted to electric-drive.[146] The concrete structure, located around 53 metres west-south-west of the Cornish Pumphouse, received the Martha Mine power supply from a sub-station at Waikino which was then reduced through a bank of four 625 K.V.A., 3-phase Siemen's transformers to 2,000 volts, and then distributed to the various mine machinery.[147] The Martha Mine Cornish Pumphouse was decommissioned following the completion of the Hora Hora hydro-electric station, although it was kept in working order until 1929.[148]

The advent of the First World War (1914-1918) brought further changes to the development of Waihi, and significantly reduced the available work force. Henry Hopper Adams continued to treat tailings from the Gladstone Mine at the Union Battery until around the time of the Waihi Strike, and the battery was eventually demolished in 1915.[149] Work on the original Favona shaft (NZAA T13/306) briefly recommenced in 1915 after the consolidated shaft failed to produce payable quartz; however, operations ceased in 1917.[150]

By the end of the 1910s smaller mining companies, once numerous across Waihi, had disappeared and only the Waihi Gold Mining Company and Grand Junction Company remained (Figure 31). In 1919 the Grand Junction Company acquired the Waihi Extended claim, although extensive prospecting yielded little payable ore.[151] Output from the Grand Junction Mine gradually declined and in 1925 the company's funds were exhausted. Facing closure, an agreement was entered into with the Waihi Gold Mining Company to lease the Grand Junction mine on a profit-sharing basis for a period of 10 years.[152] The extensive Grand Junction Battery, processing plant and powerhouse were decommissioned by 1933; however, the Grand Junction Company continued to exist as a commercial entity until 1939, when a meeting of shareholders voted to place it into voluntary liquidation.[153] The holdings were purchased by the Martha Gold Mining Company (Waihi) Ltd (which had been formed by the Waihi Gold Mining Company to work the Martha Mine in 1935) and the details were published in the *New Zealand Herald* in June 1939:

> 'An initial distribution of 2s a share, sterling, is being made to shareholders in the Waihi Grand Junction Gold Company, Limited, following the recent decision to go into voluntary liquidation. Warrants for this amount have now been received by

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[145] *Wairarapa Daily Times*, 19 December 1913, p.5.
[146] NZAA site record T13/302.
[147] Ibid.; McAra 1988, pp.201-203.
[148] 'The Cornish Pumphouse', Oceana Gold Waihi Operations website accessed via: http://www.waihigold.co.nz/about/history/the-cornish-pumphouse/
[149] Lens 2017, pp.74-75.
[150] NZAA site record T13/306.
[151] NZAA site record T13/312.
[152] Ibid.; McAra 1988, p.161; *Northern Advocate*, 3 August 1926, p.2.
[153] NZAA site record T13/312; Climie 1962, p.63; R.H. Hooker. May 2009. Report on Proposed Relocation of Waihi Grand Junction Refinery Building, Waihi. Unpublished report prepared for Newmont Waihi Gold Ltd, p.3. Note: McAra states that 'the Grand Junction powerhouse continued to operate for a time into the national grid but finally ceased about 1929.' McAra 1988, p.204.

> New Zealand shareholders from the liquidator in London…The whole of the company's assets were purchased by the Martha Gold Mining Company (Waihi), Limited, last year. Winning of ore from the Junction shaft ceased at the end of 1937. The Martha company mined and treated about 265,000 tons of ore which would otherwise have been left in the property. The Waihi Grand Junction Company was incorporated in 1897, and was a reconstruction of a company of the same name registered in 1895 to acquire properties in Waihi. An agreement was entered into in 1926 for the Waihi Gold Mining Company, Limited, now the Martha Company, to develop sections of the mine, profits to be shared equally. Dividends of 1d a share were paid in 1928 and 1929, and 4d a share, tax-free, from then onward. Profits for the last financial year, ended December, 1937, were £9622.'[154]

Rising prices for gold on the international market allowed the Martha (or Waihi) mine to operate profitably throughout the 1930s; however, the Second World War (1939-1945) created a labour shortage and in 1942 production from the mine declined by 12,374 tons.[155] By 1949 the mine extracted 81,388 tons worth £307,181, and underground mining operations at Martha eventually ceased in 1952.[156]

Intermittent mining was carried out at Waihi throughout the 1950s and 1960s. The Frewin Brothers worked on the Martha refinery site from 1955 to 1960 and in 1959 a Canadian Company, known as South Pacific Mines, acquired the rights to treat surface ore on the Union and Martha Hills.[157] During the 1970s the Union Hill area was worked by Mineral Resources NZ Ltd, who built a gold recovery plant and scavenged from the old Waihi Battery and refinery site.[158] Bulk sampling on Martha Hill was undertaken by the joint venture known as Waihi Mining and Development (comprising Mineral Resources and Green and McCahill) from 1978 to 1980 and investigation of the Union Hill, Silverton, Gladstone Hill, and Favona areas was continued by Mineral Resources (later Otter Gold Mines Ltd) into the 1990s.[159] Other areas were also re-opened for prospecting in the late 20th century. In 1987 a mining license for Martha Mine was granted to the Waihi Gold Company who installed a conveyor tunnel through Union Hill and commenced operations in 1988.[160] An Exploration Permit was later granted to Welcome Gold Mines Ltd (owned by ACM) and Auag Resources Ltd (owned by Otter Gold Mines Ltd), known as the Union Hill Joint Venture, over the Union Hill and Favona sites in 1998.[161] Normandy Mining acquired ACM in late 1990s and, in December 2000, entered into an agreement to sole fund exploration on Union Hill and Favona.[162] In February 2002 Normandy Mining was acquired by Newmont, and in 2016 the Waihi Gold Mining Company Ltd (the New Zealand holding for Newmont's Waihi operations) was sold to Oceana Gold (New Zealand) Ltd.[163]

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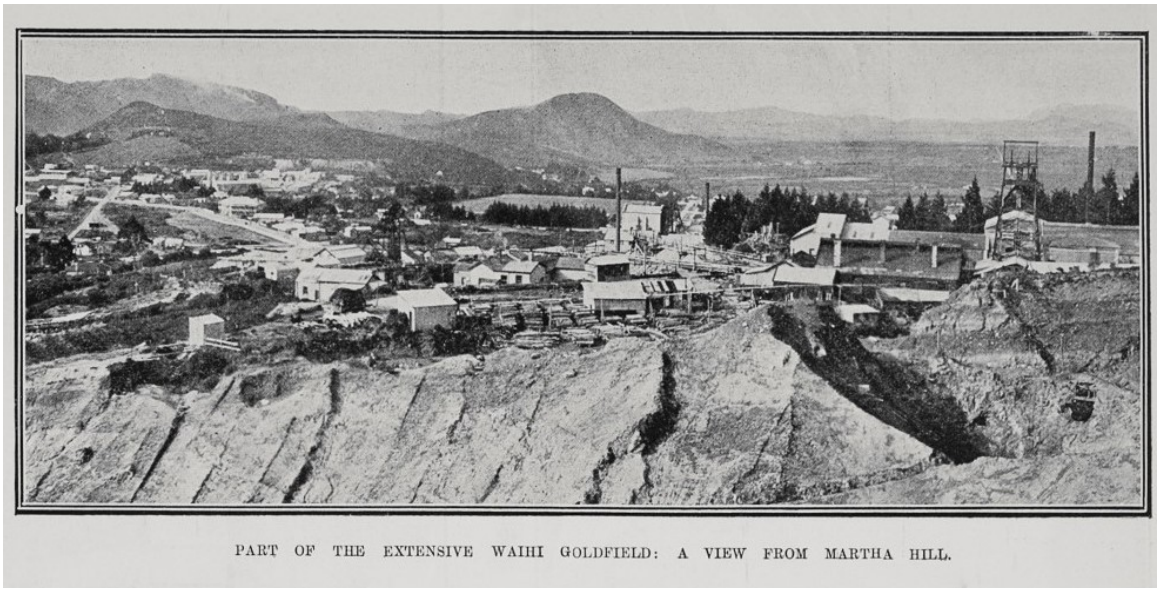
[154] *New Zealand Herald*, 5 June 1939, p.5.
[155] Climie 1962, p.65; McAra 1988, p.167.
[156] McAra 1988, p.168.
[157] Clough 2004, p.14.
[158] Ibid., p.43.
[159] Ibid., 44.
[160] Ibid., p.17.
[161] Ibid., p.14.
[162] Ibid., p.44.
[163] Ibid.; 'The Modern Martha Mine', Oceana Gold Waihi Operation website, accessed via: https://www.waihigold.co.nz/about/history/timeline/the-modern-martha-mine/

STANDING IDLE FOR THE FIRST TIME IN SEVEN YEARS: THE PUMPING STATION ON THE WAIHI GOLD MINING COMPANY'S PROPERTY.

Figure 28. Photograph, dated 30 May 1912, entitled 'Standing Idle for the First Time in Seven Years' showing the Waihi Gold Mining Company's pumping plant (including the Cornish Pumphouse at far left) during the Waihi Strike (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19120530-5-1)



PART OF THE EXTENSIVE WAIHI GOLDFIELD: A VIEW FROM MARTHA HILL.

Figure 29. Photograph, dated 30 May 1912, with a view from Martha Hill, showing part of the extensive Waihi goldfield during the Waihi Strike (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19120530-9-2)

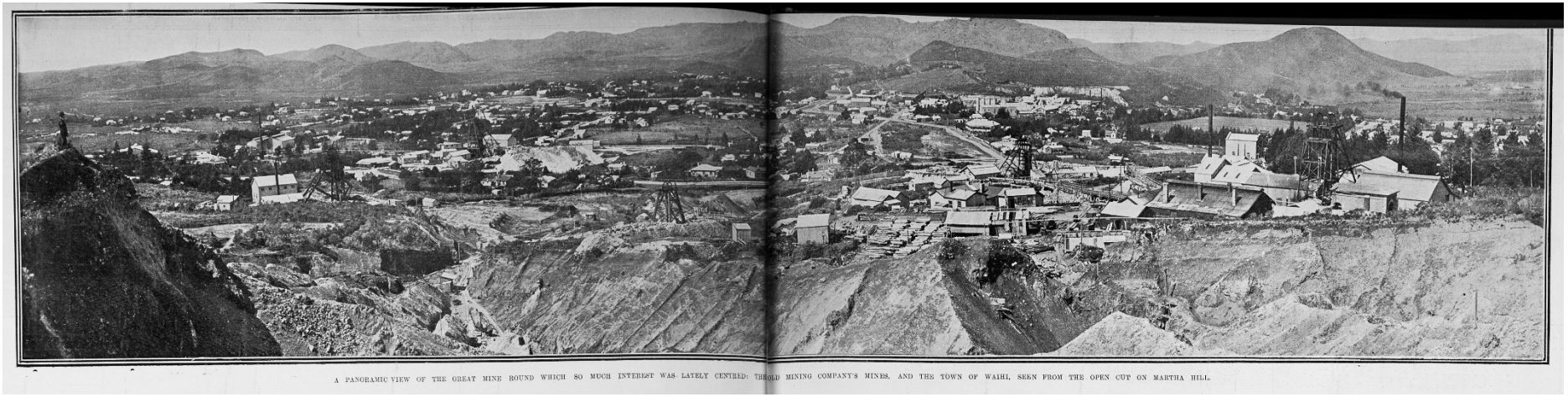


Figure 30. Panoramic photograph, dated 10 October 1912, showing the Waihi Gold Mining Company's mines during the Waihi Strike with the township visible in the background (source: Sir George Grey Special Collections, Auckland Libraries, AWNS19121010-9-1)

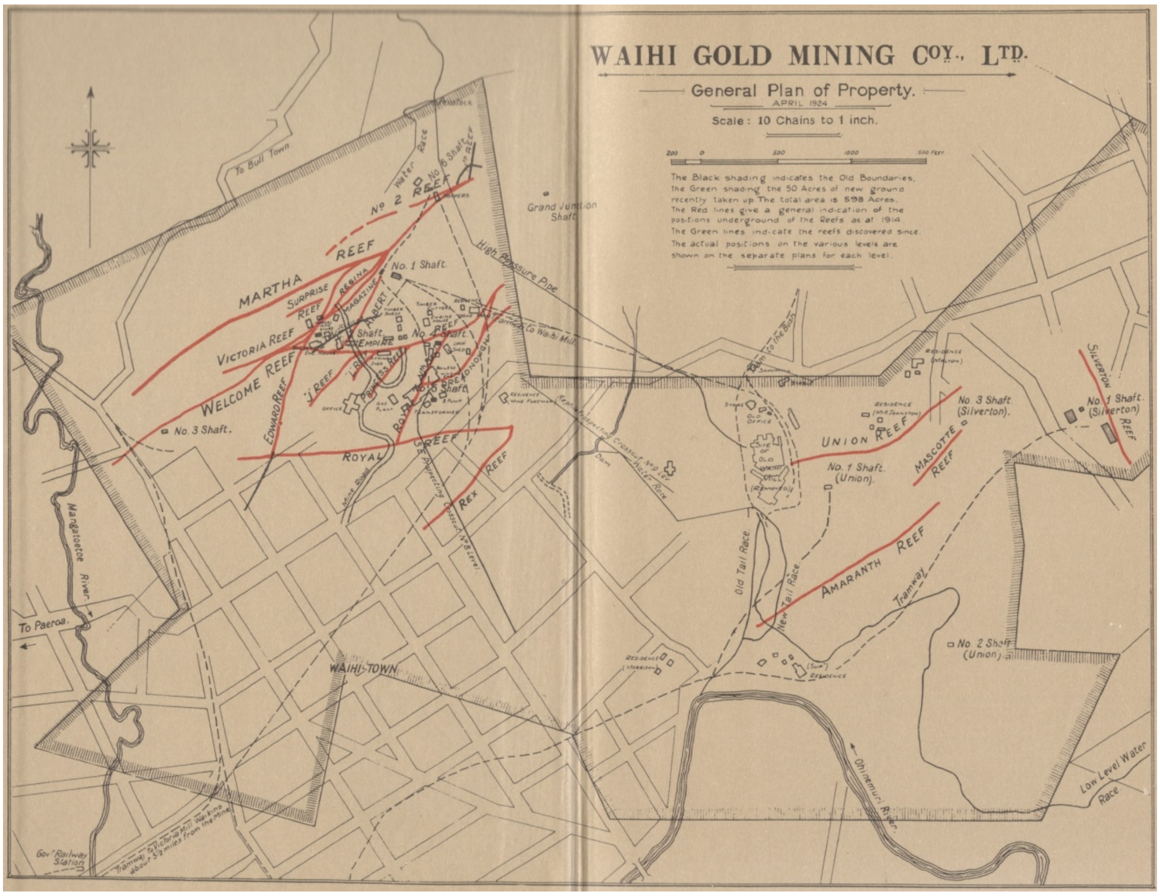


Figure 31. General property plan of the Waihi Gold Mining Company, dated 1924, showing the various reefs, workings, tramways and water races across the Waihi central area (source: McAra 1988: np)

Water Races

A reliable supply of water was a significant part of mining operations in Waihi and played an integral role in maintaining power supply (i.e. to Pelton wheels and steam engines) and processing the ore (i.e. wet crushing, washing, slimes, separation, cyanide and other processes) (Figure 33 and Figure 34). [164]

Waihi Low Level Water Race (NZAA T13/817)

The Waihi low level (or low pressure) race was constructed by the Waihi Gold and Silver Mining Company in 1889 to deliver water from the Ohinemuri River to the Waihi Battery on Union Hill. It operated until 1913, when the battery was closed down.[165] This source drove two Pelton wheels at the bottom of a 52ft shaft where the waste water was conveyed back to the river some 1200ft away.[166] This provided sufficient power to run the mill and steam was relegated to a back-up supply.[167] Details of the race were provided soon after its completion in the 1890 report to the Minister of Mines:

> 'A dam has been constructed in the Ohinemuri River, and also another dam has been constructed in one of the branch creeks, as a supplementary supply. The water-race from the main dam to the battery is about 212 chains in length [4.2km], and the dimensions of the ditch are, 3ft. 6in. on the bottom, 9ft. across the top, and 2ft. 9in. in depth. Assuming that it is capable of conveying water to the depth of 2ft. 6in., this would be equal to about twenty sluice-heads; the fall or gradient of the ditch being 1 in 2,000.'[168]

Waihi High Level Race

The high level (or high pressure) race (also known as the Waitete water race) was completed by 1892 to deliver additional water to the mill from Waitete, Walmsley and Mataura Streams. These three races delivered their water to a penstock on Martha Hill, and then by pressure pipe to the Pelton wheel via Pipe Lane.[169] Three Pelton wheels ran on this water and the races totalled 12 miles in length.[170] Progress on the construction of the race was reported in May 1891 by the *Thames Star*:

> 'The circular saw, which is humming away every day, is doing good work. Two experienced men from the Thames are working it, and they turn out from 5000 to 7000 feet daily. Five teams of horses are continually bringing timber from Waitekauri to keep the saw, going, the timber arriving in junks or flitches. There are no less than 12 pair of sawyers breaking down and flitching. After being cut into suitable sizes by the circular saw, the timber is carted away for miles in every direction for the purpose of constructing fluming, building dams; and erecting trestle work. The water pipes which are to convey the water to the Pelton wheels for the new 30 head of stampers, are arriving daily on the ground. Messrs Price

[164] Clough, 2004, p.79.
[165] Ibid.
[166] AJHR 1890 C-03, p.41.
[167] Clough 2004, p.79.
[168] AJHR 1890 C-03, p.41.
[169] Clough 2004, p.79.
[170] AJHR 1892 C-03, p.46.

> Bros., who have the contract for supplying and placing the same in position, are expected to commence the work in a week or ten days, or as soon as all the earthwork is completed. The pipes when laid will cover a distance of half a mile. They are 26 inches in diameter, and will give about 701bs of pressure to the square inch, the fall being about 140 feet. After passing through two Pelton wheels the water will be carried into the present race and again utilised as motive power.'[171]

Tramways[172]

Tramways were a convenient and economic solution to the problem of moving heavy materials, and historic plans reveal a multitude of tramways across Waihi (see Figure 33 and Figure 34). Horses were the early motive power, except on the Silverton tramline, where a small locomotive was used from the outset. Even when the rakeline (rail) from the Victoria Battery was commissioned and locomotives used, ore and wood were still hauled to the Waihi Battery by horse.

Silverton Tramway (NZAA T13/818)

This tramway took ore from the Silverton kilns along the eastern side of Union Hill, through what is now Gilmour Reserve, through town to the Silverton Battery on the Ohinemuri River. Although the Silverton Company took over the old Martha Battery in 1891, there is no mention of a locomotive before the Mines Statement of 1896.[173]

New No.1 Shaft Tramway

This was built by the Union-Waihi Company (c.1899) to transport their ore from the New No.1 Shaft to their newly acquired mill on the Ohinemuri (this was the old Silverton Battery, renamed the Union Battery). This short length of tramway appears to have exited a tunnel below the Union tiphead, and negotiated a steep section as a self-acting incline.

Ore Tramway from Martha Hill to Kilns

This was built when the Martha property was purchased in 1890. The ore was taken to the top of the kilns, even when they were no longer used. Coal was delivered to the hoppers above the boiler house by this same tramway (from 1904), though in 1908 an additional line was laid from Martha Hill to avoid conflict with the ore traffic.

