

IN THE MATTER OF

the Resource Management Act 1991

AND

IN THE MATTER OF

applications for resource consents and notices of requirement in relation to the Ōtaki to North of Levin Project

BY

WAKA KOTAHI NZ TRANSPORT AGENCY

Applicant

ŌTAKI TO NORTH OF LEVIN PROJECT: TECHNICAL ASSESSMENT L
ARCHAEOLOGY

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EXECUTIVE SUMMARY

1. The Ōtaki to north of Levin highway Project ("**Ō2NL Project**" or "**Project**") involves the construction, operation, use, maintenance and improvement of approximately 24 kilometres of new four-lane median divided state highway (two lanes in each direction) and a shared use path ("**SUP**") between Taylors Road, Ōtaki (and the Peka Peka to Ōtaki expressway ("**PP2Ō**") and State Highway 1 ("**SH1**") north of Levin.
2. This technical report assesses the actual and potential environmental effects of the Ō2NL Project on archaeological values. It has been prepared to support the notices of requirement ("**NoRs**") for designations and application for resource consents for the Ō2NL Project. This report addresses all aspects of the Resource Management Act 1991 ("**RMA**") definition of historic heritage that may also be defined as archaeological sites under section 6 of the Heritage New Zealand Pouhere Taonga Act 2014 ("**HNZPTA**").
3. The RMA and HNZPTA promote the identification, protection, preservation and conservation of historical and cultural heritage, with the HNZPTA also providing a legislative mechanism, via an authority process, for the management of the modification or destruction of archaeological sites.
4. My report follows the methods and approaches set out in the Heritage New Zealand Pouhere Taonga ("**HNZPT**") and Waka Kotahi New Zealand Transport Agency ("**Waka Kotahi**") guides for the assessment of archaeological sites. Aspects of my research have been coordinated with the Project Iwi Partners, with information and research advice provided when requested. I have discussed the Ō2NL Project with HNZPT.
5. As a result of my input on the development of the Project, key decisions to avoid or minimise adverse effects on archaeological sites were made by Waka Kotahi during the consideration of corridor/route options for the Ō2NL Project, including the MCA process. Specifically, the decision to pursue an eastern corridor for the new highway avoids a coastal landscape containing numerous pā and kāinga, hunting and cultivation grounds, colonial homesteads, battle sites, urupā and midden, amongst other sites. In doing so, the Ō2NL Project has protected the cultural and historic heritage landscape(s) from what would likely be significant adverse effects to numerous archaeological sites (Parker, 2017: 17-25, MCA assessment of archaeological risks for route options).

6. There are no listed historic places or areas on the New Zealand Heritage List/Rārangī Kōrero or New Zealand Archaeological Association ("**NZAA**") recorded archaeological sites within the proposed designations. There are no scheduled historic heritage or mana whenua/wāhi tapu sites in the Greater Wellington Regional Council ("**GWRC**") Proposed Natural Resources Plan ("**PNRP**"), Manawatū-Whanganui Regional Council ("**Horizons**") One Plan ("**One Plan**"), or the Horowhenua District Council ("**HDC**") District Plan ("**HDP**") within the proposed designations.
7. There is one potentially relevant scheduled heritage site in the Kāpiti Coast District Council ("**KCDC**") District Plan ("**KCDP**"). This site is listed as 'B70' and is a historical site located east of SH1 at the summit of Pukehou Hill. This site is outside the proposed designation and will not be affected by the Ō2NL Project. However, a heritage trail sign commemorating the site is shown in the KCDP as being within the proposed designation.
8. I have identified 13 archaeological sites that will be adversely affected by the Ō2NL Project. Twelve of these sites are local roads built during the 19th century that are of low archaeological value. The 13th is the remains of a sawmillers' tramway of medium value (refer to **Figure L.3** at paragraph 75 of this report). There are 46 potential archaeological sites of mostly low or medium value within the proposed designations. Archaeological remains are generally not expected to be found at these sites, but the possibility cannot be entirely ruled out.
9. If there are any archaeological discoveries within the construction footprint there will be limited ability to avoid affecting the relevant area. The potential adverse effects of the Ō2NL Project on archaeological sites are managed through separate applications to HNZPT for archaeological authorities, and in response to the risk of discovering unknown archaeological remains, it is recommended conditions include an archaeological discovery protocol. After the new highway has been completed, any archaeological discovery protocol and information relating to archaeology will need to be updated in respect of maintenance or upgrade works outside of the construction footprint which could affect archaeological sites.

10. Overall, the Ō2NL Project will have only negligible effects on the known archaeological landscape with the potential for mostly negligible or minor effects on unknown archaeological sites. The proposed designations:
 - (a) protect the wider archaeological landscape and avoid significant adverse effects to the dense archaeological landscapes of the Horowhenua and Kāpiti coastal dune system;
 - (b) ensure that the potential remaining effects can be appropriately managed through the use of archaeological discovery protocols and the HNZPT archaeological authority process; and
 - (c) mitigate adverse effects through positive opportunities to incorporate archaeological and cultural information in the Ō2NL Project's design framework.

INTRODUCTION

11. My name is Daniel John Parker.
12. I am an archaeologist and director of inSite Archaeology Limited.
13. This technical report addresses matters of historic heritage relating to the actual and potential environmental effects of the Ō2NL Project on archaeology.

QUALIFICATIONS AND EXPERIENCE

14. I have the following qualifications and experience relevant to this assessment:
 - (a) I have a Bachelor of Arts (Hons) degree in anthropology, specialising in the sub-discipline of archaeology, with a minor in history;
 - (b) I also have a Master of Arts degree in anthropology, specialising in the sub-discipline of archaeology;
 - (c) I am a member of the NZAA and the International Association of Landscape Archaeology;
 - (d) Since graduating from the University of Auckland in 2012 I have worked at inSite Archaeology Limited, predominantly in the Horowhenua and Manawatū regions. I have also worked as a tutor and archaeological surveyor for the University of Auckland between 2003 and 2008. My clients include central government agencies, local and regional councils, iwi authorities and private developers amongst others. Some

recent or current projects where I have provided archaeological advice, include:

- (i) Palmerston North Regional Freight Hub, for KiwiRail Holdings Limited;
- (i) Palmerston North City Council wastewater treatment best possible option analysis, Palmerston North City Council;
- (ii) Lower Manawatu Rural (stopbank) Upgrade, Horizons Regional Council;
- (iii) Foxton Beach and Waitarere Beach master planning for future growth, Horowhenua District Council; and
- (iv) Mangahewa C wellsite extension, Todd Energy.

CODE OF CONDUCT

15. I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2014. This assessment has been prepared in compliance with that Code, as if it were evidence being given in Environment Court proceedings. In particular, unless I state otherwise, this assessment is within my area of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

PURPOSE AND SCOPE OF TECHNICAL REPORT

16. Waka Kotahi is giving NoRs for designations to HDC and KCDC and is applying for the necessary resource consents from Horizons and the GWRC for the Ō2NL Project. The Ō2NL Project is part of the New Zealand Upgrade Programme ("**NZUP**") and has the purpose to *"improve safety and access, support economic growth, provide greater route resilience, and better access to walking and cycling facilities"*.
17. The new State Highway route was selected following a staged multi-criteria analysis ("**MCA**") of route, interchange and local road options. The process involved a consideration of the investment and Project objectives, environmental, archaeological, built heritage and social impacts amongst other factors.
18. This report is one of a suite of technical reports prepared for the Ō2NL Project and assesses the actual and potential environmental effects of the Ō2NL Project on archaeological sites. It has been prepared to support the NoRs and application for resource consents for the Ō2NL Project and

addresses aspects of the RMA definition of historic heritage that may also be defined as archaeological sites under section 6 of the HNZPTA.

19. The RMA definition of historic heritage:

(a) *means those natural and physical resources that contribute to an understanding and appreciation of New Zealand's history and cultures, deriving from any of the following qualities:*

(i) *archaeological;*

(ii) *architectural; and*

(iii) *cultural; and*

(iv) *historic; and*

(v) *scientific; and*

(vi) *technological; and*

(b) *includes –*

(i) *historic sites, structures, places, and area; and*

(ii) *archaeological sites; and*

(iii) *sites of significance to Māori, including wāhi tapu; and*

(iv) *surroundings associated with the natural and physical resources.*

20. Section 6 of the HNZPTA defines an archaeological site as:

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

(i) *Was associated with human activity that occurred before 1900 or is the site of the wreck of any vessel where the wreck occurred before 1900; and*

(ii) *Provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand; and*

(b) *Includes a site for which a declaration is made under section 43(1).*

21. The HNZPTA definition of an archaeological site encompasses all of the sites / places / areas identified in (b) of the definition of historic heritage, where these are associated with pre-1900 activity that can be investigated by archaeological methods. The RMA does not incorporate a time period (or cut-off date) within its definition of historic heritage.

22. While I have undertaken the underlying analysis and the writing of this report, this work has not been completed in isolation. A number of parties have contributed to debate or discussion of issues that are relevant to archaeological sites and the Ō2NL Project. In particular:
- (a) A meeting on the 11th of June 2020, was attended by representatives for Waka Kotahi (L. Jarrett, R. Napier, A. Neill), Stantec (S. Blackmore, Raewyn Pudsey), HNZPT (G. Baumann, A. Dangerfield, K. Hurren, V. Tanner) and myself. The meeting was to discuss the approval process for appointing a qualified archaeologist and to inform HNZPT of the short-listed options and details of the archaeological assessment of effects feeding into the MCA process and engagement with iwi. Reflecting on recent experience regarding the management of archaeological matters with the Mackays to Peka Peka ("M2PP") and PP2Ō projects, HNZPT recommended that the Ō2NL Project seek to manage archaeological effects through two archaeological authorities:
 - (i) the first being an authority with a detailed research strategy and management plan for all archaeological sites that are to be excavated or otherwise managed before construction is started; and
 - (ii) a second authority with a more flexible management plan for unknown archaeological sites that may be found during construction.
 - (b) Based on historic sources and aerial photographs, I produced an initial list of houses or buildings of verified or potential archaeological value. This initial list was provided to the built heritage technical expert, Ian Bowman. Where post-1900 houses or buildings were able to be positively identified, these places were removed from the list of potential archaeological sites.
 - (c) Copies of archaeological maps and reports prepared for the Ō2NL Project have been provided to the Project Iwi Partners for discussion and review. Additional research and map information has also been provided to Project Iwi Partners, on request, to support the preparation of cultural impact assessments.

Assumptions and exclusions in this assessment

23. As previously noted, my assessment addresses historic heritage relating to archaeology, which includes pre-1900 built heritage that will, or may be,

directly affected by the Ō2NL Project. However, my assessment of these places is focused on the potential for subsurface archaeological remains associated with the occupation of the building(s) to be affected and not the architectural qualities of building(s). This aspect of built heritage is addressed in Ian Bowman's Technical Assessment M (Built Heritage).

24. My assessment references a number of archaeological sites that are also places of significance or interest to other technical experts, particularly to places of cultural value recognised by the Muaūpoko and Ngāti Raukawa Kite Tonga (Cultural Impact Assessment, Volume V). Where there is overlap in terms of common areas or places of interest, my assessment is limited to aspects of archaeological enquiry. Questions of wāhi tapu, wahi taonga and aspects of Te Ao Māori are excluded from this report. It is noted that the absence of archaeological sites does not preclude the potential for places to be of value to Māori.
25. The sources that have been reviewed strongly indicate there is a low probability that additional 19th century house or building sites will be found, and I am confident that this aspect of the archaeological landscape is accurately presented in this report. However, one further avenue of enquiry that I was unable to review in full are the late 19th century rates and valuation roll books for the Horowhenua and Kāpiti districts. There is some potential that further information identifying the presence of late 19th century buildings and houses is contained in these archival records (however, I consider this unlikely).

PROJECT DESCRIPTION

26. The Ō2NL Project involves the construction, operation, use, maintenance and improvement of approximately 24 kilometres of new four-lane median divided state highway (two lanes in each direction) and a SUP between Taylors Road, Ōtaki (and the PP2Ō expressway) and SH1 north of Levin. The Ō2NL Project includes the following key features:
 - (a) a grade separated diamond interchange at Tararua Road, providing access into Levin;
 - (b) two dual lane roundabouts located where Ō2NL crosses SH57 and where it connects with the current SH1 at Heatherlea East Road, north of Levin;

- (c) four lane bridges over the Waiaute, Waikawa and Kuku Streams, the Ōhau River and the North Island Main Trunk ("NIMT") rail line north of Levin;
- (d) a half interchange with southbound ramps near Taylors Road and the new Peka Peka to Ōtaki expressway to provide access from the current SH1 for traffic heading south from Manakau or heading north from Wellington, as well as providing an alternate access to Ōtaki.
- (e) local road underpasses at South Manakau Road and Sorenson Road to retain local connections;
- (f) local road overpasses to provide continued local road connectivity at Honi Taipua Road, North Manakau Road, Kuku East Road, Muhunoa East Road, Tararua Road (as part of the interchange), and Queen Street East;
- (g) new local roads at Kuku East Road and Manakau Heights Road to provide access to properties located to the east of the Ō2NL Project;
- (h) local road reconnections connecting:
 - (i) McLeavey Road to Arapaepae South Road on the west side of the Ō2NL Project;
 - (ii) Arapaepae South Road, Kimberley Road and Tararua Road on the east side of the Ō2NL Project;
 - (iii) Waihou Road to McDonald Road to Arapaepae Road/SH57;
 - (iv) Koputaroa Road to Heatherlea East Road and providing access to the new northern roundabout;
- (i) the relocation of, and improvement of, the Tararua Road and current SH1 intersection, including the introduction of traffic signals and a crossing of the NIMT;
- (j) road lighting at conflict points, that is, where traffic can enter or exit the highway;
- (k) median and edge barriers that are typically wire rope safety barriers with alternative barrier types used in some locations, such as bridges that require rigid barriers or for the reduction of road traffic noise;
- (l) stormwater treatment wetlands and ponds, stormwater swales, drains and sediment traps;

- (m) culverts to reconnect streams crossed by the Ō2NL Project and stream diversions to recreate and reconnect streams;
- (n) a separated (typically) three-metre-wide SUP, for walking and cycling along the entire length of the new highway (but deviating away from being alongside the Ō2NL Project around Pukehou (near Ōtaki)) that will link into shared path facilities that are part of the PP2Ō expressway (and further afield to the Mackays to Peka expressway SUP);
- (o) spoil sites at various locations along the length of the Project; and
- (p) five sites for the supply of bulk fill /earth material located near Waikawa Stream, the Ōhau River and south of Heatherlea East Road.

METHODOLOGY

Introduction

27. The methodology applied in this report is divided into three stages:
- (a) data definition;
 - (b) data collection; and
 - (c) values / effects scoping.

Data definition

28. Archaeological sites are a subset within the broader scope of historic heritage, as defined in the RMA. This assessment is focused on the identification and evaluation of archaeological sites. The definition of what constitutes an archaeological site that is used here is sufficiently broad, meaning it includes some cross-over into a number of other elements of heritage that are addressed by other technical experts. Where there is cross-over, it is important to remember that the approach taken to the assessment of these sites or issues is from an explicitly archaeological perspective and it does not speak for the values and interests that may be relevant to other assessments.
29. Within the scope of archaeological sites, this report may refer to:
- (a) listed or scheduled historic heritage places and areas;
 - (b) recorded archaeological sites;
 - (c) known archaeological sites; and
 - (d) potential or unknown archaeological sites.