Rakeline (Waihi Gold Mining Company's Martha to Victoria Battery Ore Tramway) (NZAA T13/305, T13/310 & T13/346)

In 1896 the Waihi Gold Mining Company commenced work on an 8km rakeline (narrow gauge railway) for the transport of quartz ore from the Martha Mine to the Victoria Battery at Waikino.[174] The line was largely completed by March 1897 and details of its progress were provided in the annual goldmining report for that year:

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[171] *Thames Star*, 18 May 1891, p.4.
[172] Note: This section is largely derived from Clough 2004, p.84, except where otherwise stated.
[173] AJHR 1896 C-03, p.76.
[174] NZAA site record T13/310.

> 'The length of the tramway from mine to Owharoa Mills is, approximately, five miles and three- quarters. It has been constructed of gauge of 2ft. 9in., the smallest curve having 6-chain radius. It has been well graded throughout, being, with only one exception (which has an up-grade of 1ft. in 90 ft.), all down-hill with a load, the steepest grade being 1ft. in 40ft. The line crosses from the north to the south bank of the Ohinemuri River, at a distance of two miles and three-quarters from the mine, by means of a strong truss bridge, upwards of 185ft. in length, and 30 ft. 6in. high from water-level to decking, and built of good sound heart of kauri and totara. The whole of the formation of this tramway has been completed, and upwards of-three miles laid with heart of kauri sleepers and 40lb. iron rails. All the culverts have been made with glazed earthenware pipes, which will be more durable than wooden culverts; and all the swamps which the line traverses have been drained by good substantial drains. The locomotive has been put together, and is now busily engaged ballasting the line and hauling building-stone to the mill. Twelve of the iron side-tipping trucks are on the ground, and we have received advice that fifty more, which should be sufficient for our requirements, are now on their way out from England.'[175]

Two rakes[176] were usually operated on the line and a passing loop and water tanks (for refuelling the engines) were sited at a midway point to allow the trains to pass.[177] McAra notes:

> 'The rakes were normally hauled by the two larger locomotives the *Empire* and the *Dominion*, the *Waikino* taking over during boiler checks or breakdowns. The other three smaller locos, the *Albert*, the *Ohinemuri* and the *Victoria*, were used occasionally for shunting but at Waikino most of this was done by a beautiful white horse which became a familiar sight about the plant over many years…The rattle of forty, unsprung, rigid, four-wheeled trucks going full-speed down-hill through some of the main streets of Waihi created quite a din but the townspeople never seemed to mind, probably because they saw not only the noise, inconvenience and possible danger, but also the life-giving stream of gold to which their town owed its existence.'[178]

Firewood (Timber) Tramways

These went to the top of the kilns, the New Shaft, and to the Powerhouse. Firewood came from the Walmsley and Mataura Valleys, the tramline running between Walmsley and Gladstone Roads. The sawmill was built beside this tramway in 1907. Mine timber presumably came from the same bush. Boilers were almost exclusively wood fired until the Paeroa to Waikino portion of the railway to Waihi was completed in 1904. Coal could then be cheaply railed to Waikino, and then sent from the Victoria Battery via the rakeline.

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[175] AJHR 1897 C-3, pp.91-92.
[176] 'The "rakes" referred to the forty or so trucks of ore hauled constantly through Waihi by steam locomotives to the battery at Waikino.' McAra 1988, p.331.
[177] NZAA site record T13/310.
[178] McAra 1988, p.213.

Other Industry and Infrastructure

Laurie Bros. Brickworks

Climie (1962) reports that brick yards and kilns were present on Kenny Street:

> 'The works were owned by Laurie Bros., and were situated between Seddon Street Extension and Kenny Street, on the flat land beyond Gilmour Street. There was a track through the tea-tree past the brick yards and recreation ground to the Waihi battery. A small creek ran across this track, crossed by a 12in plank, and one had to be reasonably sober to cross it. Many times the writer found fellows looking doubtfully at the plank and gave them a hand across. I remember one who never would accept help, but crossed by walking through the creek, using the plank as a hand-rail. Usually he was so happy that he didn't bother about wet feet and legs but I used to wonder what his wife had to say about it.' (Climie 1962: 165)

Research suggests that the brickworks were likely to have been present on the site from around 1897. The *Thames Star* reports in 1897 that 'The following were granted :— J.S. Laurie, special site, 1 ½ acre, Waihi, granted subject to his using it for brick purposes and not as a residence site'.[179] In 1901 the brickworks were evidently still operating. It was reported that 'Our Waihi correspondent states that a horse and dray belonging to Mr. Laurie, brick manufacturer, capsized over an embankment going up Martha Hill from the main street, yesterday. The driver escaped injury. The horse and dray were somewhat damaged, but not seriously.'[180] Evidently it was known that the 'brick kiln at the end of Kenny Street flourished for many years, but the completion of the brickwork round the plant of the mines and batteries left the works without a market, and the prevalence of tin chimneys did not help.' (Climie 1962: 19).

The exact location of the brickworks is not confirmed; however, based on descriptions it is thought to be located in the block of the present-day Rugby Park between Kenny Street and the Martha pit. In the 1909 plan of Waihi two sections of land were present north of Kenny Street, within the present day rugby field (section number 90A and 90B) (Figure 35). The Waihi Past and Present Map (Clinie 1962) shows the 'Old Brick Works' in this location but immediately to the northeast of the rugby field. However, a 1910 image looking southeast across Kenny Street and the 'No.1 Recreation Ground, Waihi, N.Z.' towards Union Hill and the Waihi Battery shows what could be the brickworks site directly opposite Clarke Road on the northern side of Kenny Street in what is now the location of Rugby Park (Figure 32).

[179] *Thames Star*, 26 June 1897, p.3
[180] *New Zealand Herald*, 29 January 1901, p.4

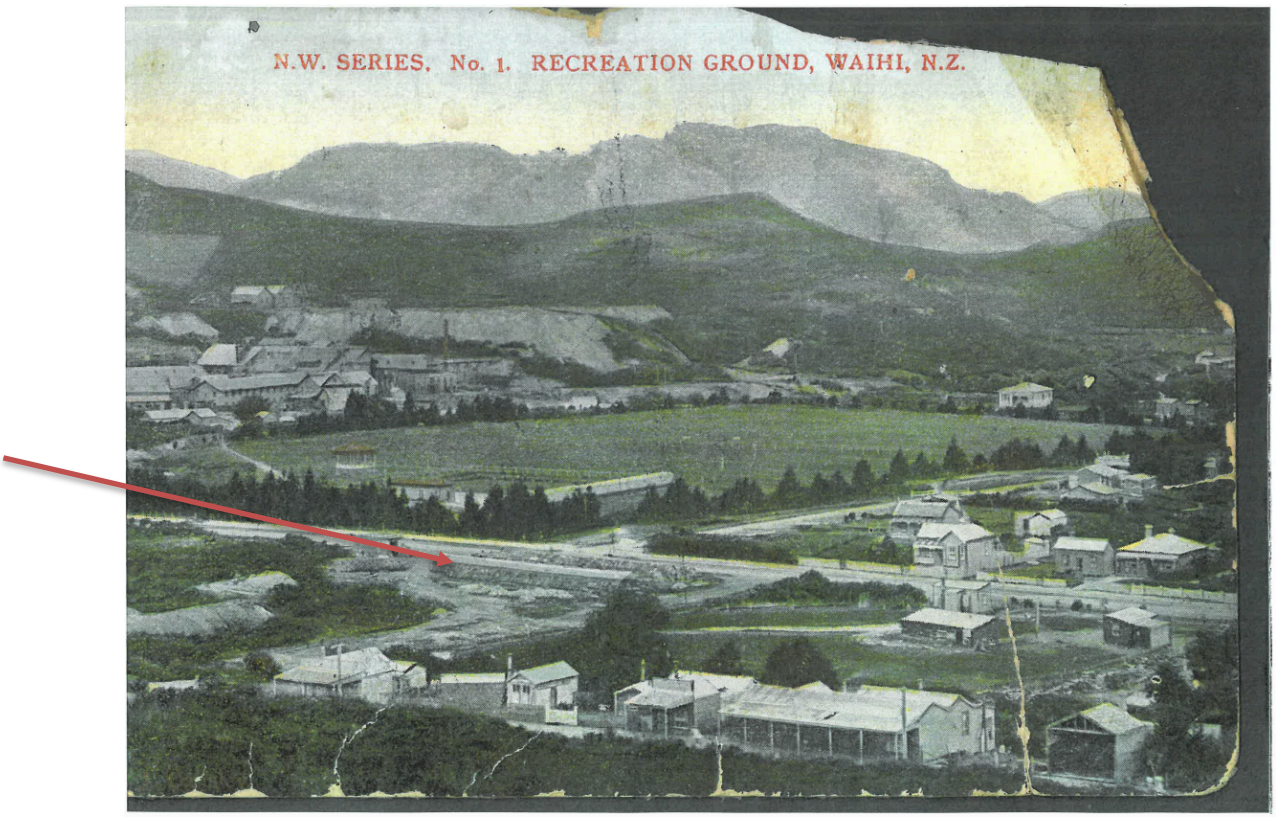

Figure 32.

The Old Town Reservoir

It is possible that the old Waihi town reservoir was within the project area, somewhere on the southern side of the Martha pit rim, dating to c.1898. A timeline on the *Ohinemuri Journal* webpage notes that before 1905 there was 'A small reservoir on Martha Hill, possibly fed from Mangatoetoe Stream (pipes still follow the Bulltown tramway).'[181] It is also shown in Figure 48 (below).

Further research undertaken located an 1894 article in the *Thames Star* that reports:

> 'The Waihi Miner states:- The long looked-for water supply may now be regarded as an accomplished fact. The result of an inspection of the work shows that the reservoir and excavation for the main pipe are practically completed, and that any delay in getting the water at once into Waihi is the want of pipes, which are on their way from America. The reservoir is a covered-in concrete cistern 62 feet long by 20 feet wide, and 5ft 9in. deep, and will contain about 50,000 gallons. The filter cistern is 20 feet by 20 feet, and connects with the reservoir. The work has been carried out in a most satisfactory manner by Mr J. Keane'.[182]

[181] see: http://www.ohinemuri.org.nz/research/waihi-municipal-water-supply-dams/1911-03-time-line-and-map
[182] *Thames Star*, 2 December 1898, p.4

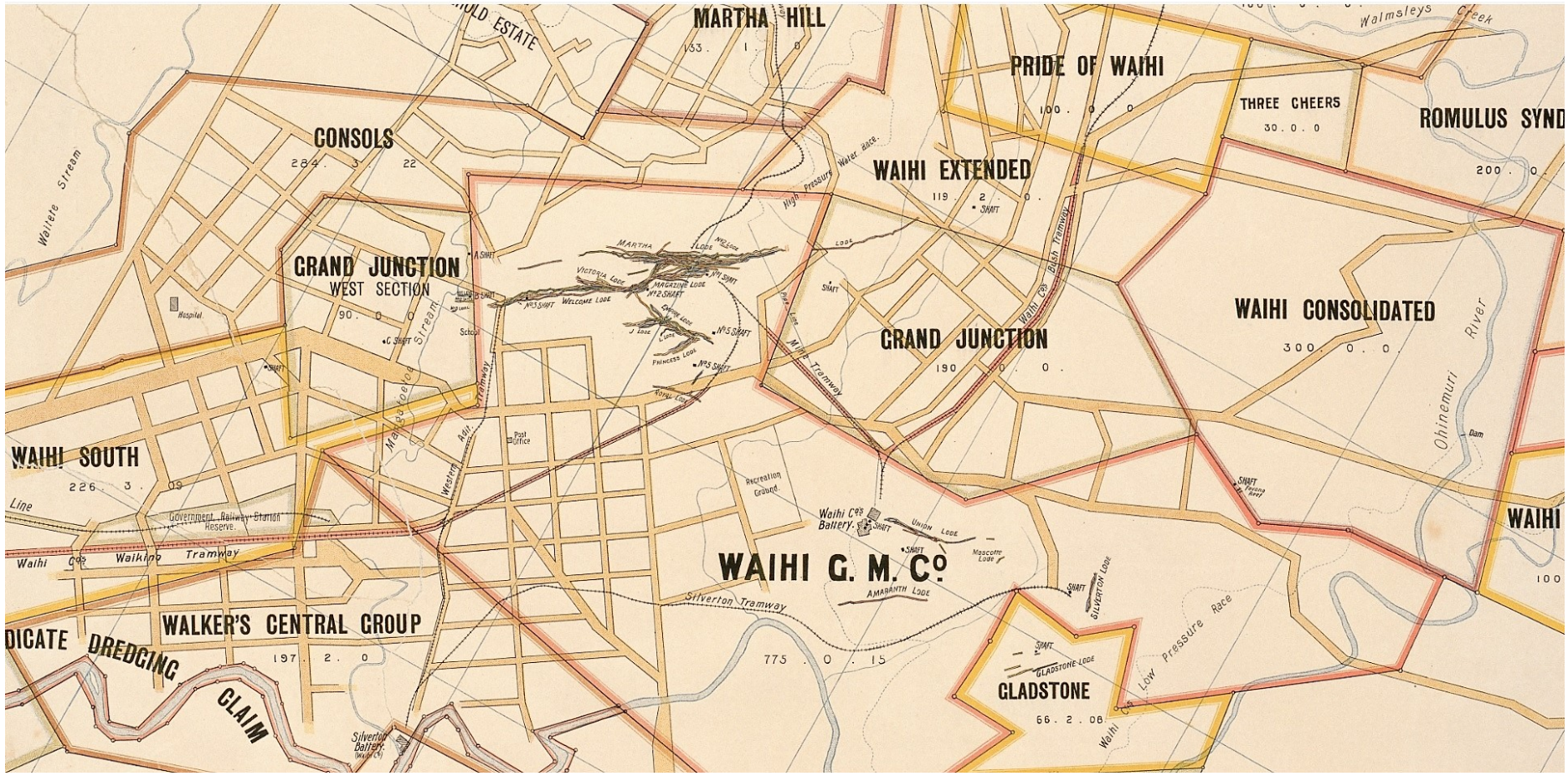

Figure 33. Close-up view of plan of the Waihi Goldfield, dated c.1900s, showing the various tramways and water races across the central Waihi area (source: Sir George Grey Special Collections, Auckland Libraries, NZ Map 197)

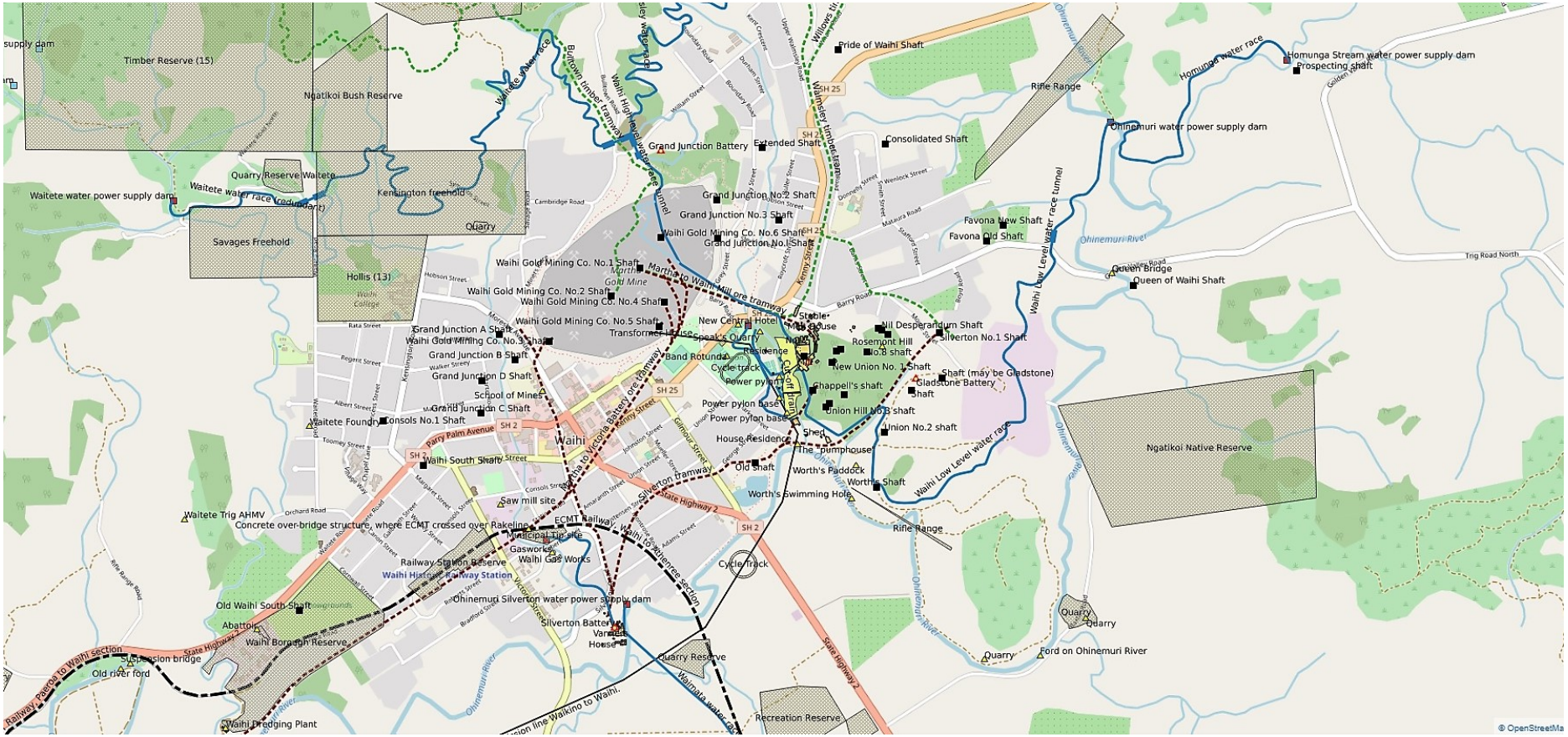

Figure 34. Plan of Waihi with mapped GIS overlay showing the locations of various tramways and water races across the central Waihi area (source: Ohinemuri GIS, accessed via: http://www.ohinemuri.org.nz/gis)