30. Listed or scheduled historic heritage places and areas, that are predominantly historic buildings, structures or monuments but also includes some archaeological sites, are "*significant and valued historical and cultural heritage places*" recognised and listed by HNZPT on the New Zealand Heritage List/Rārangī Kōrero, or scheduled by councils in district or regional plans. The NZAA maintains an online database of archaeological sites that includes basic site details and location information. While the NZAA database contains a substantial number of sites, it is not a complete record and there are many sites that are not included in the database. For this reason, sites listed in the NZAA database are referred to as 'recorded' sites, while sites not included in the database, but identified through other sources, are referred to as 'known' sites. Where there is no direct evidence for archaeological sites, but their presence is strongly inferred (on the basis of patterns in the distribution of known and recorded sites, or other sources of information) reference may be made to 'potential' or 'unknown' sites.
31. Of particular note is the possibility for unknown sites to be affected by the Ō2NL Project. Effects on unknown sites encountered during construction works are likely to be more adverse than effects on sites that are identified prior to construction and for which appropriate planning and mitigation is prepared. In considering the analysis and planning required for possible unknown sites, this report interprets the HNZPTA's section 6(a)(i) requirement that a site must be "associated with human activity" as including '*any place with a historic Māori name-association and any unnamed features of the natural environment that are generally regarded as having been focal points for past human activity*'.
32. This enables many rivers, streams, lakes, swamps, hills and dunes etc, to be included in the analysis. Although these features of the natural landscape may not meet the strictest HNZPTA definition of what is an archaeological site, they are part of the historic landscape that is recognised in the RMA. There are a wide range of sources (such as, Māori Land Court Minute Books, nineteenth century ethnographies and oral traditions) that indicate these places have, or could have, an archaeological component that is unrecognised due to issues of surface visibility or a limited history of landscape study. In some cases, the place name associated with a

landscape feature indicates that there is likely to be an archaeological site somewhere within the immediate or general vicinity of the named location.¹

Data collection

33. This assessment is primarily a desktop survey, though some fieldwork has been undertaken. Data collection / research that has been completed covers:
- (a) historic survey plans;
 - (b) historic and recent aerial photographs;
 - (c) LiDAR derived topography;
 - (d) close reading of selected historic newspapers, published books and pamphlets;
 - (e) records of the Māori Land Court;
 - (f) engagement with the Project Iwi Partners;
 - (g) geophysical survey;
 - (h) spatial data from KCDC and GWRC; and
 - (i) observation of selected geotechnical test pits.
34. Historic survey plans were georeferenced into the national coordinate system (NZTM) and the relevant data such as historic settlements, named places, and buildings were digitised. Where suitable, cadastral or topographic data from the Land Information Data Service was used to improve the accuracy of the captured data, particularly in regard to the historic cadastral parcel network that was also digitised.
35. Aerial photographs were processed into a georeferenced orthophotograph and relevant features digitised. The primary benefit of the aerial photography was the identification of known or potential historic buildings that were standing in 1942 that were no longer present in the most recent aerial photos. In terms of data quality, there is greater certainty about the relevant age of data captured from the historic plans than for the historic aerial photography, but there is a higher degree of spatial accuracy and precision for the aerial photography than there is for the historic plans.

¹ For example, place names including the Māori noun for oven, *umu*, indicating cooking activity in the area: that is, *umu-kiwi*, the kiwi oven(s); or *umu-kuri*, the native dog oven(s).

36. No archaeological sites were identified directly from LiDAR derived topography. Rather, LiDAR data was used to assess changes in the landscape that may have affected the survival of archaeological sites and to identify areas to be targeted for geophysical survey or landforms where unknown sites are more likely to be found.
37. Spatial information relating to heritage sites listed by KCDC and GWRC was also acquired. There are no scheduled HDC or Horizons heritage sites within the proposed designations. HNZPT's New Zealand Heritage List/Rārangī Kōrero was also searched, but there are no listed historic places or areas within the proposed designations. Further, there are no NZAA recorded archaeological sites within the proposed designations.
38. Selected readings from Māori Land Court minute books for cases pertaining to the Horowhenua, Horowhenua 3, Manawatu-Kukutauaki 4 and 7D, Muhunua, Ōhau, Paruauku and Pukehou blocks were undertaken. Possible archaeological sites were mapped as accurately as the text and available spatial data allowed. The same strategy was applied to the study of published books and pamphlets regarding local histories, schools and events such as church centenaries. Personal and place names identified from historic maps and written sources were also used as keywords to search the National Library's database of digitised historic papers with articles, briefs and advertisements regarding subjects such as Manakau, Kuku, Ōhau, Muhunua, Arapaepae and Heatherlea, amongst others, being reviewed.
39. The testimony of late 19th century Māori witnesses contained in the minutes of the Māori Land Court indicated the possible presence of significant archaeological sites (settlements and urupā) at Pukehou and Kimberley (Parker and Bader, 2020). Waka Kotahi commissioned a geophysical survey to investigate this, and the survey was undertaken between 16 and 28 November 2020 and received support and assistance from representatives of the Muaūpoko and Ngāti Raukawa ki te Tonga iwi. No definitive evidence of settlements and urupā was identified during the survey, but other archaeological sites were identified and this has contributed to the assessment of the unknown site potential.
40. Between April and June 2021, the excavation of a number of geotechnical test pits has been observed and soil profiles documented across the length of the proposed designations. No archaeological material has been observed.

41. Advice on matters relating to archaeological sites has been sought from iwi at hui and throughout the MCA process. Research advice and information to support iwi has also been provided when it has been requested.
42. Summary tables of data for all archaeological sites and potential archaeological sites located inside the Ō2NL Project's proposed designations are provided as **Appendix L.1** to this report. Each site record includes:
 - (a) A site number that is referenced in the labels for all sites shown in the location plans also included in **Appendix L.1**.
 - (b) A site name, or where a site does not have a proper name, a generic name is given in square brackets.
 - (c) All sites are grouped into one of five broad class-types: buildings and structures, geology and fauna, native reserves, occupied clearings, and railways, roads and tracks.
 - (d) General site locations are indicated in plans included in **Appendix L.1** with details regarding specific land parcels included in the tabulated data. Reference to a given land parcel does **not** in all cases indicate that an archaeological site (within the strict legal definition of the HNZPTA) is present within its bounds or that the entire parcel is of archaeological interest. In some instances, the list of parcels is merely an indicator of land that is considered to have archaeological potential.
 - (e) A brief description for most sites is provided.
 - (f) The sources of information are listed as either map, photo, text or personal communication sources (meaning as indicated by discussions or correspondence with individuals or groups).
43. Information provided in the site descriptions is not meant to provide a comprehensive discussion of the site and its background history, but is intended to provide a brief overview of the most pertinent site history information.

Values and effects scoping

44. The RMA and HNZPTA promote the identification, protection, preservation and conservation of historical and cultural heritage, with the HNZPTA also providing a legislative mechanism, via an authority process, for the management of the modification or destruction of archaeological sites. Under the authority process HNZPT requires and where adequate

information is available, applicants must address effects to six archaeological values:

- (a) condition;
- (b) rarity or uniqueness;
- (c) contextual value;
- (d) information potential;
- (e) amenity value; and
- (f) cultural associations.

45. HNZPT also recognises other values identified in the RMA that may be addressed,² but most of these are either inapplicable or more directly addressed in other technical reports.³
46. As the focus of this assessment is archaeological sites, HNZPT's scheme of archaeological values is the most appropriate framework for assessing the values of the sites addressed in this report, with the addition of a general historic value as recognised in the RMA. It is noted that not all of the values recognised by HNZPT could be addressed as part of the assessment because inadequate information was available to assess the value condition. There was a lack of surface visibility at some sites, and this was removed as a factor to avoid unbalanced results where some sites were assessed by 5 values, and others 6. For this reason, and the fact that Waka Kotahi is not at this time applying to HNZPT for an archaeological authority, the condition is not included in the assessment. An overview of HNZPT's guidance regarding the assessment of archaeological values is provided in **Appendix L.2**, and the adopted approach is consistent with this guidance.
47. For each site the archaeological values and the one additional historic value were assessed as being of either nil, low, medium or high value and scored on a 0 to 3 scale. The qualitative values are converted to a numeric scale so that the values can be aggregated to a single overall value, that is, the total heritage value, with a maximum possible total score for a site being 18 and conversely 0 being the minimum. Scores that approach the maximum indicate a site of national or international significance, while scores below 5

² Architectural, historic, scientific, technological, aesthetic/visual impact and cultural values.