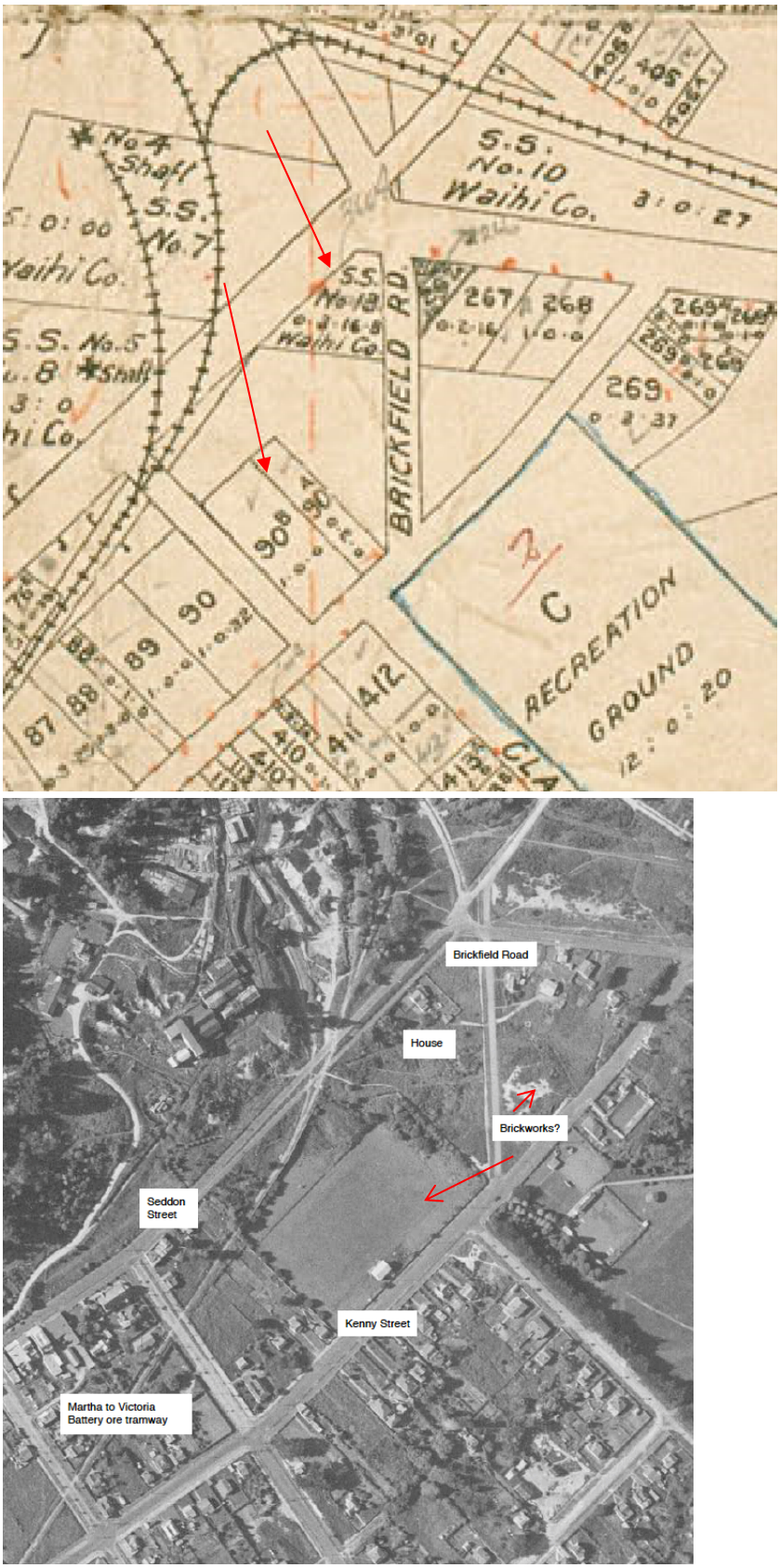

Figure 35. Top: close-up of Index plan of Waihi Township, dated 1909, showing subdivision and mining areas; possible brickworks site is arrowed (source: Sir George Grey Special Collections, Auckland Libraries, NZ Map 3604). Bottom: 1942 aerial with possible brickworks structure (source: Retrolense)

Waihi Township

Following the discovery of payable gold at Waihi in the late 1870s the area attracted a steady influx of prospectors who settled around their various mining claims. Early miners' camps often consisted of tents or rudimentary huts, constructed from wood and iron with an exterior chimney (Figure 36 to Figure 38). Supplies to small mining communities such as Waihi were limited and access routes often proved unreliable. The landscape comprised difficult, mainly unformed terrain, and McAra notes:

> 'Life in the Waihi district was at this time very primitive, access being mostly by bridle paths or clay roads which often followed the old Maori tracks. Supplies brought in by boat were obtained from Paeroa, Bowentown and Katikati, carried by drays if there were roads, or otherwise by packhorses.[183]

By 1881 government surveying of the Waihi area had commenced and the annual report of the Surveyor-General noted:

> 'A considerable area (457 acres) has been laid out in town sections, numbering 1,022, at a cost of 13s. per section. This includes part of Tauranga, part of Ngaruawahia, part of Cambridge, Waihi Gold Field Town, Te Aroha Government and Gold Field Towns.'[184]

The location selected for town surveying at Waihi was not regarded favourably by all miners, and the *Thames Advertiser* wrote:

> 'The site selected for the Government township here is pretty generally condemned because of its broken undulating character, and the miners, business men, and others are pegging off sections on a site situated at the junction of the Waihi company's tramway and the County road, which is admirably adapted for building purposes.'[185]

In July 1881 the first site marked off in the township of Waihi was pegged out by a Mr Hosie, who proposed to erect a hotel on the land.[186] Huts were said to be 'going up in all directions' and timber resources became scarce 'in consequence of the absence of the Maoris [into the King Country], who were diligent in cutting timber and preparing the same for use.'[187] A general store and baker's oven were also under construction by a Mr Alexander Unthank and in October 1881 the *Bay of Plenty Times* reported:

> 'Nearly all the sites in the newly surveyed township [of Waihi] have been leased, and several licenses have been granted to enterprising capitalists, who have undertaken to erect suitable hosteleries, for the accommodation of visitors. Plans and specifications are already out for an imposing structure to be called the Waihi Hotel, and it is rumoured that Mr C. Curtis, of Thames celebrity, contemplates erecting a palatial edifice, which, for size and comfort, will eclipse everything of the kind as yet seen up in the Northern Island. At the present time there is no getting a meal, let alone a bed, nearer than Owharoa, which is six miles distant from the

[183] McAra 1988, p.46.
[184] AJHR 1881 C-04, p.4.
[185] *Thames Advertiser*, 3 October 1881, p.3.
[186] *Thames Advertiser*, 30 July 1881, p.3.
[187] *Thames Advertiser*, 5 October 1881, p.3.

> mines, and this circumstance alone is a great inconvenience to those desirous of visiting our attractive neighbourhood.'[188]

Progress at Waihi continued during the early 1880s and a description of the fledgling settlement was provided in the Goldfields Report of 1882:

> 'At the Waihi, near to the mines, a township has been laid off and several buildings have been erected, including a substantial hotel… The settling of a permanent population at Waihi would prove a great boon to the settlers at Katikati, affording them an excellent market for their farm produce. They appear fully alive to the importance of this, as, through their County Council, they are hard at work forming roads to connect the mines and settlement.'[189]

In 1885 Waihi became part of the newly created Ohinemuri County which comprised four ridings and included the townships of Paeroa, Waikino, Waitekauri, and Karangahake.[190] The Ohinemuri County Council prioritised the formation and upgrading of roads throughout the county and Barber notes that 'minutes [of the council] from 1885 until the turn of the century display a continuous concern over the need to meet mining company and settler demands for better road access from a limited budget.'[191] Repairs to the Waihi main road were carried out and the erection of a new Waihi bridge in 1890 aided the development of the township.[192]

Developments in ore extraction methods from the early 1890s increased confidence in the economic viability of gold prospecting and attracted hundreds of new miners into the Waihi area. This growth invigorated the Waihi township, formerly described as 'a village with a few houses', and in 1892 the annual gold fields report stated '…this part of the field has a prosperous future before it; as it is, the population has increased very largely, the township that was laid off by the Government surveyor proving too small already; houses are going up, and this is general test of the progress of any district' (Figure 40 and Figure 40)[193] Essential services soon followed which included the opening of Waihi's first school in 1890, and a Post Office Savings Bank (1892), along with several notable businesses: Thomas Vulgar, Butcher (1892), Archibald Clark, storekeeper and fruiterer (1892), Ernest McLeay, boot and shoe manufacturer (1893), Cullen and Co., drapers and importers (1893), Edwards and Tower, painters and decorators (1894), and William Robbins, chemist (1896).[194] Places of worship were also constructed around the township and comprised the original St John's Anglican Church (at the corner of Gilmour Street and Seddon Street) built in 1894, a Wesley Methodist Church erected in Haszard Street in 1898, and a Presbyterian Church Hall built in 1896.[195]

Expansion necessitated further surveying of the Waihi area and a plan of the Township of Waihi, dated July 1895, shows proposed subdivision over large central portions. Other unsurveyed areas are simply labelled 'residence sites' and a report from the Department of Lands and Survey, to the year ending March 1896, noted that 'A start was made with the

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[188] *Bay of Plenty Times*, 13 October 1881, p.3.
[189] AJHR 1892 H-19, p.10.
[190] Barber 1985, pp.73-74.
[191] Ibid., p.75.
[192] *Bay of Plenty Times*, 7 August 1890, p.3.
[193] Barber 1985, p.77; AJHR 1892 C-03A, p.6.
[194] Climie 1962, pp.7-8 & 147.
[195] Ibid., pp.118-119.

survey of the Waihi goldfield township; but, owing to the illness of the surveyor, and the multitude of residence sites granted and overlapping the streets in all directions, it was temporarily abandoned; but I hope to complete Waihi, and lay off before long a township at Waitekauri also.'[196] Mr. Haszard was appointed to carry out further surveying of Waihi and his progress was related through the Paeroa Warden's Court in May 1896:

> 'Before the ordinary court business commenced, the Warden made reference to the long delayed plan of Waihi township, and mentioned that he had an interview at Thames with Mr Hazard, Surveyor, and Mr Wilson, Mining Inspector, and Mr Jordan, Clerk of the Court, and they had given Mr Hazard all the information in their power, also lending him two old plans of the Waihi township. Mr Hazard's intention is to prepare a plan in sections, and a tracing of each section, as completed, will be left at Waihi and Paeroa, so that residence sites, etc., may be applied for on these sections.'[197]

It is unclear when Haszard completed his survey of the Waihi Township; however, an Index Plan of Waihi, compiled from plans in the Paeroa Warden's Court and dated 1899 (and corrected to 1901), shows the formation of the town to that date with reserves for goldmining purposes, special sites, sections granted and mining properties detailed. The plan also revealed the names of the main streets throughout the township, including: Haszard Street (likely after M.F. Haszard, the early surveyor of the town); Moresby Avenue (after T.A. Moresby, Mining Registrar at Paeroa); Seddon Street (after the Right Hon. Richard John Seddon; formerly Main Street and before that Waihi Street); Kenny Street (after H. Eyre Kenny, Warden and Magistrate); and Gilmour Street (after Thomas Gilmour, Mine Manager).[198]

At the turn of the century the Waihi Township was still regarded primarily as a gold mining camp, with huts and cottages spread out 'over an area of about three miles each way', poppet heads visible in every direction, and the main streets 'intercepted at many points by the tramlines communicating between various mines and batteries' (Figure 41 to Figure 44).[199] Waihi became a separate Borough in 1902 and the first Mayoral election took place on 7 April that same year.[200] Mr W.H. Phillips was appointed Mayor and Mr H.H. Morpeth as Town Clerk, with a further eight councillors completing the Waihi Borough Council.[201] During its early years, the Waihi Borough was, in area, the largest in the North Island and contained more roadways than any other Borough (excepting Whangarei), with 160 kilometres of formed footpaths.[202]

The town continued to develop according to the vicissitudes of the mining industry, experiencing boom years from 1902 to 1910 and then more moderate growth (Figure 46 and Figure 46). An index plan of the Waihi Township, dated 1909, shows the spread of residential and business subdivision amongst mining sites by that date, and a sketch map

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[196] AJHR 1896 C-01, p.36.
[197] *Auckland Star*, 5 May 1896, p.5.
[198] Climie 1962, pp.123-124.
[199] Cyclopedia Company Limited, The Cyclopedia of New Zealand [Auckland Provincial District], Christchurch, 1902, p.917.
[200] Ibid., p.16.
[201] Ibid.
[202] Ibid.

of Waihi 'Past and Present', shows various features within the Waihi landscape from the late 19th century to 1962 (Figure 47 and Figure 48).

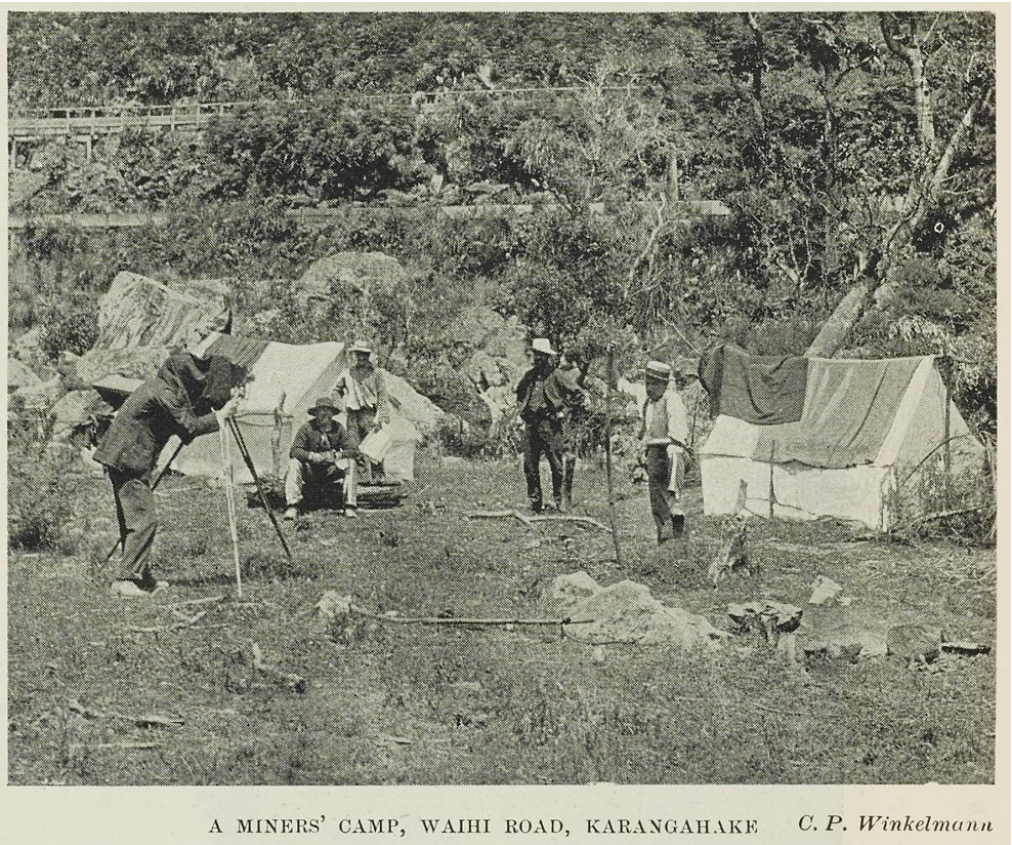

Figure 36. Photograph, dated 20 May 1899, showing a gold miner's camp along the Waihi Road at Karangahake with tents visible in the background (source: Sir George Grey Special Collections, Auckland Libraries, NZG-18990520-671-4)

Figure 37. Photograph, dated 21 December 1900, showing a Waihi gold miner's hut or shanty (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19001221-5-4)

Figure 38. Photograph, dated 29 August 1901, showing a Waihi gold miner's hut or cottage (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19010829-10-5)

Figure 39. Two versions of plan 6474, dated 1890 (top left) and January 1892 (at right), showing the Township of Waihi with the school reserve and businesses identified (source: Quickmap)

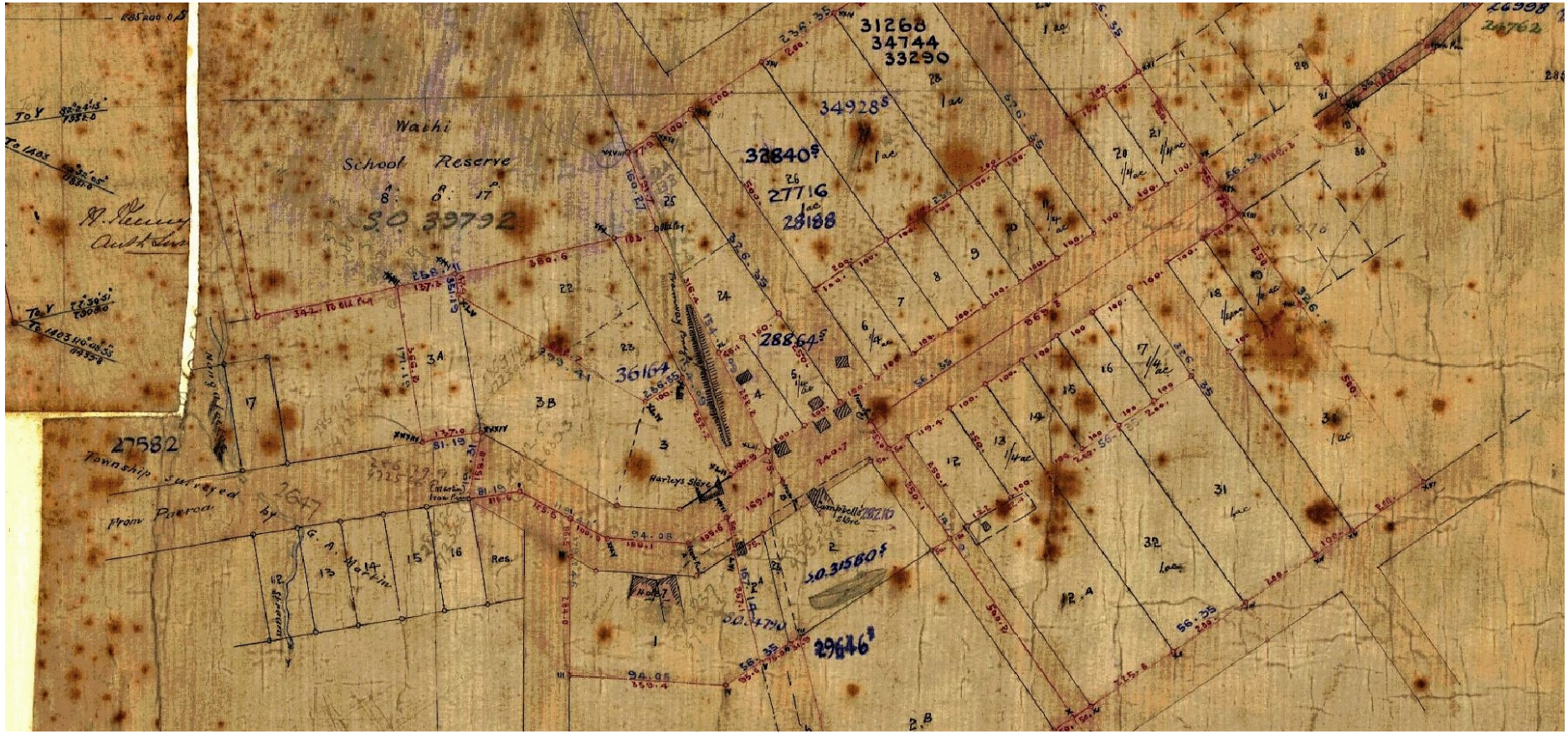

Figure 40. Close-up of plan 6474, dated January 1892, showing the Township of Waihi with the school reserve and businesses identified (source: Quickmap)

Figure 41. Photograph, dated 10 November 1899, showing the main street of the Waihi Township (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-18991119-5-1)

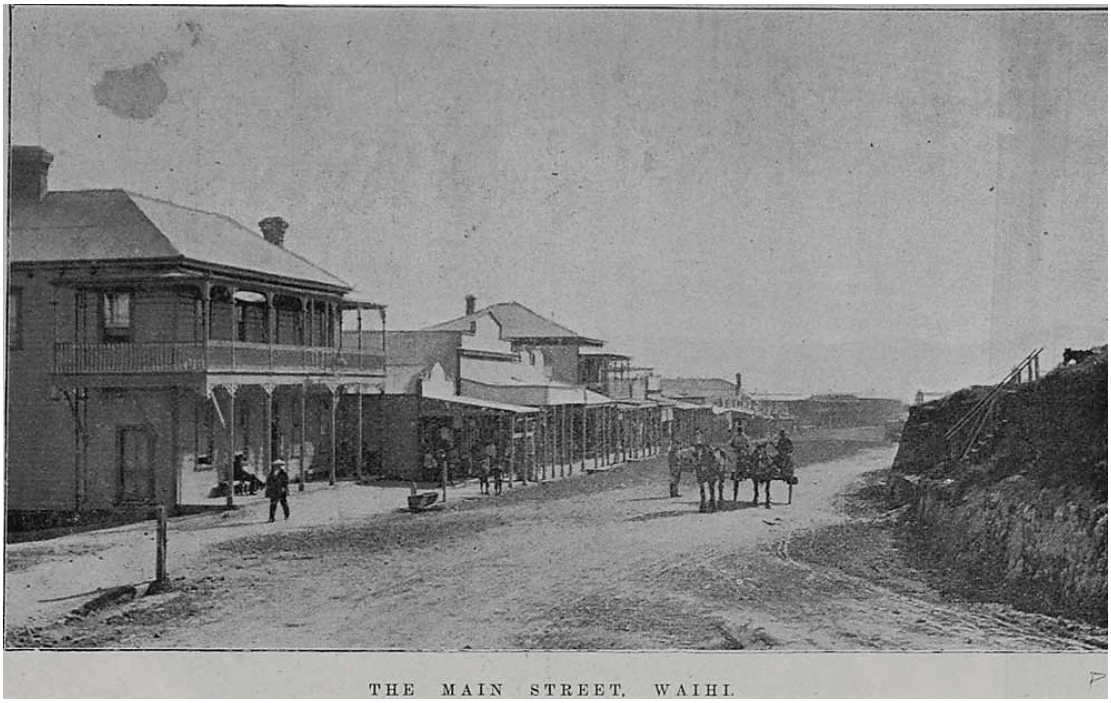

Figure 42. Photograph, dated 14 December 1900, showing the main street of the Waihi Township (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19001214-4-1)

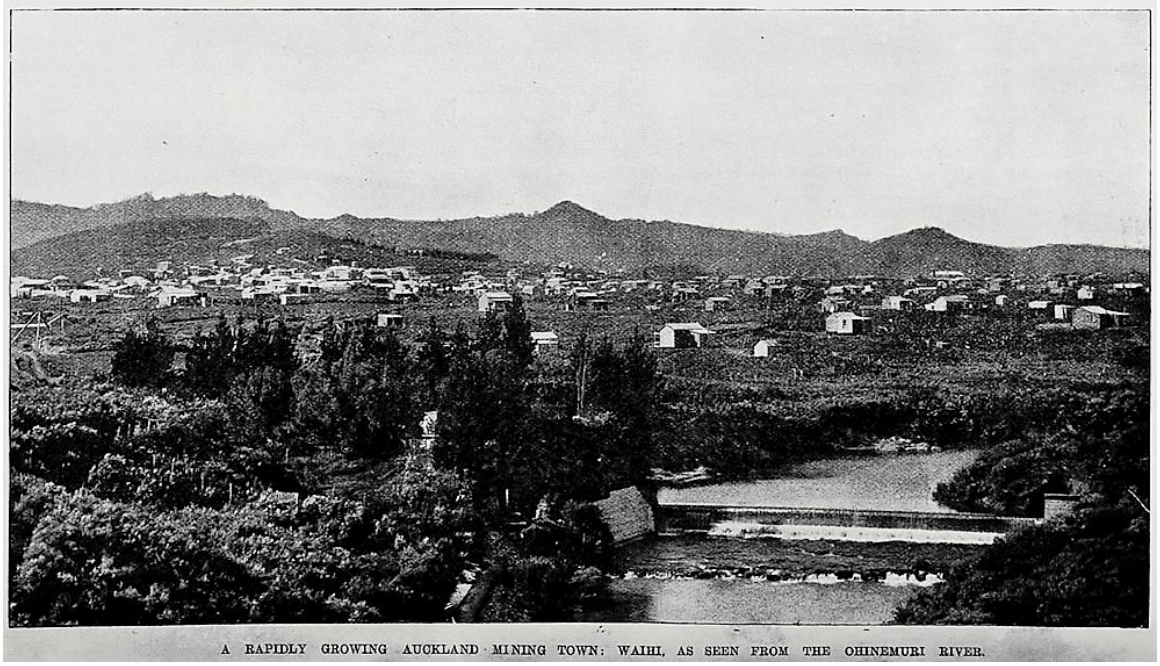

Figure 43. Photograph, dated 3 May 1901, showing Waihi Township from the Ohinemuri River (foreground) (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19010503-11-4)

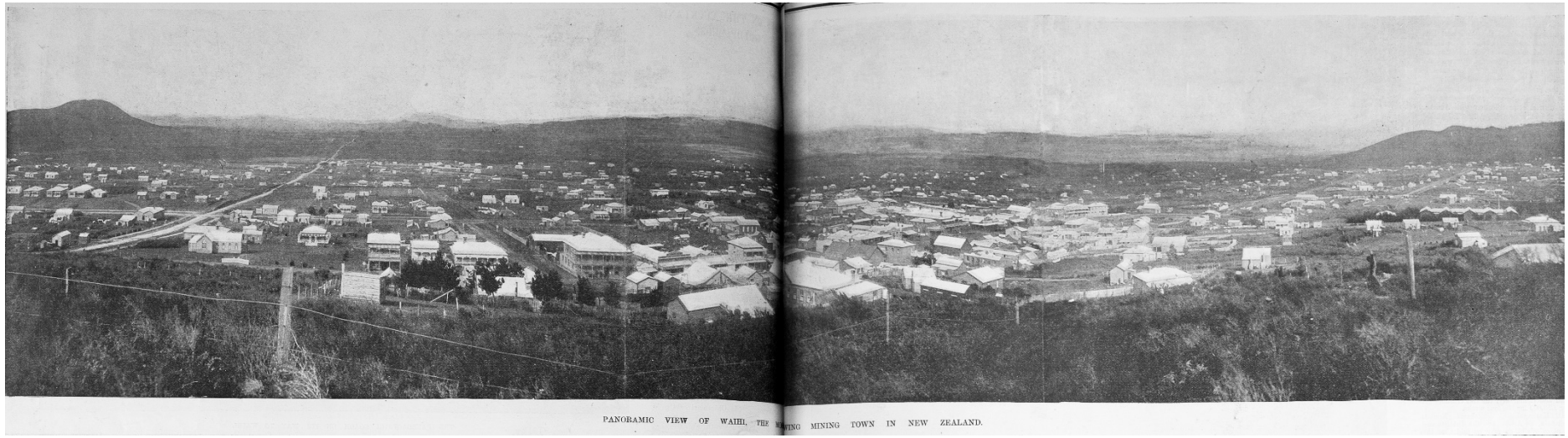

Figure 44. Panoramic photograph, dated 29 August 1901, showing the Township of Waihi (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19010829-6-1)

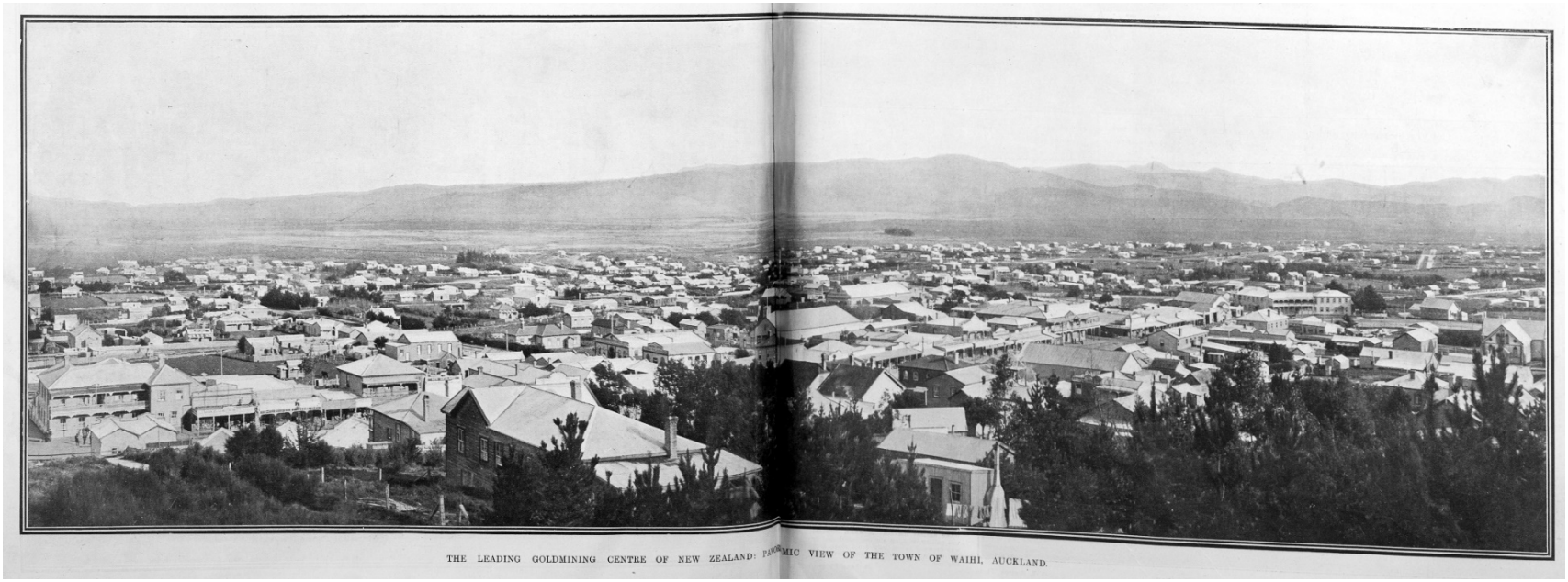

Figure 45. Panoramic photograph, dated 19 September 1907, showing the Township of Waihi (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19070919-6-2)

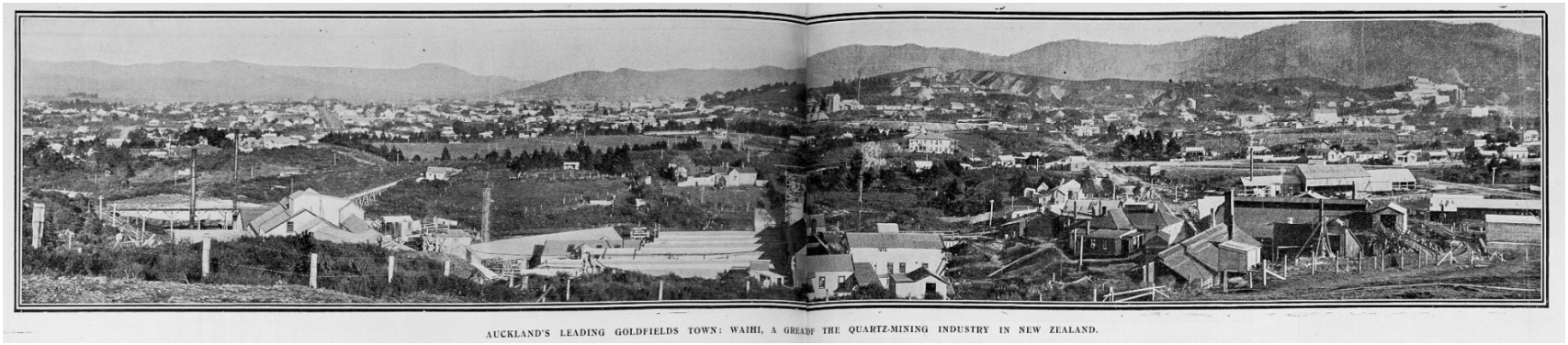

Figure 46. Panoramic photograph, dated 30 September 1909, showing the Township of Waihi (source: Sir George Grey Special Collections, Auckland Libraries, AWNS-19090930-9-)

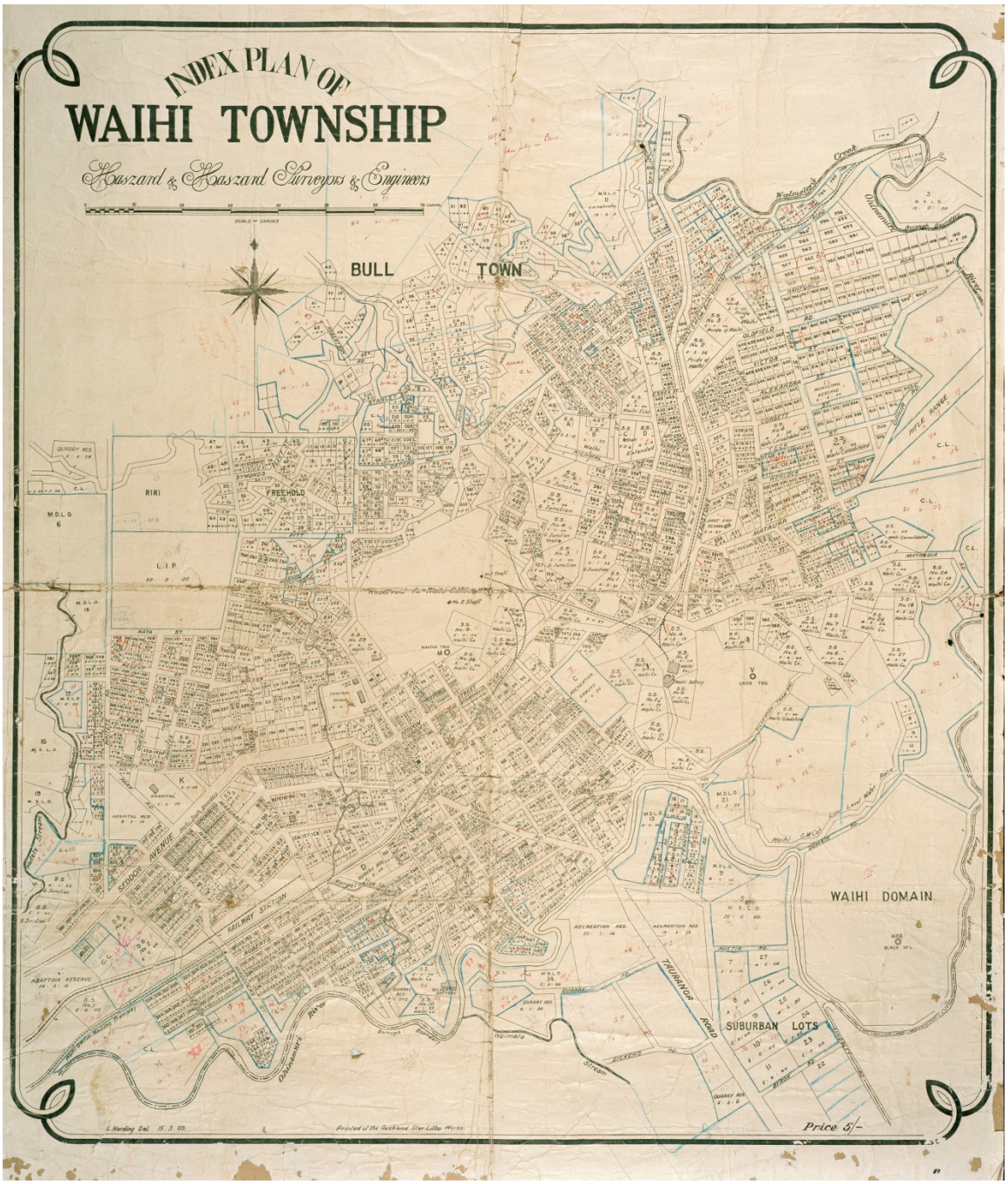

Figure 47. Index plan of Waihi Township, dated 1909, showing subdivision and mining areas (source: Sir George Grey Special Collections, Auckland Libraries, NZ Map 3604)

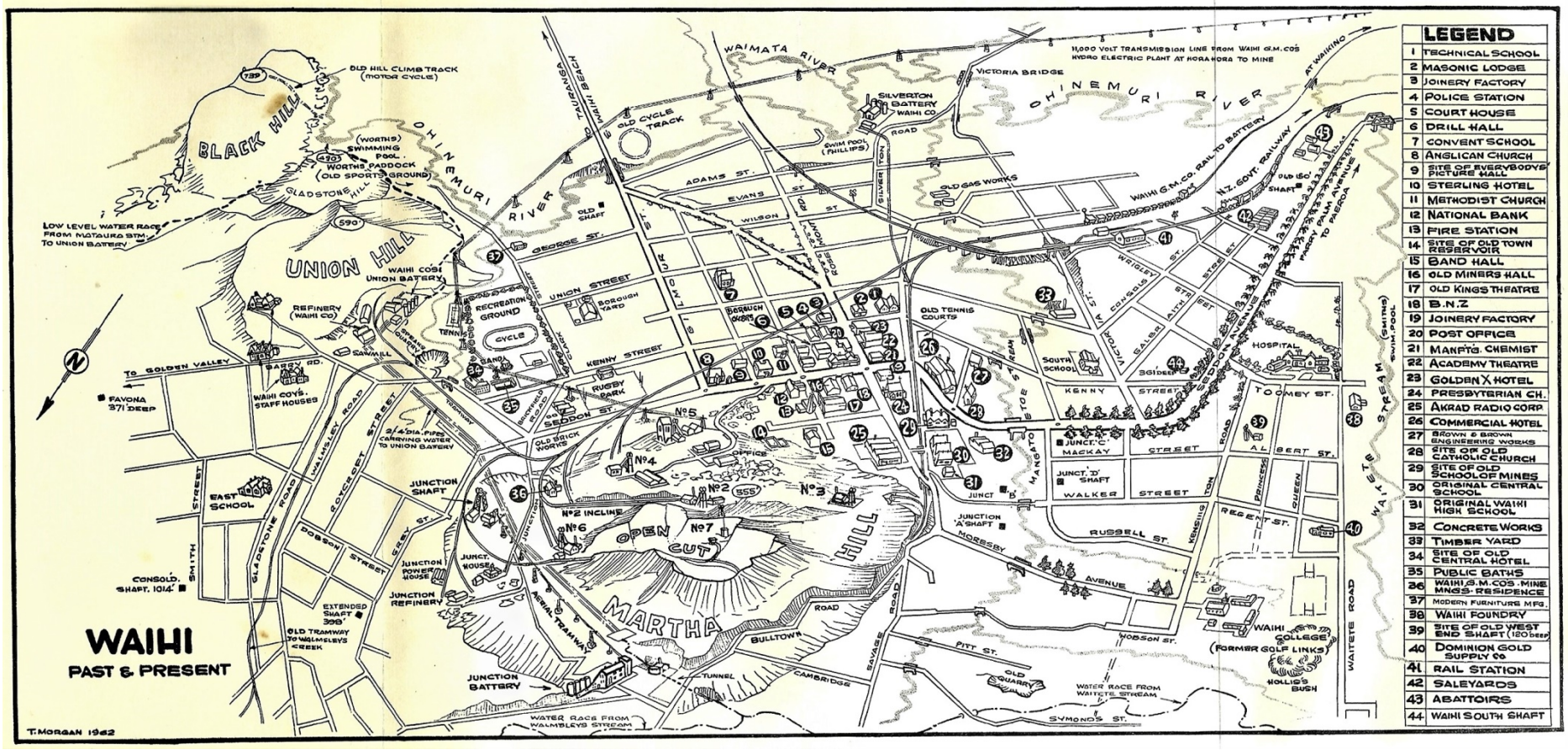

Figure 48. Sketch plan of Waihi Township past and present, dated 1962, with feature identified (source: Climie 1962: np)

Later History Waihi

The PYE (NZ) Ltd Factory

The land on which the PYE (NZ) Ltd Factory stands at the corner of Moresby Avenue and Martha Street, Waihi, is formed of Section 92, Town of Waihi. The section is visible on a plan of the Waihi Township, dated 1909 (NZ Map 3604 – Figure 47), although not in its present layout. In 1919 Section 92 was included on a plan of a residence site (SO 20650) which indicated two extant buildings within the property. It is unclear who constructed the buildings; however, a residence site license was granted to Jeremiah Hirst, a laundryman, for the land on 28 November 1919.[203] Following Hirst's death in 1922, ownership of the property, granted for a term of 42 years, remained in the Hirst family, eventually passing to Eric Maurice Hirst and then to Lily Kate Hill.[204] Hill changed to her married name, Bjerring, in 1953 and transferred the interest of the residence license for Section 92 to the Akrad Radio Corporation Ltd on 26 November 1954.[205]