³ For architectural values, see Ian Bowman's Technical Assessment M (Built Heritage); for cultural values, see Muaūpoko and Ngāti Raukawa's Cultural Impacts Assessments - Volume V.

indicate low value sites of limited local interest. Mid-level sites that score between 5 and 10 have, or may have, local or regional significance.

48. The purpose of the total heritage value is to enable sites with the highest overall values to be easily identified. Adverse effects on sites with higher total heritage values are likely to have a more detrimental effect on the integrity and value of the overall archaeological record, therefore greater effort should be made to avoid or minimise adverse effects on these sites. Where avoidance is not possible, a higher degree of mitigation to minimise effects is likely to be required for higher value sites as opposed to lower value sites.
49. Waka Kotahi has maximised the avoidance of adverse effects to archaeological sites in its selection of an eastern corridor for further development. Technical constraints of the Project mean there is limited scope for further avoidance measures within the construction footprint, though there may be scope for further avoidance within the wider proposed designations.
50. A site's archaeological potential is evaluated as a combined measure of the quality of a site's spatial information and the possibility that the archaeological values discussed above will be affected. Archaeological potential is scored on a 5-point qualitative scale, from 'negligible', 'minor', 'low', 'moderate' archaeological potential to 'verified' archaeological value according to the decision matrix shown in **Table L.1**. Archaeological potential increases as a function of the quality of the spatial information available and the certainty that an archaeological site, as defined in the HNZPTA, will be affected. In this assessment, a verified archaeological site is a location, building or object that fulfils the statutory requirements to be considered an archaeological site under the HNZTPA and where the location and extent of the site are known to a high precision.

Table L.1 Decision matrix for determining site potential.

SITE POTENTIAL			
Spatial Quality	Will Archaeological Values be Affected?		
	Possibly	High Probability	Known
Nil / Estimate	Negligible	Minor	Low
Location	Minor	Low	Moderate
Location + Extent	Low	Moderate	Verified

51. The potential effect of the Ō2NL Project on any given site is scored on a similar 5-point qualitative scale from 'negligible', 'minor', 'low' and 'moderate' to 'significant' adverse effect and is assessed on the basis of a worst-case scenario that incorporates the following general assumptions:
- (a) that archaeological remains are present within the Ō2NL Project's proposed designation extent at all sites listed in **Appendix L.1**, including those with less than verified archaeological potential;
 - (b) that these remains provide, or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand and are thus protected by the HNZPTA;
 - (c) that archaeological remains within the construction footprint of the Ō2NL Project's indicative alignment will be destroyed during construction;
 - (d) that archaeological remains inside the proposed designations but outside of the construction footprint may be destroyed, but minor damage or protection/avoidance is a more likely outcome; and
 - (e) that as a minimum, all adversely affected archaeological remains are excavated and reported in keeping with standard archaeological practice and the terms of any archaeological authorities that may be granted by HNZPT.
52. The level of actual or potential adverse effect depends on the archaeological values of the site and the nature and extent of the adverse effect. High value archaeological sites generally experience higher levels of effect as mitigation measures cannot fully account for the loss of the physical site. The assessment of adverse effects to lower value archaeological sites starts at a lower point on the effects scale and is more likely to reach negligible or minor levels with appropriate mitigation.
53. A summary of the expected archaeological values, archaeological potential and predicted mitigated effects is provided below, and tables with the complete dataset are provided in **Appendix L.3**.

National and international best practice criteria

54. This assessment has been undertaken in a manner keeping with the following best practice guidance:
- (a) Waka Kotahi Historic Heritage Impact Assessment Guide for State highway projects (2015);

- (b) the ICOMOS New Zealand Charter (2010); and
- (c) HNZPT's Sustainable Management of Historic Heritage and Archaeological Assessment of Effects guidance.

Statutory considerations, including national standards, regional and district plans, and other relevant policies

55. Historic heritage (which includes archaeological sites) is a non-renewable resource and its protection from inappropriate subdivision, use and development is recognised as a matter of national importance in section 6(f) of the RMA. Regional and district plan provisions achieve the purpose and principles of the RMA through objectives and policies that promote or prioritise the protection of historic heritage from inappropriate subdivision, use and development. As set out above, there are no scheduled historic heritage or mana whenua/wāhi tapu sites in the PNRP, the One Plan, or HDP that are located within the proposed designations. There is one potentially relevant scheduled heritage site in the KCDP.
56. All archaeological sites, regardless of if they are registered historic places, recorded archaeological sites, known or previously unknown, are protected from unauthorised damage or destruction under the terms of the HNZPTA. Any person intending to carry out work that may modify or destroy an archaeological site must first obtain an authority from HNZPT. This process applies on land of all tenure, including public, private and designated land. The HNZPTA contains penalties for unauthorised site damage and destruction.

HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

57. The relatively sparse archaeological environment of the Ō2NL Project landscape is a product of two factors:
- (a) the physical environment; and
 - (b) the historical background.

Physical environment

58. The Ō2NL Project follows a generally north-south orientation that crosses a range of geological contexts from low terraces of Late Pleistocene beach deposits (incised by small streams and creeks at the southern and northern extents), to broad alluvial plains that were formed during the Late Pleistocene and the Holocene (GNS, 2021). Prior to its settlement by Europeans in the late 19th century, this landscape was cloaked in a dense podocarp forest, the

dominant species being tōtara, matai, rimu and rata (Duguid, 1990: 388). Smaller species such as tawa, karaka, mahoe, rewarewa, maire and hinau, amongst others, had also colonised the plains and forest margins. The forest was inhabited by a multitude of birds, including the huia that was highly prized by Māori for its tail feathers and for which the Horowhenua District was a well-known hunting ground; moa had also roamed the forest floor (Worthy, 1989: 423). The rivers and streams that flowed from the mountains and foothills were inhabited by tuna (eel), inanga (whitebait), kōkopu (freshwater fish), kōura (freshwater crayfish) and kākahi (freshwater mussel).

59. This forest was occupied by Māori, but the intensity and extent of their occupation activity was much lower than was the case in the more open dune lands to west. **Figure L.1** illustrates the extent of the forested area in 1872. Māori occupation of the forest was predominantly focused on the collection of natural resources such as timber and edible fruits, or hunting (birds and rats) and freshwater fisheries (Dreaver, 1984: 22, 158); some places were also associated with ritual activity.⁴ Natural openings on the banks of rivers and streams that crossed the forest were one focal point for these types of activities, the other being natural and human-made clearings located deeper in the forest that were accessed by a network of trackways. The Ō2NL Project crosses a small number of Māori trackways, but there are no known clearings located within proposed designations.
60. Following the completion of the Wellington-Manawatū Railway in 1886, the forest that had stood for centuries was rapidly felled and cleared by a burgeoning settler population. Within a period of 20 years only the barest remnants of the forest remained (Park, 1995: 269), a situation driven by Government conditions, backed by the threat of penal rates (Park, 1995: 202), that required the incoming settlers to clear and build on their sections within two years of purchase (Duguid, 1990: 388). As the rich and diverse flora and fauna of the old forest receded, new life in the form of introduced livestock and cultivars emerged from amongst the periphery of the towns and villages that were established along new networks of road and rail. This predominantly agricultural landscape, mixed with areas of light residential occupation, has persisted over the almost 140 years since the completion of

⁴For example, Kawana Hunia te Hakeke's testimony regarding "To Waihau I went to remove the tapu", stated before the Māori Land Court during the hearing of the Horowhenua Block case, on 29th March 1873.

the Wellington-Manawatū Railway and it this landscape that the Ō2NL Project will traverse.