The Akrad Radio Corporation Ltd was founded by K.M. Wrigley, who was born in Waihi in 1913.[206] Wrigley moved to Auckland after finishing high school, where he worked with Johns Ltd and obtained his Radio Serviceman's certificate.[207] He returned to Waihi in 1932 and established a radio sales and repair shop in lower Seddon Street where he worked with his brother. Wrigley began the manufacture of his own radios, which were cheaper to build than to buy, and trade prospered. By 1939 Wrigley employed 50 persons and the business was obliged to move to larger premises. The name Akrad (an abbreviation of Auckland Radio) was first used from around this time and Wrigley promoted sales by frequently travelling around the North Island.[208] During the Second World War the government disallowed the manufacture of domestic radios and Akrad was contracted to produce army radios, spare valve cases, signal lamps, Morse keys, and buzzers for defence purposes.[209] Staff numbers increased to 90 during the War years and the firm was relocated into the King's Hall in Haszard Street. From the mid-1940s Akrad diversified by producing children's tricycles and arranged for a separate marketing organisation to sell the new enlarged factory output.[210] Wrigley died shortly afterwards, in 1946, and the business passed to the Public Trustee who administered Akrad on behalf of the estate until 1947 when it was purchased by a group of shareholders. A limited liability company was formed under the name of the Akrad Radio Corporation Ltd and in 1951 Pye (N.Z.) Ltd (manufacturers of televisions) acquired a controlling interest in the business.[211] The Waihi factory produced Pye domestic radios along with the established brands of Regent, Pacific and Five Star, and from the 1950s additional products were also manufactured, including: mobile radio telephones and related telecommunications equipment, New Zealand's first single-cabinet stereograms, transistorised radios and the use of printed circuits.[212] The

[203] SA3C/167, LINZ.
[204] Ibid.
[205] Ibid.
[206] Nellie Scott Climie, Waihi Borough Council Diamond Jubilee¸ 1902-1962, Paeroa, 1962, p.161.
[207] R.E. Skinner, 'Akrad Radio Corporation', *Ohinemuri Regional History Journal*, 9, May 1968.
[208] Ibid.; Climie 1962, p.161.
[209] Ibid.
[210] Ibid.
[211] Ibid. Pye (N.Z.) Ltd was set up by Pye Ltd., of Cambridge, England who retained substantial shareholdings in the new company.
[212] R.E. Skinner, 'Akrad Radio Corporation', *Ohinemuri Regional History Journal*, 9, May 1968.

production of television sets was a significant development for the company and Skinner notes:

> 'When the Queen visited New Zealand in 1953-54, Pye brought to New Zealand a complete television transmitting station which for several years remained the only demonstration unit of its kind in the country. Waihi's Rugby Park was the scene of New Zealand's first outside television broadcast, which Akrad engineers staged for a Harlequins versus Barbarians Rugby match in 1954. The telecast, complete with commentary on play, was viewed by hundreds on Pye sets placed around the field, in the Waihi hospital and several private homes. Later an exhibition studio was built to house the equipment as a feature of the 1954 Auckland Easter Show, from which telecasts were made to Pye sets specially installed in Green Lane Hospital and several private homes in Auckland. Akrad provided engineers to run and supervise this equipment.'[213]

From 1958 to 1960 the Akrad factory at Haszard Street was enlarged and further stock, machinery and motor vehicles purchased; however, it soon became apparent that the premises would be unable to provide the area needed to produce television receivers. A contract was let for the construction of a new plant in Moresby Avenue, on Section 92 Town of Waihi. The interest in the residence license over the land had been transferred from Lily Bjerring to the Akrad Radio Corporation Ltd in 1954, although it is unclear how the land was utilised prior to the erection of the factory.[214] The new Akrad plant covered an area of 56,000 square feet and was opened in 1962 (Figure 49) at a cost of £160,000.[215] Details of the interior are provided by Climie:

> 'The building faces Moresby Avenue and consists of large comfortable offices on the ground floor with staff locker rooms and other amenities on the first floor. A large modern cafeteria overlooking Martha Street, with up-to-date kitchen, has a seating capacity for over 200 persons. An area of 40,000 square feet on the first floor is used for the assembly of Television, Radio Telephone and Radio Receivers. The "saw-tooth" design of this area affords an abundance of natural lighting and temperature is controlled by four modern units placed at strategic points. Every effort has been made to bring the working conditions up to the very highest standard. A feature of the building is the roadway which passes through it, allowing vehicles to unload under cover on the same level as the factory floor. Access and egress to and from the building is made through entrances which incorporate electrically operated roller type doors. Fire protection is provided by a Sprinkler installation which served the entire building.'[216]

In conjunction with the new factory a Technical Laboratory was also opened on a site in Barry Road at the end of 1962.[217] Several other subsidiary plants also operated in Hamilton and Paeroa between 1960 and 1983.[218]

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[213] Ibid.
[214] SA3C/167, LINZ.
[215] R.E. Skinner, 'Akrad Radio Corporation', *Ohinemuri Regional History Journal*, 9, May 1968; Auckland Libraries, New Zealand Scrap Book, September 1962, p.205 & 208.
[216] Climie 1962, pp.161-162.
[217] Ibid., p.162.
[218] PYE-New Beginnings, Waihi New Zealand's Heart of Gold website, accessed via: http://www.waihi.org.nz/about-us/history-and-heritage/the-pye-story/pye-new-beginnings/

A certificate of title for the land on which the Moresby Avenue factory stood (Section 92, Town of Waihi) was issued to the Akrad Radio Corporation Ltd in 1976 and then transferred to Philips Electrical Industries of New Zealand in 1984.[219] The property was subsequently transferred to Cottbiu Holdings Ltd in 1989, to William and Adrienne Lynch and Martin van der Wetering in 1990, and is currently under the ownership of Oceana Gold (New Zealand) Limited.[220]

Building Relocations

Due to the increasing instability of the landscape on which certain historic mining buildings remained into the 21st century, relocation was necessary for the Cornish Punphouse/Martha Mine No. 5 Pumphouse (NZAA T13/301) and the Grand Junction Refinery (NZAA T13/314), as well as remnants of the transformer house (T13/302) (Figure 50-Figure 52). Strengthening works in the form of internal bracing were carried out on the Cornish Pumphouse in early 2006 and a causeway constructed of teflon-coated concrete beams. Relocation of the 1840-ton pumphouse began in August 2006 and the building reached its new site, 300 metres away, in November that same year.[221] In 2010 work began on moving the Grand Junction Refinery. Relocation of the 180-ton building was achieved using a causeway which allowed the structure to be moved 100 metres to a site within the Pit Rim Walkway. Work was completed in June 2010 and included the relocation of the concrete bullion store (via crane and low loader) to a site near the refinery.[222]

Poppet Head Replica

An 18-metre tall replica poppet head was installed at the junction of Gilmour Road and Seddon Street on 12 December 2000. The structure was funded by a grant from the Waihi Gold Company and constructed from 9-metre long Australian hardwood. A blessing ceremony was held at the site on 30 January 2001 where the poppet head replica was 'dedicated to the memory of the people who, in the past, have made the town of Waihi what it is today, particularly the miners who worked the underground mines.'[223]

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[219] SA20B/651, LINZ.
[220] Ibid.
[221] 'The Cornish Pumphouse', Oceana Gold Waihi Operation website, accessed via: http://www.waihigold.co.nz/about/history/the-cornish-pumphouse/
[222] 'Grand Junction Refinery Building: "On The Move" In 2010', Oceana Gold Waihi Operation website, accessed via: http://www.waihigold.co.nz/about/history/grand-junction-refinery/grand-junction-refinery-building-on-the-move-in-2010/; 'The Grand Junction Refinery', Newmont Mining poster webpage, accessed via: http://s1.q4cdn.com/259923520/files/doc_downloads/australia/waihi/grand-junction-refinery-posters.pdf
[223] 'Waihi Streetscape', *Ohinemuri Regional History Journal*, 45, September 2001, accessed via: http://www.ohinemuri.org.nz/journals/73-journal-45-september-2001/1648-waihi-streetscape

Figure 49. Pye/Akrad building Moresby Ave (1967) (source: Waihi Museum)

Figure 50. View west of original pumphouse site and future location at end of formed accessway upper left (source: Newmont Waihi Gold photo 2006)

Figure 51. View west of transformer house prior to demolition from top of pumphouse (in original location), gas engine foundations and compressor pads (being drilled for explosives) this side of transformer house (source: Newmont Waihi Gold photo: 2006)

Figure 52. Grand Junction Refinery building and strong room being prepared for relocation in 2010 (source: http://www.waihigold.co.nz/about/history/grand-junction-refinery/grand-junction-refinery-building-on-the-move-in-2010/)

PAST ARCHAEOLOGICAL INVESTIGATION

Given the long Maori occupation of the area, the significant historical mining landscape and associated settlement of Waihi, it is not surprising that there have been numerous archaeological investigations in the past. Figure 53 is a plan showing past archaeological surveys that have been undertaken in the Waihi area. This map was produced in 2010 so there has been additional survey work and new archaeological sites recorded since this time (see Part 2 report). In addition to survey work, other archaeological assessments and excavations have also been carried out. Some of the most relevant archaeological investigations within the Waihi area are summarised below, moving approximately west to east. It is acknowledged that this is not a complete summary of all archaeological work undertaken and there may be other smaller investigations that have occurred in the general Waihi area.

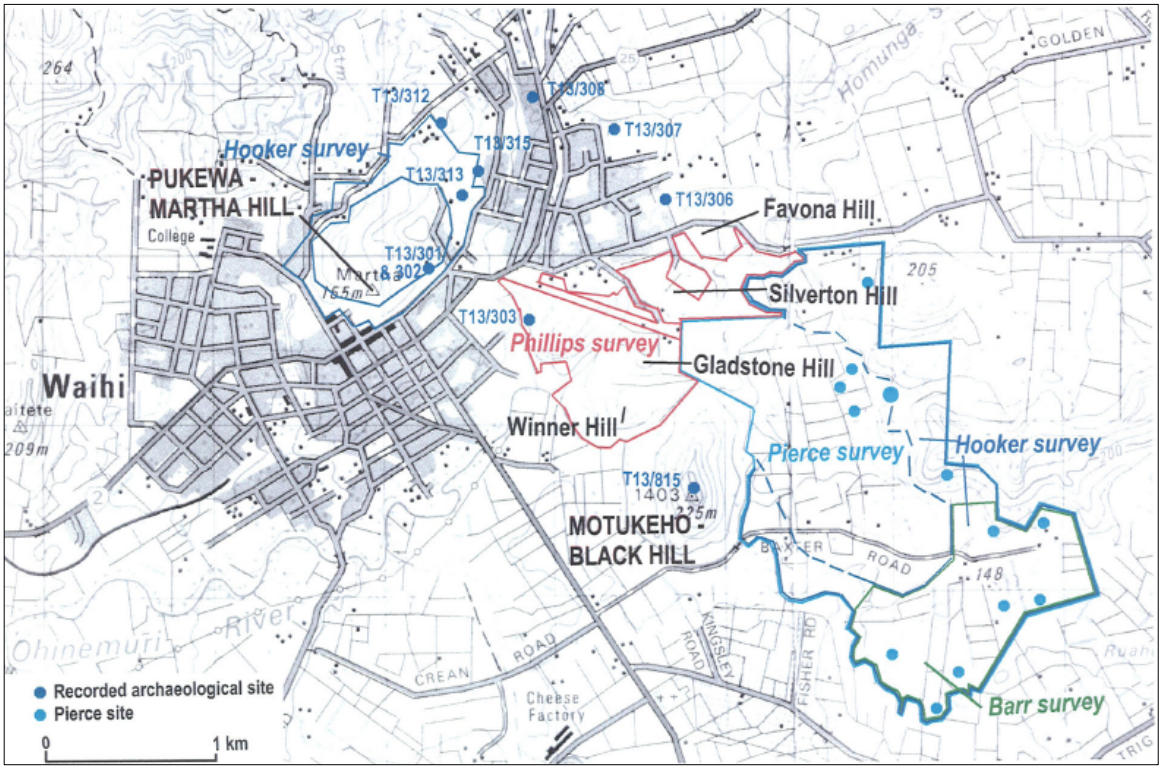

Figure 53. Previous archaeological surveys within the Waihi area and archaeological sites that were recorded in 2010. Note that there are now additional sites recorded on the NZAA Archsite database as a result of more recent investigations (source: Phillips C, 2010, Figure 1)

Pukewa / Martha Hill

The Cornish Pumphouse and the nearby transformer house at Martha Pit were recorded as archaeological sites (NZAA T13/301 and T13/302 respectively) by Neville Ritchie in 1990 (Hooker 2007:2). A 1997 survey was undertaken by Ray Hooker of the Martha Mine site, which identified several historic mining sites and houses around the mine and within the town. The area of No. 5 Mine shaft was mapped in 2002 (Figure 54) and in 2003 a conservation plan was prepared for the Cornish Pumphouse (Salmond Reed Architects 2003). This report recognised the risk to the Pumphouse arising from ground instability and assessed a number of different options, including maintaining the structure on its original location, relocating the structure, or construction of a replica building.

Between 2003 and 2006 it was decided to relocate the Cornish Pumphouse, due to the risk of catastrophic failure and loss of the building if unstable ground collapsed in its original location. A 2006/2007 investigation of the Martha Pit mine extension was undertaken by Ray Hooker under Heritage NZ Authority 2006/132 for relocation of the Cornish Pumphouse to its present site (Hooker 2007). The investigation covered the original location of the Cornish Pumphouse and No. 5 Mine shaft (NZAA T13/301), and any sites along the transfer route and relocation site (Figure 55). The investigation revealed numerous industrial features and foundations associated with early mining activity, as well as the remains of domestic house sites at the receiver site for the Pumphouse.

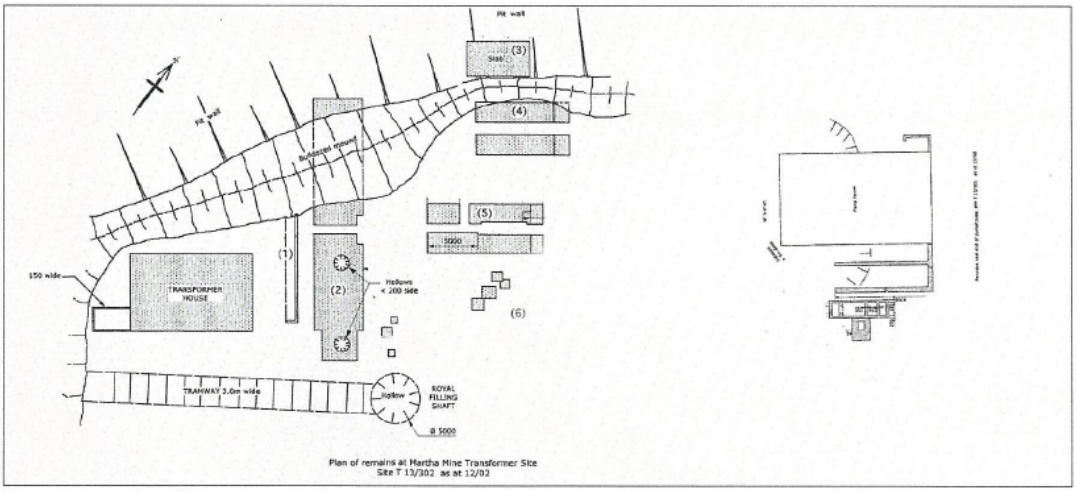

Figure 26 Martha Hill Pumphouse in the context of its wider immediate site, 2002 *Trevor Thompson, Hooker Report*

Figure 54. Plan of Martha Hill Pumphouse, transformer house and other associated structures (Salmond Reed Architects 2003)

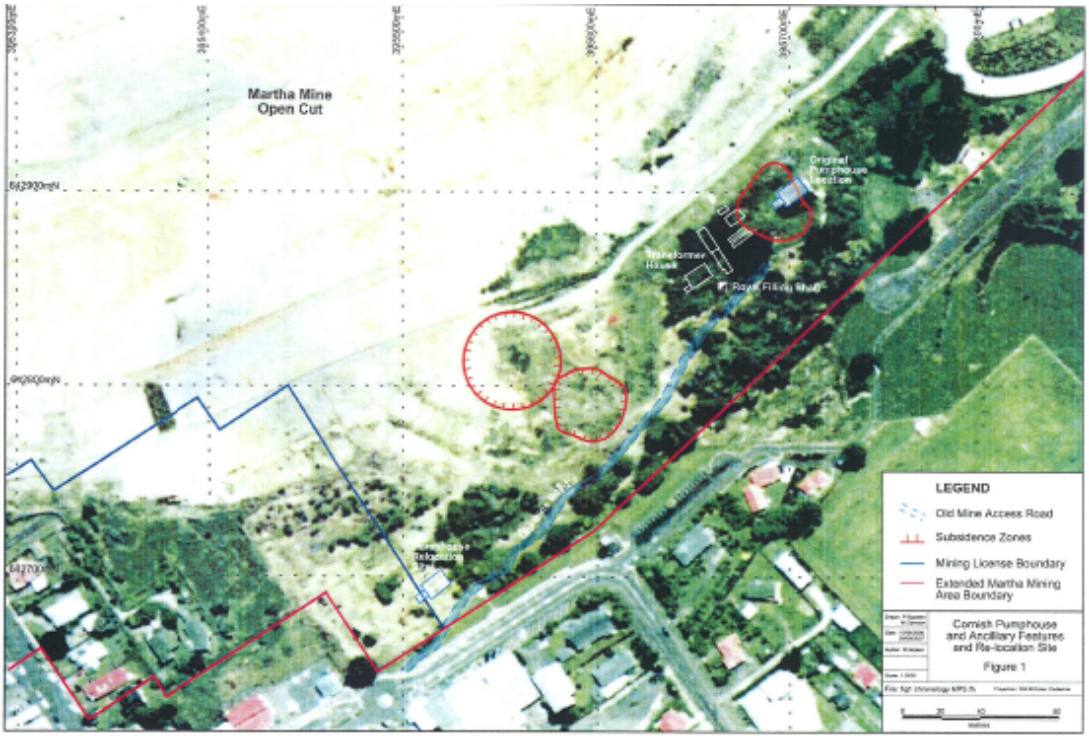

Figure 55. Archaeological investigation at Martha Hill by Hooker in 2007 (source: Hooker 2007: 4)

Grand Junction

Neville Ritchie (Department of Conservation (DOC), Hamilton office) carried out a brief site survey of the Grand Junction mine remains in 1990 as part of an archaeological survey of Waihi and Thames mining areas. Ritchie recorded the Grand Junction battery site as T13/312, including the nearby strong room. A small quarry to the west was given a separate site number, T13/315. Ritchie recorded the Grand Junction boiler and powerhouse as T13/313 and the Grand Junction Refinery building as T13/314 (Hooker 2010a:4). The area was also covered by Hooker in his 1995-1996 survey of the Martha Pit (Hooker 1997).

A structure survey of the Grand Junction boiler house and powerhouse ruins was undertaken by Wright and Hooker in 1998 (Wright and Hooker 1998), with features mapped in detail and locations determined by company surveyors. A draft conservation and management plan was prepared by Ray Hooker for the Grand Junction Refinery Building at this time.