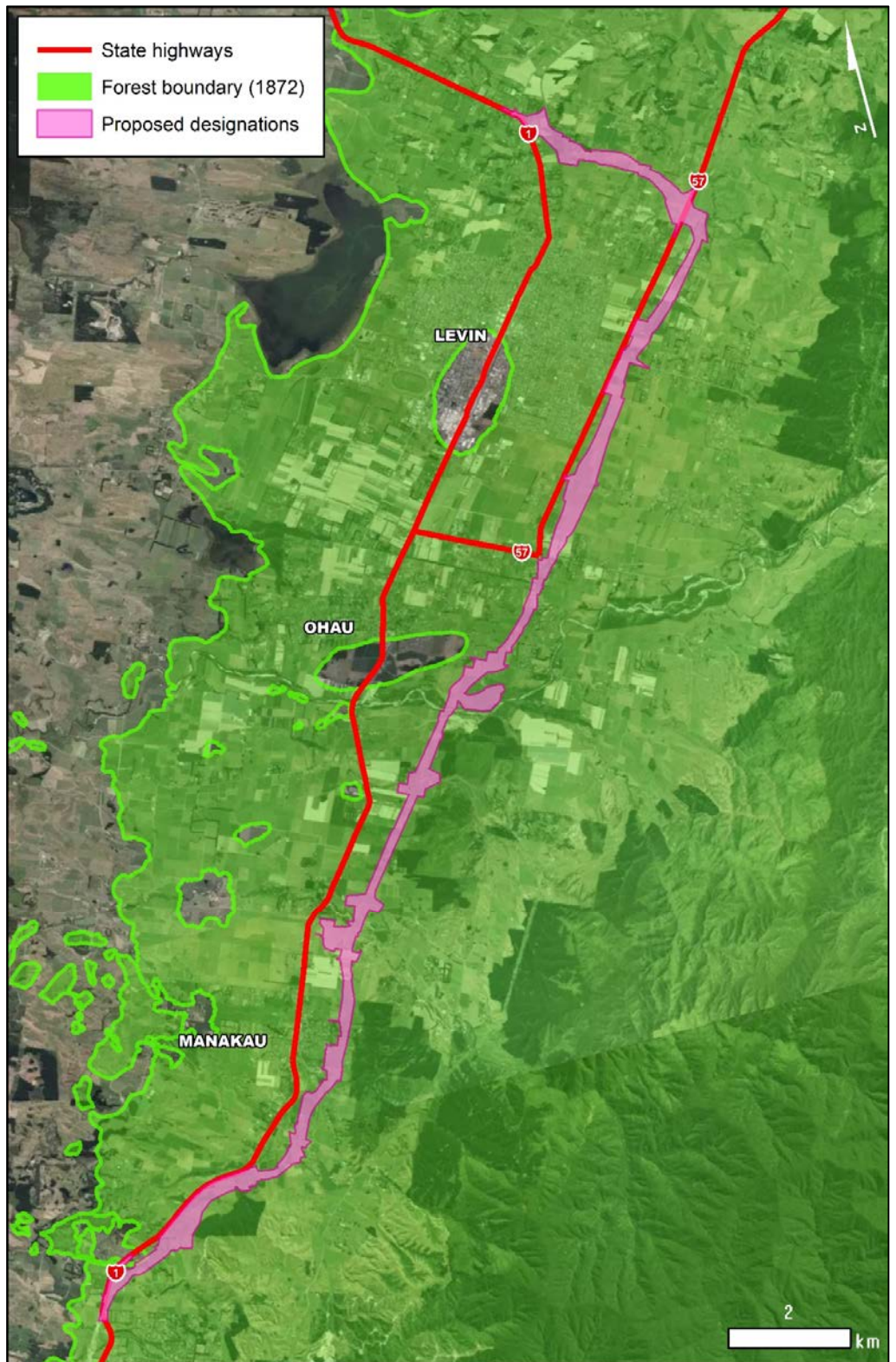


Figure L.1 Plan of the Ō2NL Project's proposed designations presented with the forest boundary and major clearings.⁵

Historical background

61. Radiocarbon (C14) determinations from coastal sites to the north and south indicate that Māori have occupied this part of the New Zealand coast for more than 700 years.⁶ Until the late-19th century, the major settlements and occupation sites of the various local iwi were predominantly located amongst the coastal dunes and adjacent to the major rivers, streams, swamps, lagoons and inland lakes. There are no known Māori settlements located within the proposed designations. Although the former forest was occupied by Māori, as noted above, the general disposition of Māori settlement and activity was to further west, beyond the proposed designations.
62. There are two schools of opinion regarding Muaūpoko origins. Some believe that Muaūpoko are descendants of tupuna who arrived on the Kurahaupō waka and others that the Muaūpoko were already resident when the waka arrived. Archaeological evidence, court records and Māori oral histories indicate there was a progression of groups that have inhabited the Horowhenua district over the past 1000 to 800 years (Adkin, 1948: 108-129; Waitangi Tribunal, 2017: 31-35), among these people being the Waitaha, Ngāti Māmoe, Ngāti Tara, Ngāti Hotu and Muaūpoko. Over time, the Muaūpoko established a regional identity through a combination of prolonged occupation (ahi-kā-roa), battle and intermarriage. Some of the former people groups were absorbed into the Muaūpoko identity, while others migrated to places outside of the district.
63. Between 1820 and 1840 there was a renewed period of Māori migration into the district as iwi from the Waikato and northern Taranaki were forced south by northern iwi who had obtained European firearms and were using these to expand their territory or settle old grievances (Matheson, 1978: 6). The Ngāti Toa, led by Te Rauparaha, migrated from Kawhia in the early 1820s and established a base at Kāpiti, eventually settling throughout much of the southern Horowhenua and Kāpiti districts. Te Rauparaha invited Ngāti Raukawa to establish settlements in the land. However, it was only upon receiving a later invitation from Te Rauparaha's sister, Waitohi, who shared Ngāti Raukawa descent through her mother, Parekohatu, that Ngāti

⁵ Forest boundary sourced from Survey Office plan 11039, dated 1872.

⁶ See reference dates WK1757 and NZ0682 from the NZ Radiocarbon Database, at www.radiocarbon dating.govt.nz.

Raukawa and their affiliates (including Kauwhata, Tukorehe and Wehiwehi) agreed to come, eventually establishing settlements from Kāpiti in the south to the Rangitikei in the north. Some, such Ngāti Kauwhata, who were among the first of the Raukawa identifying or affiliated peoples to make the journey south (McBurney, 2013: 121), first settled in the south near Ōtaki and Waikanae before eventually establishing permanent settlements north of the Manawatū River.

64. The first European residents in the Horowhenua were predominantly whalers or traders who arrived in the early decades of the 19th century (Bevan sen., 1907:18; O'Donnell, 1929). These hardy individuals lived in or nearby the Māori settlements among the coastal dune belt, with whom they traded for raw materials that could be on sold in the Wakefield settlements or exported to the booming markets in Sydney (Bevan sen., 1907:24; Dreaver, 1984:34).
65. Arriving at Rangiuru, Ōtaki, in 1832, Hector McDonald was the first permanent European resident in the Horowhenua. He later moved north to the mouth of the Hokio Stream where he established an accommodation house and leased substantial tracts of land from local Māori. While the pace of European settlement increased after the signing of the Treaty in 1840, few held land outside the main Māori or colonial settlements. By the early 1870s just six men held leases, from local Māori, for the whole of the coastal land from Ōtaki to the Manawatū River (O'Donnell, 1929: 2). While the leases and livestock were held by the settlers, management of the runs was a collaborative effort and it was local Māori that provided the labour to keep them functional.
66. The completion of the Wellington-Manawatū Railway (now part of the NIMT) in 1886 radically changed the pace and focus of settlement activity in the district. In particular, European settlement shifted inland to be nearer the railway line that was now the primary transportation, trade and communication route to Wellington. As noted above, new settlers arriving at the burgeoning settlements of Ōtaki, Manakau, Ōhau and Levin set about felling the standing forest, fulfilling the terms of their government contracts, in order to 'improve' the land. The transformation of the Horowhenua landscape from dense forest to open plains and hills was so rapid that Park (1995: 269) states, "*Never before or since has a New Zealand landscape been so quickly and ruthlessly 'cleared'. Within 20 years of the forest tunnel [Wellington-Manawatū Railway] being cut, only nature's geological lineaments were still there*".

EXISTING ARCHAEOLOGICAL ENVIRONMENT

67. There are no New Zealand Heritage List/Rārangi Kōrero places/areas or NZAA recorded sites within the Ō2NL Project's proposed designations.
68. There are no sites with significant mana whenua or historic heritage values scheduled in the PNRP within the proposed designations. There are also no wāhi tapu or historic heritage areas scheduled in the KCDP within the proposed designation in Kāpiti Coast District, though a heritage trail sign (historic heritage place B70) referring to a site outside of the proposed designation is located within the proposed designation.
69. GWRC's 'Likelihood of Uncovering an Archaeological Site' regional planning layer indicates there is a mostly medium to medium-low likelihood of encountering archaeological sites at the southern extent of the Ō2NL Project, rising to high in a few restricted areas along the western boundary of the proposed designations. However, a recent geophysical investigation (Parker and Bader, 2020) undertaken for the Ō2NL Project indicates that archaeological sites are unlikely to be present in most of the identified high likelihood areas within the proposed designations.
70. In respect of the One Plan and the HDP, there are no listed historic heritage or wāhi tapu sites in the proposed designation in the Horizons and HDC jurisdictions.
71. Following the definitions and data collection methods outlined above, 13 verified and 46 potential archaeological sites were identified within the proposed designations. **Figure L.2** shows the site counts grouped by archaeological potential and site type. As discussed above, verified archaeological sites are those that are identified to a known location and extent within the proposed designations where they meet the HNZPTA definition of an archaeological site. The 13 verified sites are the main focus of this assessment as these are the only sites that are certain to be affected by the Ō2NL Project.

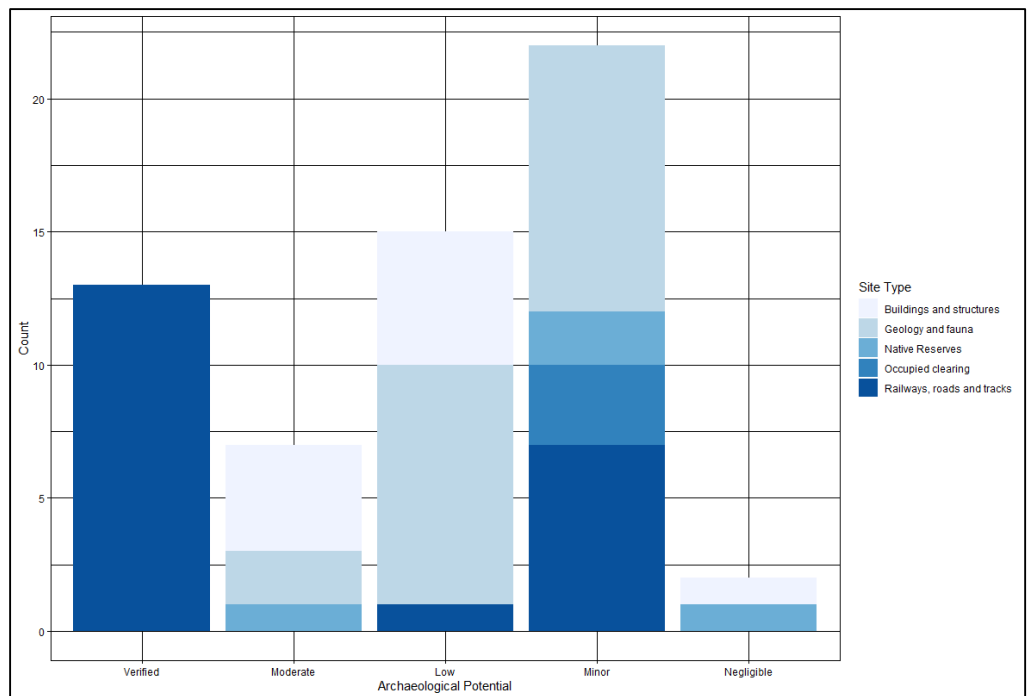


Figure L.2 Site counts grouped by archaeological potential and site type.

72. Archaeological remains may be present at a small number of the 46 potential archaeological sites, but there is little or no direct evidence to definitively indicate that archaeological remains are located at these sites inside the proposed designations and that they will be affected by the Ō2NL Project. As there is no certainty that these sites will be affected, a full discussion of potential archaeological values, effects and mitigations is not included in the main body of this report, but is instead provided as **Appendix L.4**. This information is relevant to the extent that it will be incorporated into the Ō2NL Project’s Historic Heritage Management Plan (“**HHMP**”) that will inform staff, Project Iwi Partners, contractors and other parties about the nature and significance of the heritage landscape and the legal requirements of the archaeological authorities that are to be sought from HNZPT.
73. The heritage value of the Ō2NL Project landscape as a whole is low. The dominant historic heritage features are prominent geological landforms within or peripheral to the proposed designations that shape the present landscape. However, for most of history the podocarp forest was the dominant feature of the landscape. The clear-felling of the forest in the late 19th century and the subsequent secondary effects – such as the loss of bird and fish life – have not just removed the economic context for most of the historic occupation of this landscape, but has almost totally erased the sense of space and place that once existed. As Māori occupation was structured by the forest and the

resources within it, and European occupation was tied by the highly fertile soils that were a product of the long-standing forest, the historic context of Māori and European occupation is tied to a landscape that no longer exists.

Verified archaeological sites

74. All verified archaeological sites within the proposed designations fall into the 'railways, roads and tracks' category of sites, with all but one being existing or former roads that were built during the 19th century. The location of these sites is shown on **Figure L.3**. The total heritage value for all of these roads is low, with only low values for information potential, contextual, amenity and cultural association values. Rarity and additional historic values are nil.
75. Iron remains (most likely nails or spikes, the rails being made of timber) of a sawmillers tramway (site #7) in the former Kohitere Clearing were detected during a geophysical survey of this area (Parker and Bader, 2020: 17-19). This site has a medium level total heritage value that reflects the greater rarity and contextual values, as well as the historic significance of the late 19th century timber trade in the development of the Horowhenua District.