As part of the Martha Mine Extension Project the Grand Junction mine manager's house was sold and relocated to Symonds Street in Waihi. The area surrounding the Grand Junction Refinery Building was used as an ore stockpile, burying the foundations of the mine manager's house.

Parts of the Grand Junction powerhouse were impacted by the new eastern noise bund and new perimeter road. Reports on the Grand Junction Boiler House (T13/313) and earthworks monitoring during relocation of the Grand Junction Refinery Building were prepared by Ray Hooker in 2010 (Hooker 2009, 2010a, 2010b). These investigations revealed remains of tramways and water features relating to mining activity and numerous other features and foundations associated with manufacturing processes at the Grand Junction powerhouse site (Figure 57 and Figure 57). The noise bund buried the foundations of other mining

related buildings and the site of the Grand Junction No. 1 and 2 shafts were also capped (Hooker 2010a: 5).

Following its relocation, a conservation management plan was prepared for the Grand Junction Refinery Building and Strong Room by Brigid Gallagher as part of a resource consent condition (Gallagher 2011). The conservation plan provided recommendations and policies on the long-term management of the two buildings, including weather protection, a maintenance programme, and a concept plan for public access and interpretation.

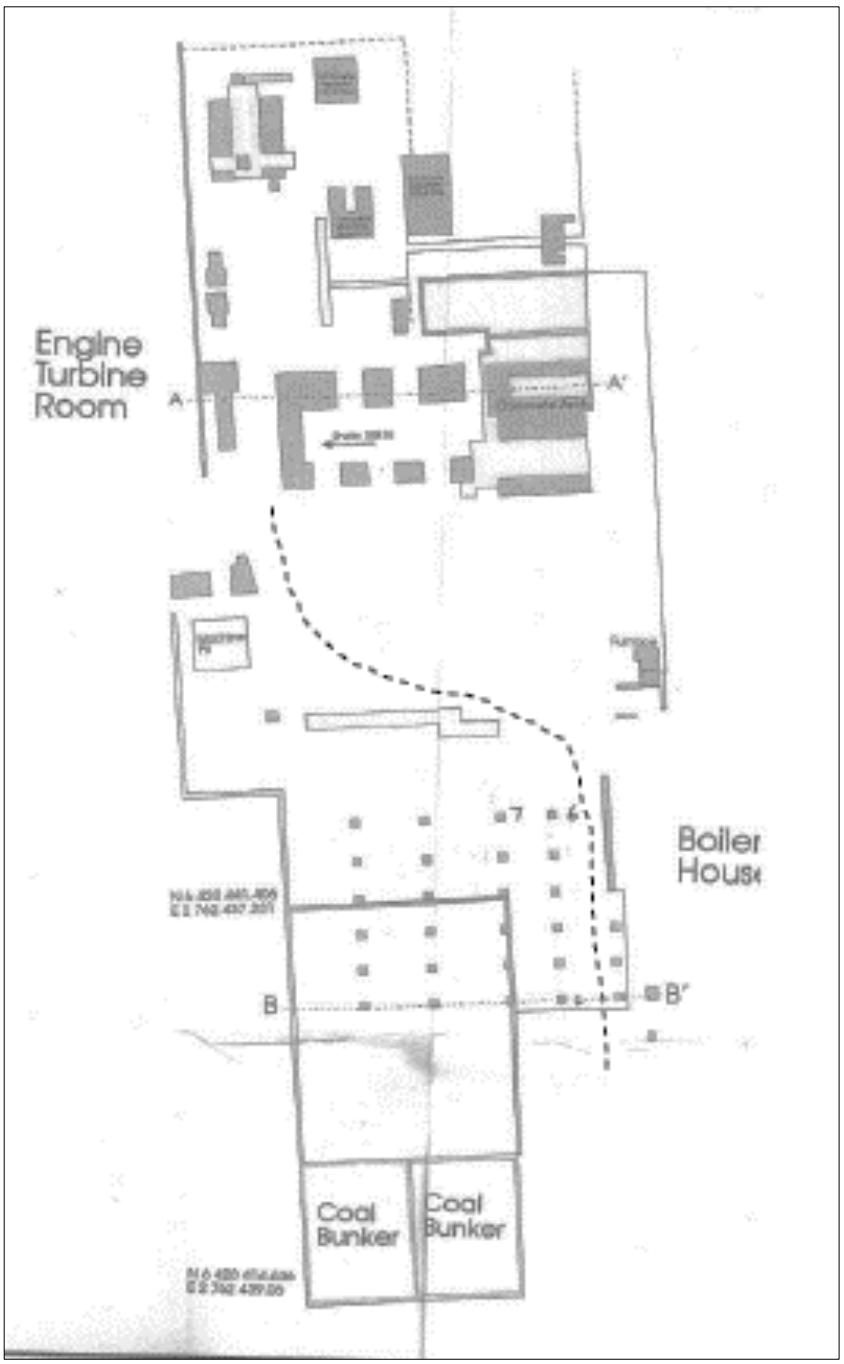

Figure 56. Grand Junction Remains, showing the powerhouse to the north and boiler house to the south, recorded during 1997 (source: Hooker 2010a; Figure 1)

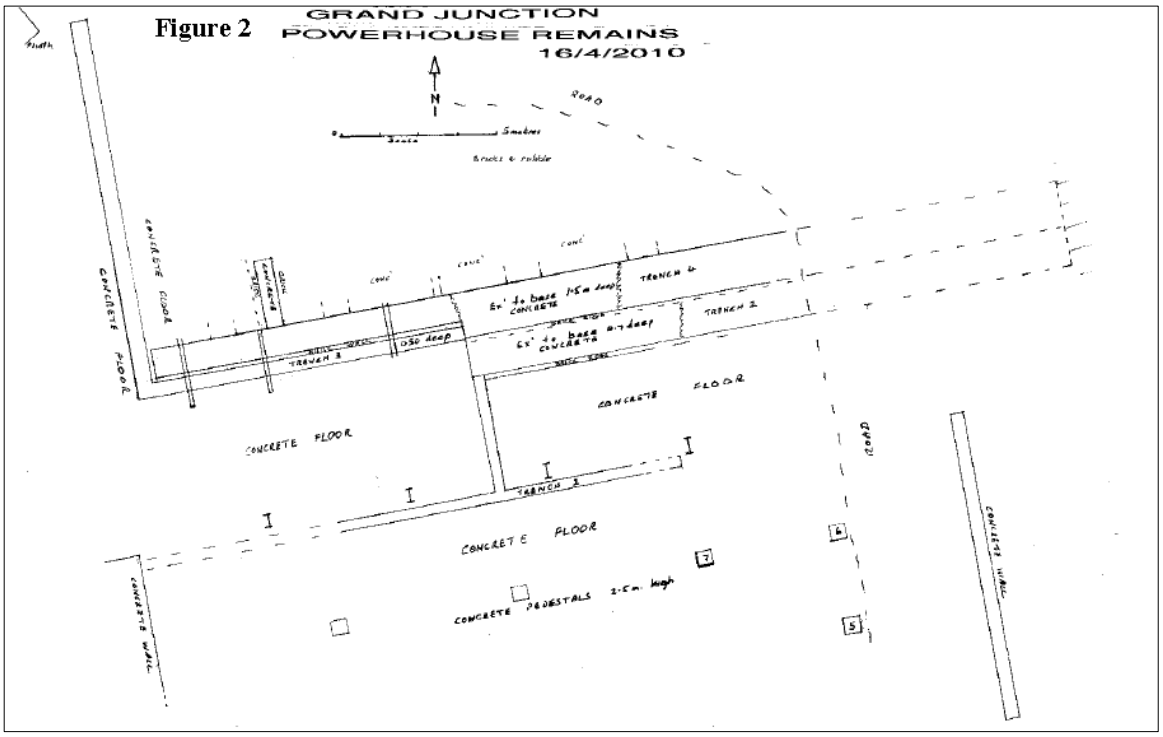

Figure 57. Grand Junction boiler house remains recorded in 2010, showing the north part of the boiler house investigated (source: Hooker 2010a: Figure 2)

Union Hill

In 1988 Neville Ritchie undertook a survey of historic mining features in the area to the north and west of the town, including the Union Battery and cyanide tanks or 'pachuccas' (NZAA T13/303). Several features identified in the project area, including mine shafts at Silverton, Union and Gladstone Hill, were recorded in a book on gold mining in the Coromandel Peninsula (Moore & Ritchie 1996). Ritchie and Phil Moore also described the Union Hill/Waihi in-ground ore-roasting kilns (Moore & Ritchie 1998). A 1997 paper on the Union Battery ruins by Pamela Wright described the Union Hill kilns, Cyanide tanks, and the concrete strongroom (Wright 1997). A 2000 survey by Dr Caroline Phillips confirmed the locations of previously recorded in-ground ore roasting kilns (NZAA T13/823), and collectively recorded several features relating to early mining activity as an archaeological site, NZAA T13/822 (Phillips 2000).

A conservation plan was prepared for the Union Hill site (Moore et al. 2010). The plan covers the whole of the Union Hill historic landscape, including the land managed by LINZ, DOC and HDC, but excludes the Keatley property subsequently acquired by WGCL (Figure 58). The conservation plan has the objectives of 'protecting and preserving all significant historic sites and features in the area; retaining the "character" of the place; removing immediate threats (to the remains); promoting improved public access and appreciation of the historic heritage; promoting opportunities for community involvement in conservation and research; and ensuring future development of the place is compatible with its cultural heritage significance'. Key recommendations of the plan (p. 121) are:

- the preparation of a management plan for the entire area, 'to ensure appropriate care and protection of historic remains, proper vegetation management, and the implementation of a regular maintenance programme' (1.1); and
- the establishment of a management group 'to oversee the implementation of both the conservation plan and management plan. This should consist of representatives from at least the main stakeholders (Newmont, LINZ, DOC, HPT [now Heritage NZ], Waihi Walkways.

An archaeological assessment of the proposed works at the Trio Vent shaft on Union Hill was undertaken by Clough & Associates (Clough & Macready 2011). An Assessment of Environmental Effects (AEE) was prepared for proposed upgrades to walkways and interpretation, and for other works in 2012 (Waihi Gold 2012a, 2012b).

An archaeological authority was approved under Section 18 of the Historic Places Act 1993 (reference 2012/542) to undertake defined works within the Union Hill Historic Area (T13/822) (Gallagher 2017). The aim was 1) To understand the condition of the mining remains remaining in the Union Hill Historic Area and 2) To better manage the Historic Area in the future (ibid). Not all of the works under this authority have been carried out. To date this has consisted of one trench excavated in 2013, which exposed the concrete Vat House floor, found to be in fair to moderate condition (ibid). There has been monitoring of the partial formation of the walkway loop and erection of bollards at the entrances of Barry Road and Clarke Road (Figure 59).

In 2016 a detailed heritage landscape management plan was prepared by Clough & Associates (Macready & Clough 2016). This management plan identified five recorded archaeological sites within the Union Hill area, which are shown in Figure 58. It was noted in the Clough & Associates report that the extent of most sites is not clearly defined, and there is a good deal of overlap between recorded sites in terms of which features they include. Furthermore, Macready & Clough (2016) highlighted that the full extent of the archaeological remains surviving on Union Hill is not known. The Waihi Battery area was bulldozed and flooded with 1m or more of tailings during the 1970s–1980s, and additional unrecorded elements are likely to be concealed beneath vegetation growth, tailings, spoil and soil build up (ibid.). However, the main surviving structures are clearly evident, and areas of structures and mining activity are recorded in various archival plans, photographs and survey plans (Figure 60 - Figure 62; Moore, Lens & Ordish 2010; Clough, Best & Hooker 2004).

The heritage management guidelines and procedures set out in the plan relate to:

- the planning and undertaking of any new works related to mining;
- the potential effects of the Trio underground mining operation;
- maintenance and conservation of the heritage remains;
- visitor use and amenities; and,
- research.

None of the proposed conservation work to the structures (set out in the plan) have been done, although during recent site visits by the authors it was evident that some of the paths have been upgraded (as presented in the Gallagher 2017 report). Most recently there has also been some small scale weed/ vegetation clearance by Waihi Vision Trust, for example around the Cyanide Tanks. There are plans currently underway through the Union Hill walkway project including the provision of signage.

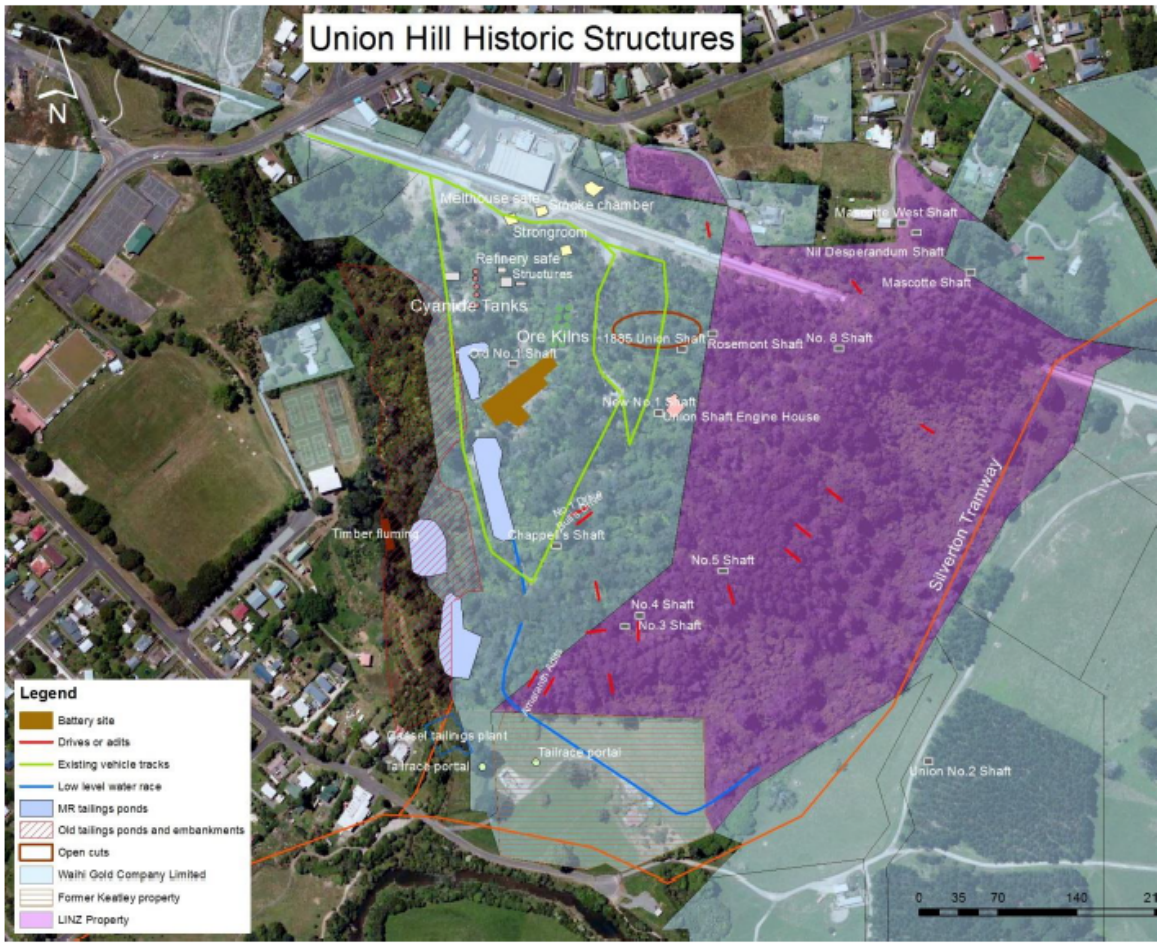

Figure 58. Heritage features identified in the Union Hill Heritage Landscape Management Plan (source: Macready and Clough 2016: Figure 3)

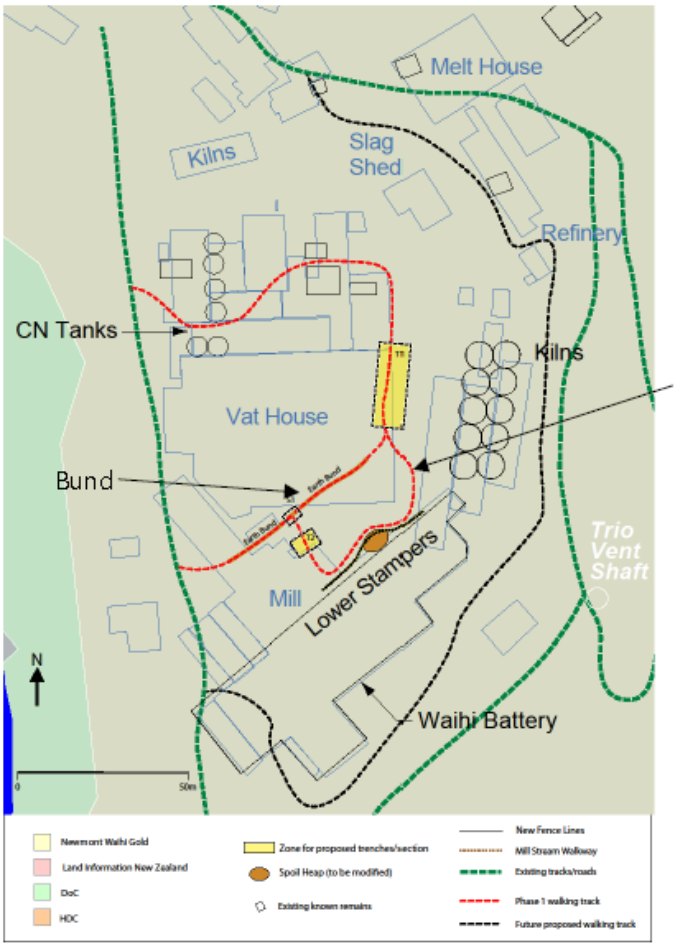

Figure 59. Walkway works that were monitored recently at Union Hill under Authority 2012/542 (Gallagher 2017: 8)