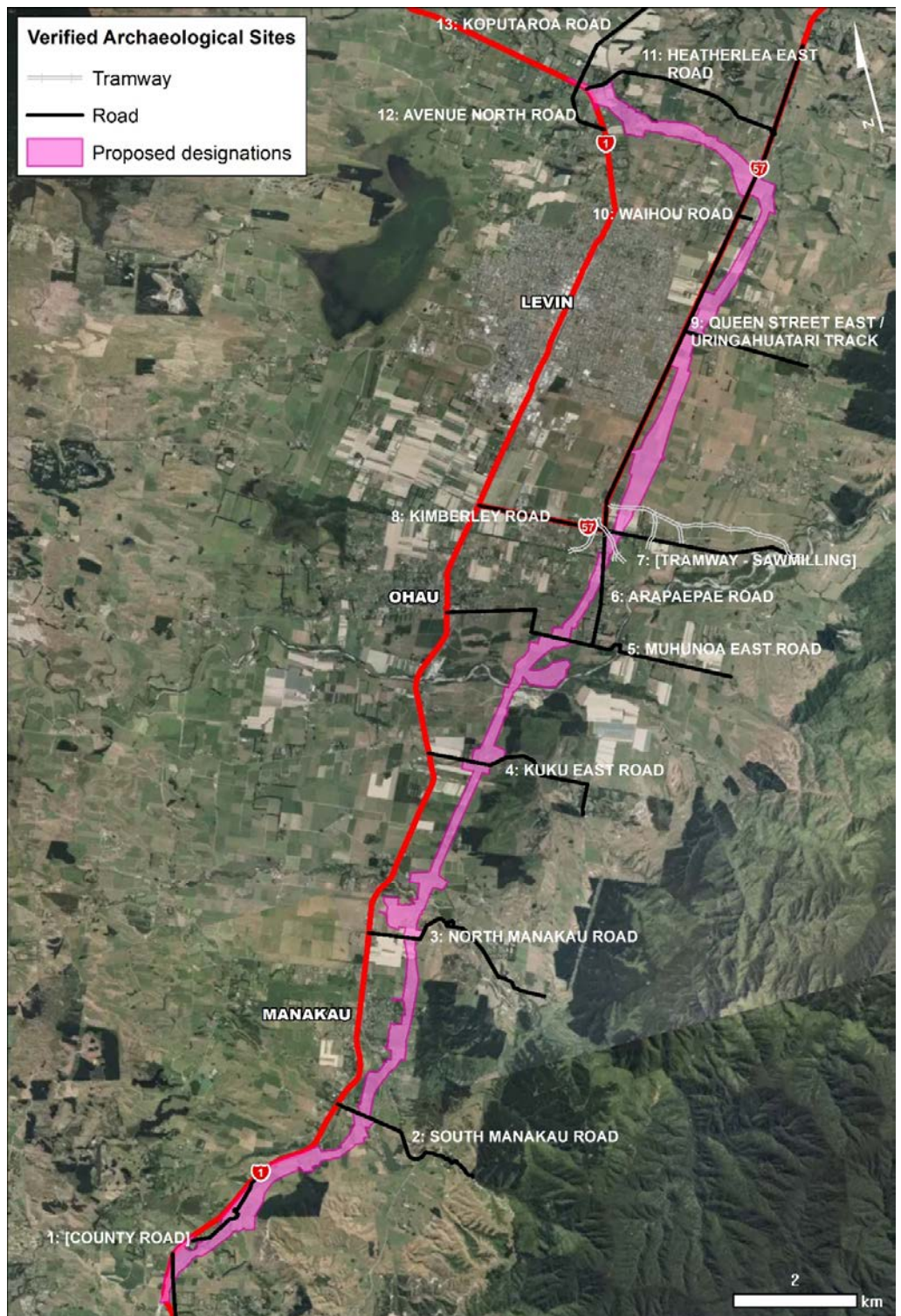


Figure L.3 Verified archaeological sites that will be affected by the Ō2NL Project. Twelve of the 13 sites are 19th century roads, the 13th being a former bush tramway servicing local sawmills.

Summary of potential archaeological sites

76. As mentioned above, there is little or no direct evidence to indicate that there are archaeological remains at any of the 46 potential archaeological sites

within the proposed designations that will be affected by the Ō2NL Project. However, the possibility that a small number of additional sites could be affected is recognised, and potential archaeological sites will be included in the development of the HHMP and archaeological authority applications. Of the 46 potential archaeological sites, the majority are of low or medium total heritage value but there are two sites that may have high archaeological values as follows:

- (a) Waiaute stream (site #24);⁷ and
- (b) Pukehou (site #23).

- 77. In terms of these sites, there is only a low and minor probability respectively, that archaeological remains associated with these sites will be found. This conclusion is reached based on recent geophysical survey results (Parker and Bader, 2020) and field observations during geotechnical soil investigations.
- 78. Seven sites of moderate archaeological potential that were identified from geophysical survey, aerial photographs or historic maps and documents are expected to be of low or medium value. There is a high likelihood that archaeological remains will be encountered at one or more of these moderate potential sites.⁸
- 79. Archaeological remains might be found at 15 sites of low archaeological potential, though this is generally not expected to be the case. Houses and house sites of low archaeological potential may pre-date 1900, but most are expected to be of early 20th century origin.⁹ Archaeological remains are likely to be present at location(s) alongside the waterbodies in this potential class, but there is only a low probability they will be found within the proposed designations.¹⁰

⁷ Referred to as the Waiaute stream in other documents and technical reports, the earliest 19th century survey plans spell the name as Waiaute, the Waiauti spelling not appearing on plans until the early 1880s. Both spellings are grammatically and syntactically correct as Māori place names, though the meaning (and potential archaeological significance) of the two ways of spelling is very different.

⁸ These seven sites are mix of potential Māori and European occupation sites. Archaeological remains at the former are likely to be in the form of shell midden, fire places/hāngī and possibly stone or bone tools. For the latter, a range of metal, ceramic, glass and earthenware items associated with residential occupation can be expected.

⁹ Houses that have not been inspected by built heritage specialist Ian Bowman (Technical Assessment M (Built Heritage)) are included as potential archaeological sites on a precautionary basis.

¹⁰ Any archaeological remains at these locations are likely to be similar as those described for the sites of moderate potential, as above.

80. Archaeological remains are not expected to be found at either of the 22 minor or two negligible archaeological potential sites. Sites of minor and negligible archaeological potential were defined on the basis of the following:
- (a) the results of a geophysical survey (Parker and Bader, 2020) indicating archaeological materials/sites are unlikely to be present;
 - (b) historic sources indicating that historic activity associated with a given site was predominantly located outside of the proposed designations or that the site was, broadly speaking, 'unoccupied'; and
 - (c) a reasonable expectation that ephemeral archaeological features are unlikely to have survived.
81. Unknown sites are most likely to be encountered adjacent to, or in the general proximity of, the waterbodies that make up a third of the sites in the aforementioned archaeological potential categories. Unknown sites may also be encountered in the vicinity of unnamed waterbodies or other locations removed from waterbodies, but there is no information to indicate that there is a high probability of this occurring.

PROJECT SHAPING AND AVOIDING AND MINIMISING EFFECTS

82. Key decisions to avoid or minimise adverse effects on archaeological sites were made during the consideration of alternative corridors for the Ō2NL Project, including the MCA process. Specifically, the elimination of corridors aligned to the west of the existing SH1 avoids a coastal landscape containing numerous pā and kāinga, hunting and cultivation grounds, colonial homesteads, battle sites, urupā and midden, amongst other sites. **Figure L.4** shows the various corridors relative to areas of low, medium and high archaeological potential. In doing so, the Ō2NL Project has protected the cultural and historic heritage landscape(s) from what would likely be significant adverse effects to numerous archaeological sites (Parker, 2017: 17-25).