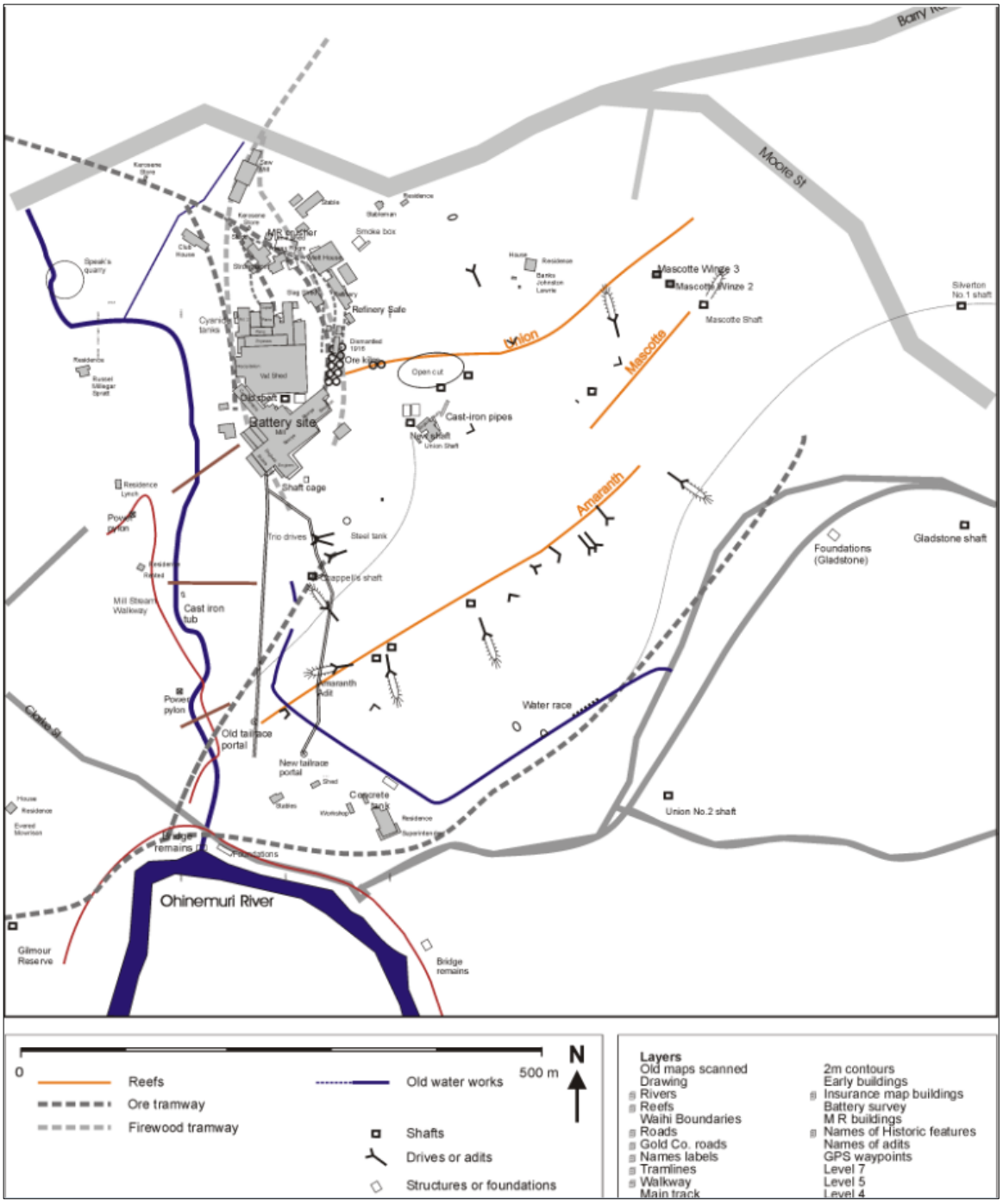

Figure 60. Survey of Union Hill and the western edge of Gladstone Hill mining features (source: OGNZL unknown date)

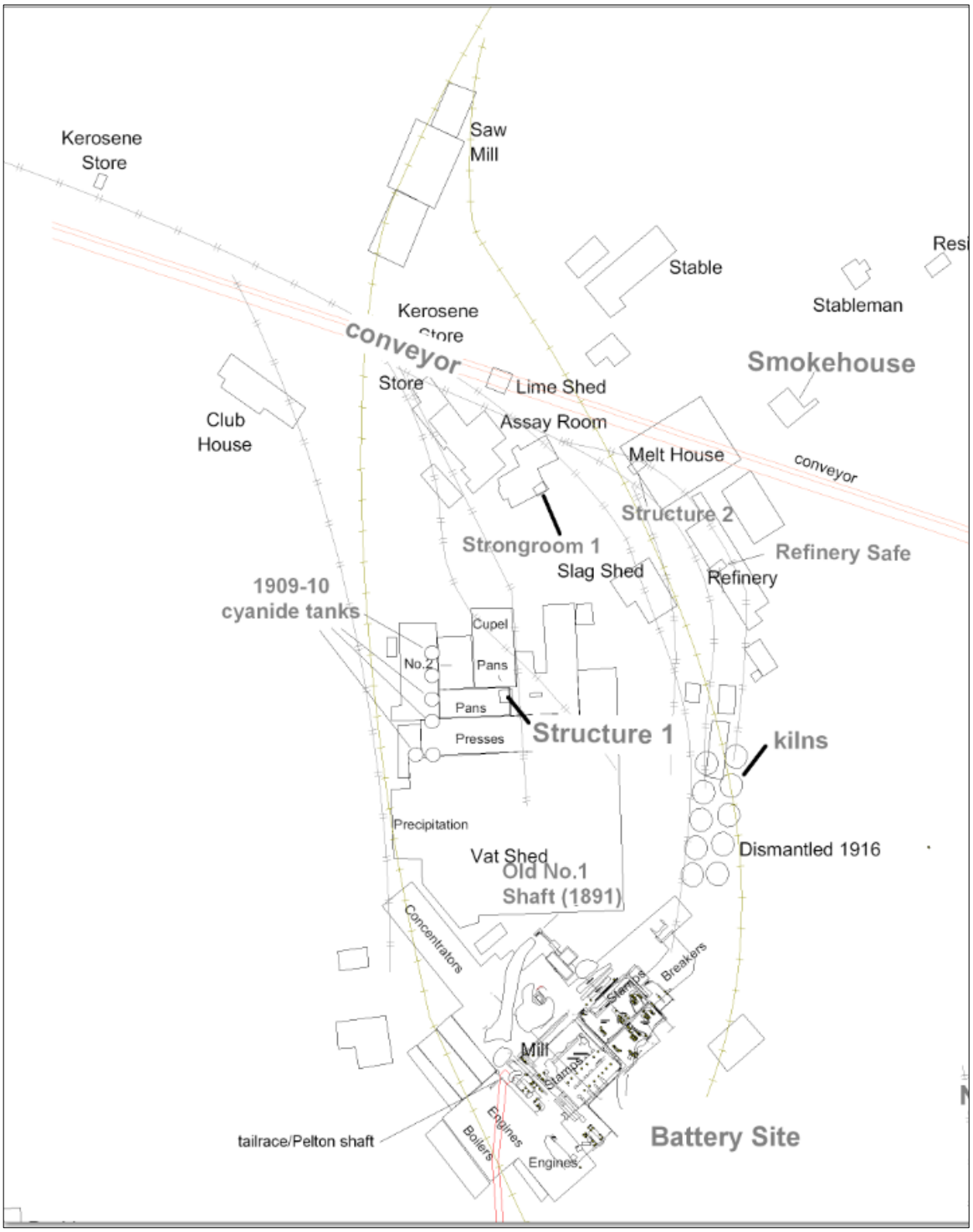

Figure 61. Example of survey plan showing Union Hill features (source: OGNZL unknown date)

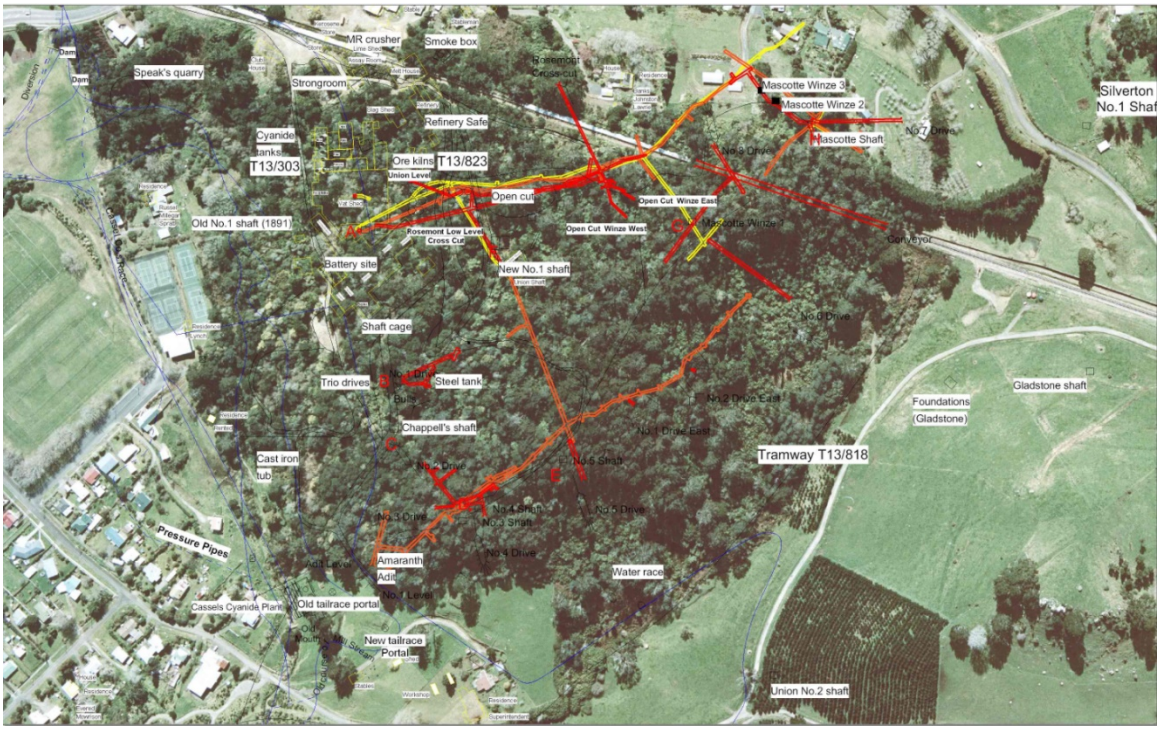

Figure 62. Plan of Union Hill underground drives and shafts overlaid on 1996 aerial (source: OGNZL unknown date)

Favona Hill

Compared to other locations there has been limited archaeological survey of the Favona Hill site, which includes the Favona Old and New Shafts. The low-level water race T13/817 (see below) was recorded in section by Dr Caroline Phillips to the east side of Favona Hill (Phillips 2000), and its route planned by Ray Hooker (Hooker 2003).

Silverton Hill, Winner Hill, Gladstone Hill

In 2000 a field survey was undertaken by a small team led by Dr Caroline Phillips in advance of drilling expansion by the Gold Mine (Phillips 2000). This survey covered the majority of Gladstone Hill, Winner Hill, Silverton Hill and Union Hill (ibid.). The survey did not identify any archaeological features of Maori origin at these locations, but concluded there was potential for such features to survive on unmodified areas on the high points of Union Hill, Winner Hill, and Gladstone Hill (Figure 63).

At Silverton Hill numerous features relating to early mining activities were recorded, including the foundations of a magazine and terraces thought to be related to the Silverton Battery (NZAA T13/819). At Winner Hill a series of shafts, tailings and other features were recorded (NZAA T13/820). The same survey recorded a drive, shafts, concrete features and waste disposal areas on Gladstone Hill (NZAA T13/821). Sites relating to early mining activities were recorded (Figure 64), as well as more recent mining activities (Figure 65).

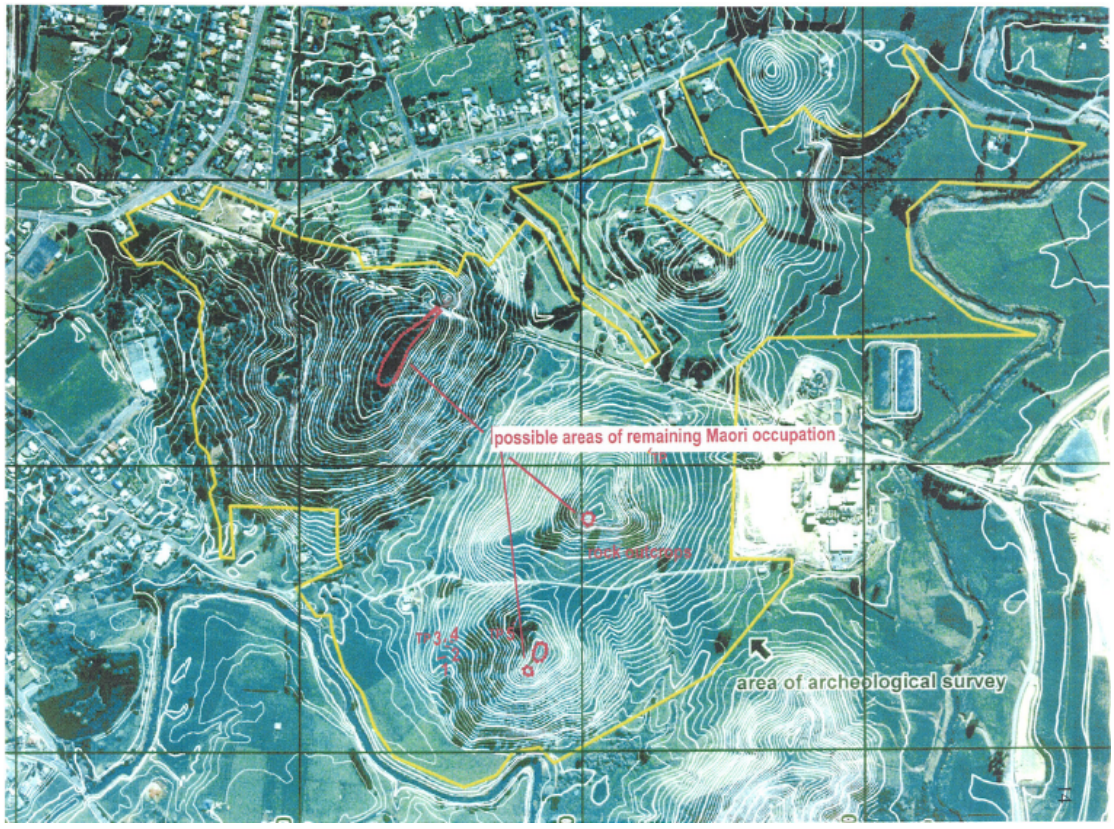

Figure 63. Areas of possible survival of Maori occupation evidence identified by Phillips in 2010 (After Phillips 2000: Figure 2)

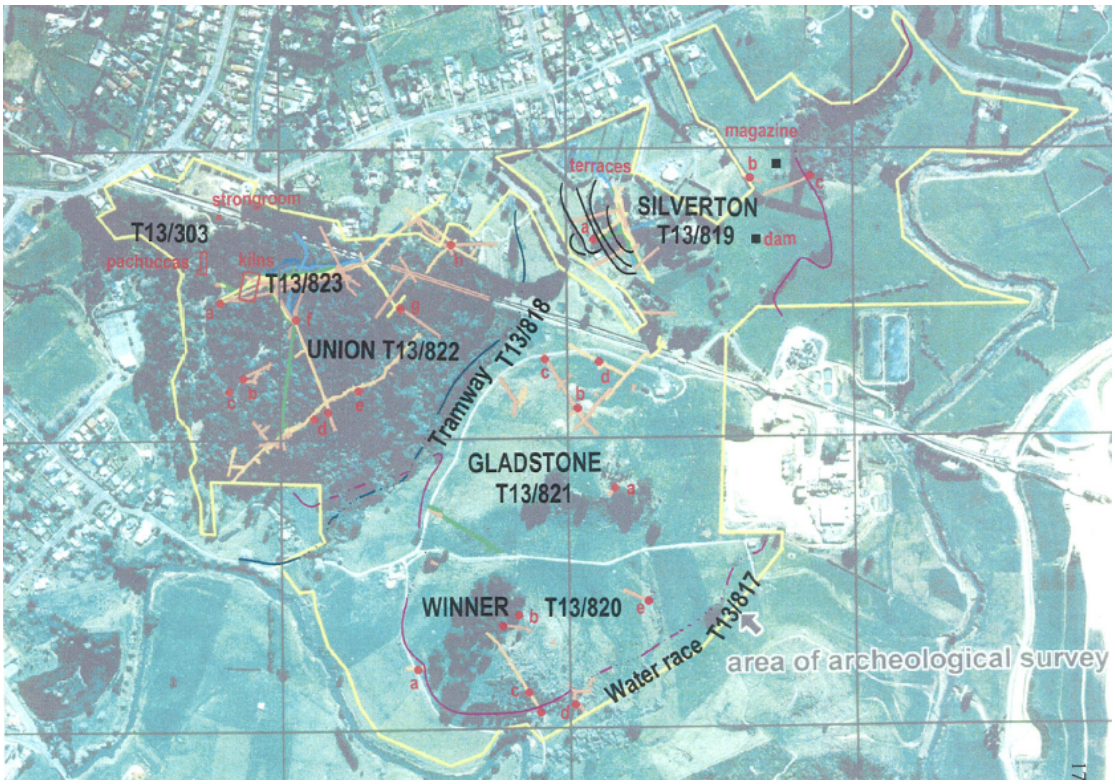

Figure 64. Archaeological features and sites recorded in Phillips 2000 Survey (source: Phillips 2000: Figure 3)

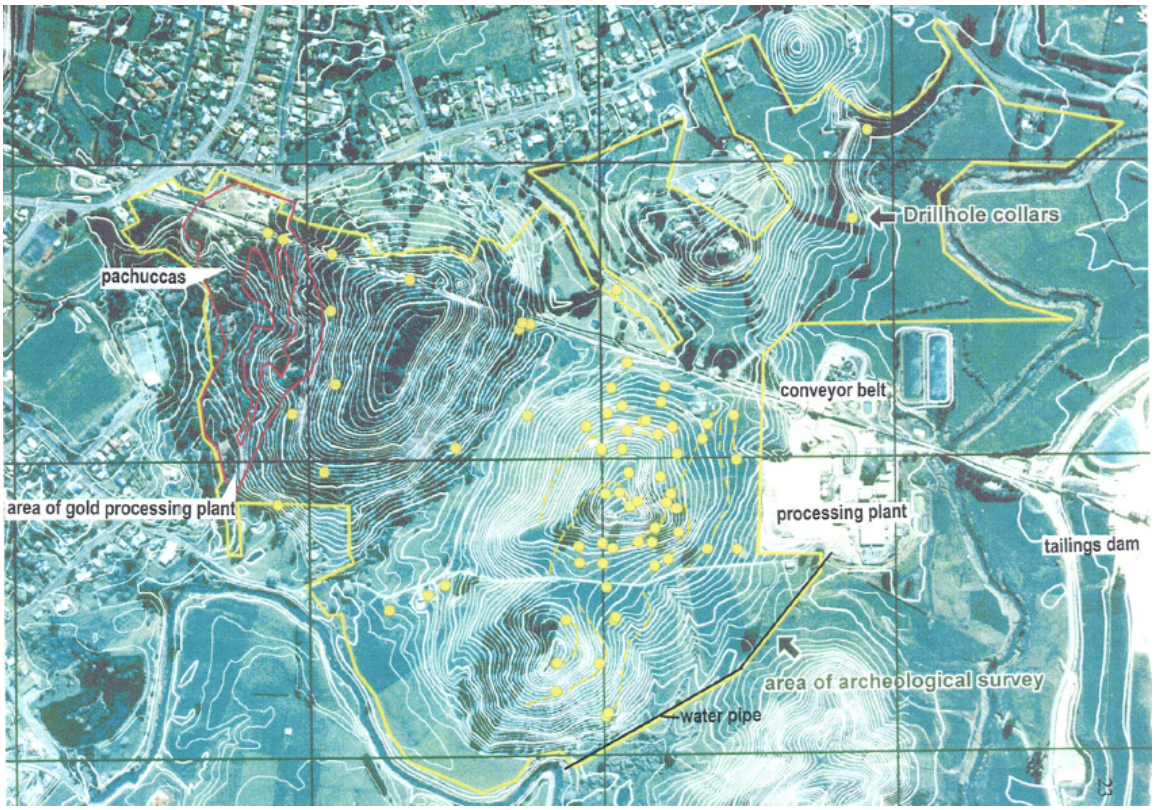

Figure 65. Sites relating to modern mining activities recorded by Phillips in 2000 (source: Phillips 2000: Figure 4)

Motukeho / Black Hill

Motukeho (Black Hill) was identified by Owen Wilkes in 1999 as a pa site, on the basis of traditional Maori knowledge recorded by Fin Phillips (Phillips 1995).

Ohinemuri-Waihi Low Level Water Race

The low-level water race was recorded as an archaeological site T13/817 by Dr Caroline Phillips as part of the 2000 survey of the Mine extension area (Phillips 2000). The course of the water race was surveyed in more detail and planned by Ray Hooker and Waihi Gold Mine Co. surveyors in 2003, ahead of a proposal to store waste rock in a location along part of the route (Hooker 2003). The recorded route of the water race is shown in Figure 66.

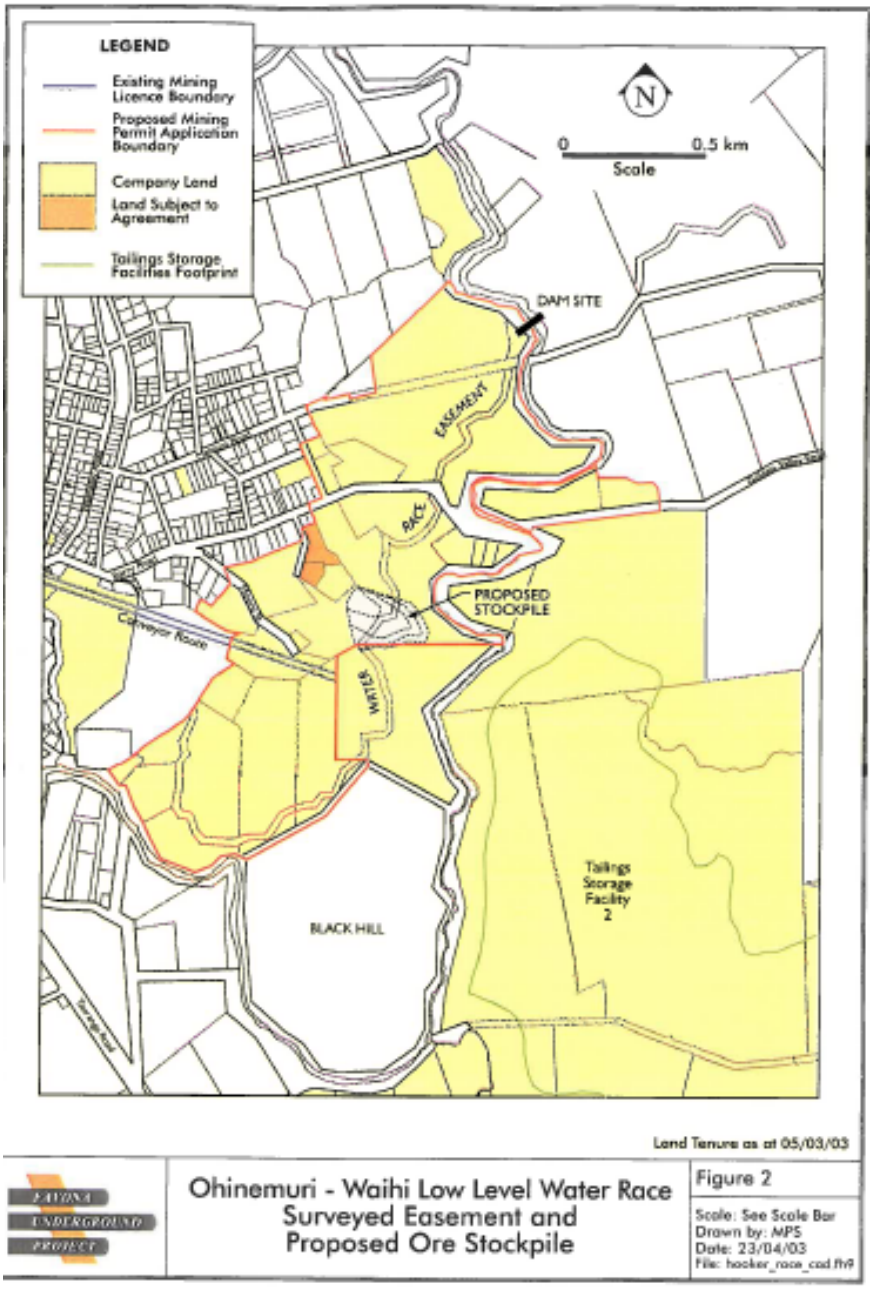

Figure 66. Recorded line of the Ohinemuri - Waihi low level water race shown as 'water race easement' (source: Hooker 2003: Figure 2)

East Waihi Waste Disposal Site (Baxter Road)

A field survey was undertaken in this area by Jill Pierce in 1984 (Pierce J, 1984). Pierce identified a number of individual features, grouped into 11 sites. Subsequent investigations by New Zealand Historic Places Trust (now Heritage New Zealand) in1986 determined that the majority of these features were not archaeological in origin and were areas of natural slumping (McFadgen 1987, referenced in Barr C, 1997). This latter conclusion was supported by Cathryn Barr, who surveyed the southern part of the area in 1997 and identified no archaeological sites (Barr, C. 1997). Part of the area was also surveyed by Ray Hooker in 1997, who relocated some of the sites identified by Pierce, which he too considered to be the result of natural processes (Hooker 1997).

PHYSICAL ENVIRONMENT CONTEXT

Waihi is part of a geographically defined district and it is the mineral-bearing geology of the area, containing the productive quartz reefs, which led to the discovery of the presence of gold by European settlers in 1878. This led to the huge enterprise of gold mining that gave birth to Waihi town and has sustained it to this day. The following geological information is summarised from Braithwaite and Christie 1996; McAra 1988; geological maps prepared by GNL and OGNZL; and, lecture notes given by A.H.V. Morgan (deceased), included in the Waihi Borough Council Diamond Jubilee Booklet 1902-1962.

Geology

The Waihi area is part of the Coromandel Volcanic Zone, a Miocene to Early Pleistocene andesite-dacite-rhyolite volcanic sequence which forms the Coromandel-Kaimai ranges. The surface geology of the Waihi area is relatively complex, with a distinct SW to NE division caused by the Waihi fault, which runs to the west of the town (Figure 67).

The earliest andesite formations date to approximately 12 million years BP. It is these formations (mainly within the Waiwawa Subgroup), which host the quartz veins (or reefs) that are the reason for the mining activity in this area. Around Waihi the subgroup is represented by andesite and dacite lava flows and tuff breccias of the Waipupu Formation Subgroup (Figure 68).

Overlying this reef-bearing quartz andesite and separated from it by an old land surface, is a younger series of andesites into which the veins do not extend. The wooded hills to the north and west of Waihi consist of these younger andesites (Omahine subgroup). Overlying this hard black younger andesite is a grey coloured rhyolite, which forms the hills east of Waihi and extends southwards to Mt Hikurangi (Coroglen Subgroup). The greater part of the Waihi Plains is covered by another rhyolite, grey to purple in colour and containing fragments of andesite and other rocks (Minden Rhyolite).

Between the upstanding volcanic hills, sedimentary deposits of quaternary age overlie the most recent rhyolite formations (Onihemuri Subgroup) and are characterised by swampy low-lying ground. Sedimentary rocks are almost entirely absent within the Waihi area. In addition to the above there occur several outcrops of volcanic rocks of Late Miocene or early Pliocene age, the most conspicuous of which is Black Hill, which consists of a hornblende andesite (Kaimai Subgroup).

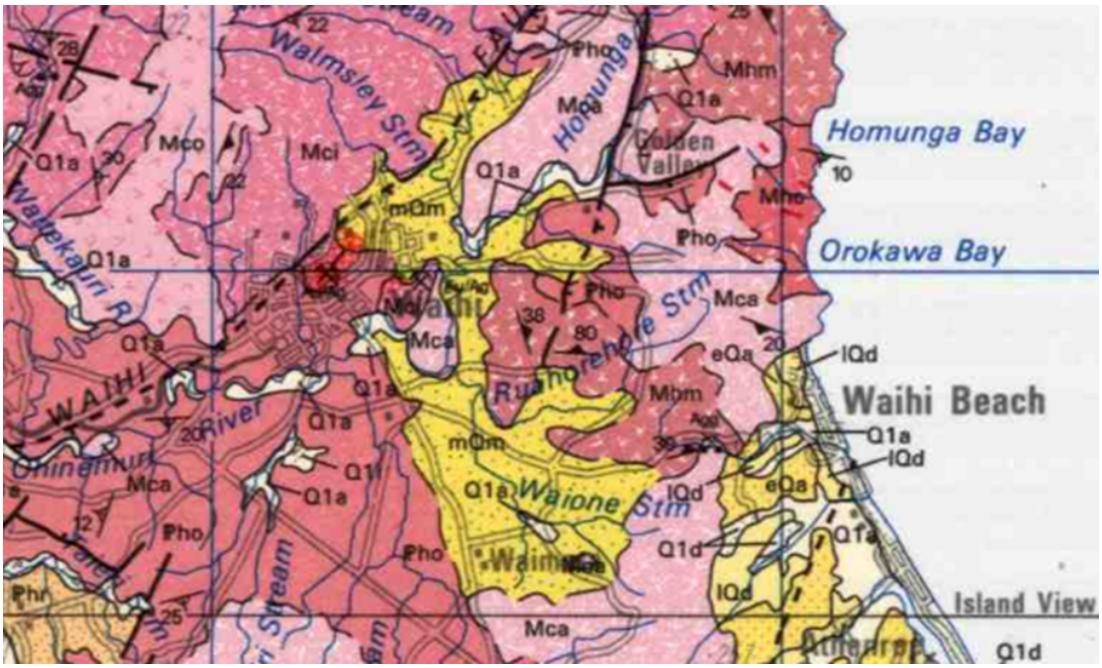

Figure 67. Geology of the Waihi area (source: Edbrooke 2001)

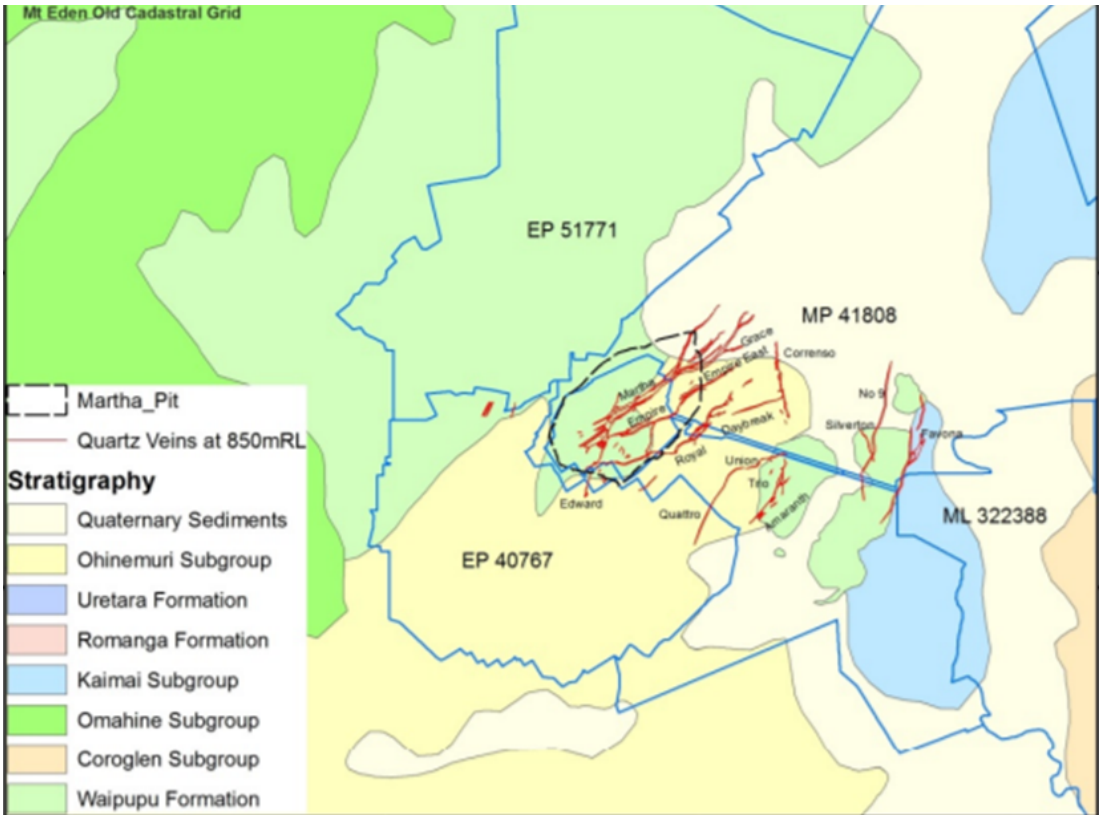

Figure 68. Detail of geological deposits around Waihi (source: OGNZL unknown date)

Reefs of the Waihi goldfields

Only the Martha Hill and Union-Silverton systems proved to contain gold and silver in economic quantities (McAra 1988: 22). The principal reefs of the Waihi goldfields fall into two main groups: the Martha Hill system which contained the Waihi and Grand Junction mines, and the Union -Silverton Hills system which contained the Union and Silverton mines (ibid).

Only a small area of the quartz andesites are exposed on the surface, nevertheless the general positions of the underground reefs located by 1914 are shown in Figure 69. The whole structure formed a network if veins, with the richest concentration near No. 1 Shaft. All mining on the Union- Silverton Hills system had ceased by 1902, making the Martha Hill system by far the most important. As already outline (above, Historical Background) the Martha system was divided into three main parts, with Grand Junction holding the western and eastern end reefs and Waihi Gold Mining Company the middle portion reefs.

The Waihi Hill system reefs (moving north-west to south-east) were: North, Number Two, Martha North Leader, Martha, South Branch Martha, Welcome, Welcome Right Branch , Surprise, Bell Crosscut, Magazine, Victoria, Albert, Alexandra, Jellicoe, 208 Foot, Prince, Empire, the letter reefs (B,C,H,I,J,K and L), Princess, Dreadnought, Edward, Royal North Branch, Royal, Rex, Ulster. Other reefs include the Reptile and Scorpion crosscuts. The most important reefs in the Waihi Mine were Martha, Welcome, Empire, Royal and Edward.

Only a relatively small amount of ore in the Waihi Mine was accessible from surface adits or horizontal tunnels so shaft-sinking was a fundamental aspect of mining and involved highly developed equipment for pumping, winding and construction (ibid:173). The historical gold mining process, ore treatment and gold recovery methods are well documented in McAra 1988.

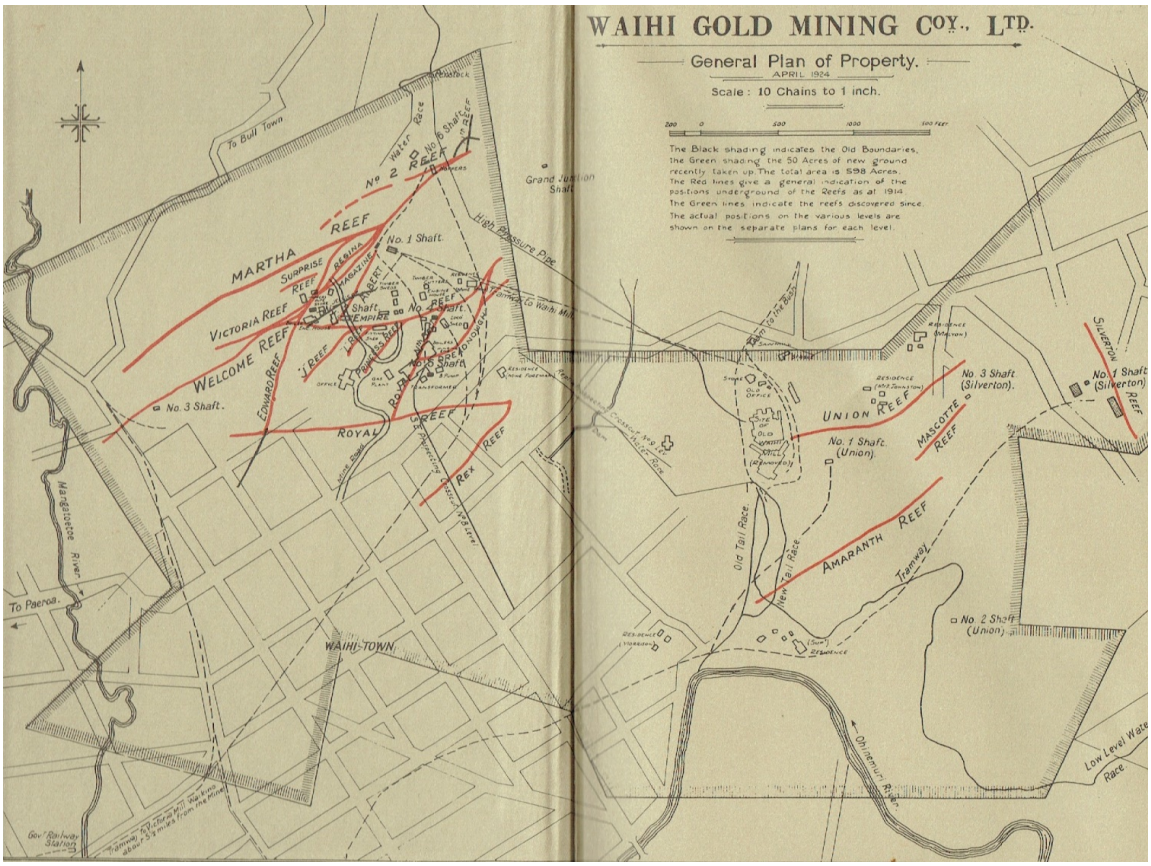

Figure 69. Waihi Gold mining Coy Ltd General Plan of Property April 1924. The red lines give the general indication of the positions of underground reefs as located by 1914 and their names (McAra 1988)

Topography and Land Use

The topography of the general area is characterised by several hills of volcanic origin, which contain many of the Quartz veins sought after by the mining concerns, past and present. Northwest of Waihi Town the Martha Hill is the most westerly, now heavily modified by open-cast mining activity undertaken since the last quarter of the 20th century (Figure 70).

East of the town is Union Hill, which is still largely covered with indigenous forest species (Figure 71), but also contains a high number of pine trees and other exotic species. A smaller stand of indigenous trees survives also on Rosemont Hill nearby to the northeast. Winner, Gladstone, Silverton and Favona Hill describe a slight north-south 'crescent' of higher ground east of Union Hill, with Gladstone, Silverton and Favona all modified by mining activity or modern settlement. Winner Hill is also modified to a degree, but retains grassland and exotic forest along the southwest slopes. Motukeho / Black Hill to the southeast of Winner Hill includes the Ngatikoi Domain, and retains a small stand of indigenous forest on the summit with broadleaf indigenous hardwoods to the south and west slopes. The Ohinemuri River creates a 'U' around the southern half of the hill, and bisects the area with the upstream stretch meandering northwards between the Gladstone mining site and the eastern tailing storage ponds. On a higher east-west ridge north of the tailing ponds large stand of indigenous forest survives, with pockets of exotic forest north of this.

The lower ground between these features, which form the foothills of the Coromandel Range (Figure 71), is largely rural in character, and mainly consists of pasture and grassland, divided up by rural roads and tracks, field boundaries, and watercourses, several of which are branches of the Ohinemuri River.

Urban areas are predominantly concentrated around the Martha Pit itself, with the main built areas to the south and west, and about one-third of the urban area to the northeast. In effect this creates an irregular ring, partly constrained by the Coromandel ranges to the west, and the path of the Ohinemuri River to the south (Figure 72). The town of Waihi has a wide main street (Seddon Street), with various historical buildings concentrated in this area, including the old Rob Roy Hotel. The relocated Cornish Pumphouse is on the eastern side of Martha Hill. Together with the replica poppet head these are local landmarks at the northern end of Waihi Township.