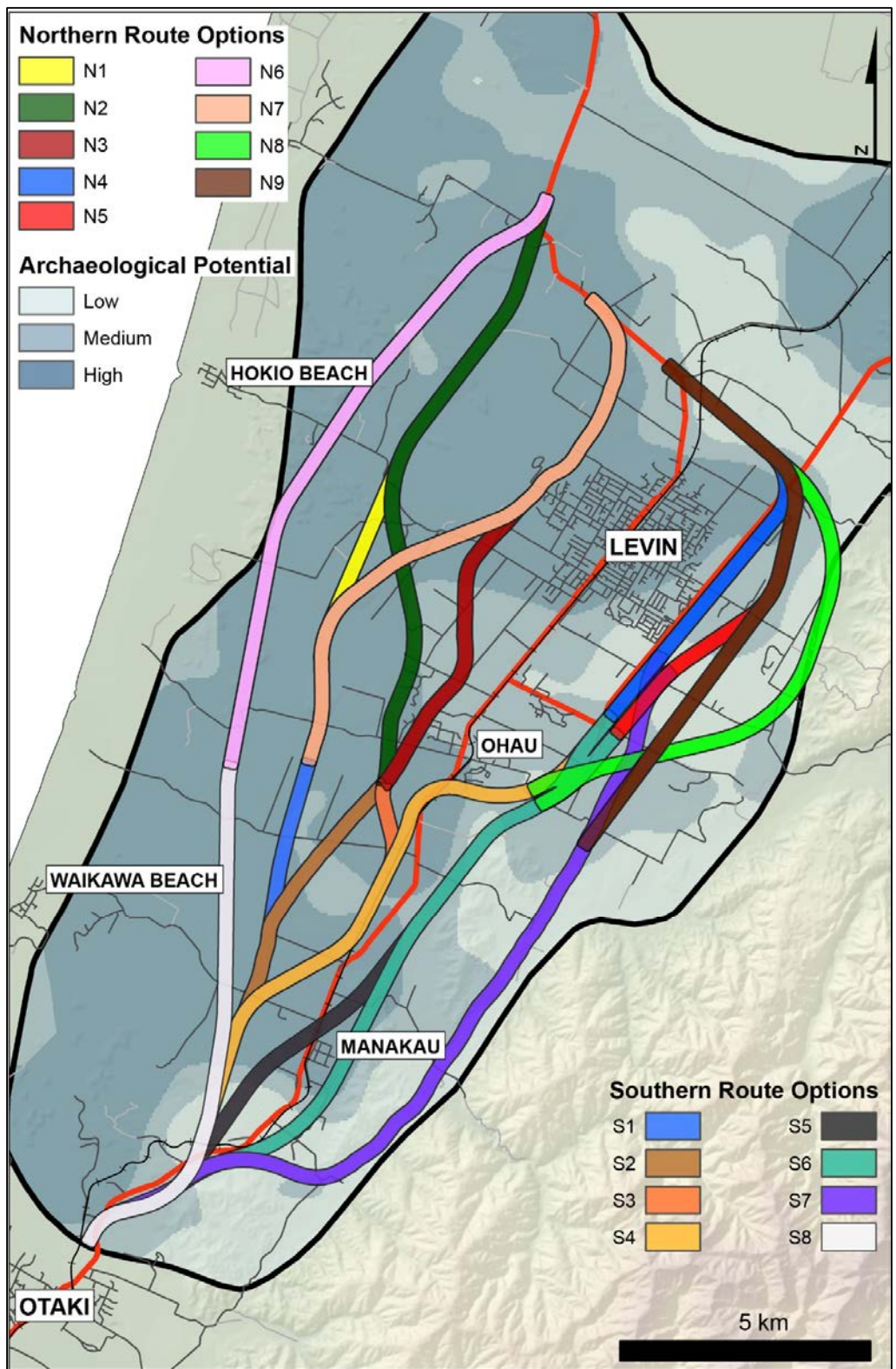


Figure L.4 Route options assessed and showing western routes for northern and southern options predominantly passing through areas of high archaeological potential.

83. The selection of the preferred S6-N4 route options for further design and investigation did not fully eliminate the potential for adverse effects to high

value archaeological sites. In particular, testimony given by Māori witnesses before the Māori Land Court in the late 19th century indicated there was the potential for two small settlements and an urupā to be affected in the vicinity of Pukehou and the Arapaepae South Road and Kimberley Road intersection (Parker and Bader, 2020: 1-3). Seeking further certainty of the possible effects to these potentially high value archaeological sites, Waka Kotahi commissioned a geophysical survey of the indicative alignment at these potential site locations.

84. No definitive evidence of settlement or urupā activity was detected in the vicinity of Pukehou, but magnetic signals consistent with a number of small fires, potentially associated with three hunting camps, were detected alongside gullies draining into the Waiwaro swamp (Parker and Bader, 2020: 11-14). Recent ground-testing of magnetic anomalies that were potentially associated with 19th century activity near Kimberley Road were determined to be of modern origin and are not archaeological. Design changes to avoid the Waiwaro swamp sites were not recommended because there is a reasonable expectation that other similar unknown sites are present in the immediate landscape and that any measures to avoid these sites will likely only result in effects to other, and as of yet unknown, sites.
85. The Ō2NL Project's proposed designations have been shaped to protect a small number of verified pre-1900 historic houses from physical adverse effects.¹¹ These houses may still be impacted by construction or operational effects on their amenity values (see Technical Assessment M (Built Heritage)), but as these archaeological sites will not be physically affected, they are not included in the list of sites for this assessment. Additionally, a small number of building and house sites (sites #17, #18 and #45) are located at the edge of the proposed designations but outside of the construction footprint. Changes to the proposed designations were not recommended for these sites as there is likely to be scope to avoid effects in these areas and any adverse effects that may occur are expected to be negligible.
86. The approach taken supports regional and district planning objectives and policies that prioritise the protection of historic heritage from inappropriate subdivision, use and development, which includes archaeological sites.

¹¹ i.e., The Prouse homestead, 'Ashleigh', at 1024 Queen Street East, Levin, or the former Sidey homestead at 101 North Manakau Road, Manakau.

87. Although prior decisions regarding the selection of route options for further investigation and development and refinement have consistently protected archaeological sites or significantly minimised their potential to be adversely affected, adverse effects cannot be entirely avoided. This is because the new highway would follow an approximately north-south indicative alignment in a landscape where a number of long and linear verified or potential archaeological sites run along an approximately east-west alignment. Archaeological remains are generally not expected to be found at potential sites, but the possibility cannot be entirely ruled out.
88. Mitigation measures to minimise unavoidable effects to archaeological sites will be managed through the archaeological authority process that is administered by HNZPT under the provisions of the HNZPTA. It is expected that this will require the excavation, recording, analysis and reporting ("excavation and reporting") of all archaeological sites located within the construction footprint of the new highway. Excavation and reporting may be required for archaeological sites located in the proposed designation, though avoidance and protection are likely to be viable options for some.
89. In many instances the archaeological authority process will not entirely eliminate adverse effects, as excavation and reporting are unlikely to fully compensate for the physical loss or modification of a site in its wider setting and landscape context. Instead, actions taken under the authority process help to ensure that any residual effects are reduced to an acceptably minimal level.

ASSESSMENT OF EFFECTS

90. Key factors for the assessment of potential effects to archaeological sites are the spatial extent of the proposed designations and the construction footprint within the proposed designations. The Ō2NL Project is likely to result in the destruction of all archaeological sites that fall within the construction footprint and these sites will require higher levels of mitigation for adverse effects. In addition to the new four-lane state highway, key construction features of the Ō2NL Project that may affect archaeological sites, include:
- (a) a grade separated diamond interchange at Tararua Road;
 - (b) two dual lane roundabouts where the indicative alignment crosses SH57/Arapaepae Road and where it connects with the current SH1 at Heatherlea East Road, north of Levin;

- (c) four lane bridges over the Waiaute, Waikawa and Kuku Streams and the Ōhau River and the NIMT rail line north of Levin;
 - (d) local road under or overpasses;
 - (e) local road reconnections and intersection improvements;
 - (f) stormwater treatment wetlands, stormwater swales, drains and sediment traps;
 - (g) culverts to reconnect streams crossed by the proposed works and stream diversions to recreate and reconnect streams; and
 - (h) a SUP for walking and cycling located generally along the entire length of the new highway.
91. Archaeological sites outside of the construction footprint but within the proposed designations are considered to be at risk but are likely to be less affected, or may not be affected at all, and a lower level of mitigation is expected to be required for these sites.
92. As noted in the methodology, effects are assessed on a 5-point scale from negligible to significant effect and assume the application of the minimum level of mitigation that is expected by HNZPT. When exposed to the same potential adverse effect, the level of adverse effect to medium and high value archaeological sites starts at the higher end of the effects scale (that is, significant or moderate) and, even with allowance for mitigation, retain a higher residual effect than those for medium or low value sites.
93. The 13 verified archaeological sites that will be adversely affected are long, linear sites with a predominantly east-west orientation and cannot be avoided. Most archaeological remains associated with these sites are located outside of the proposed designation and will not be affected by the Ō2NL Project.

Adverse effects

Construction effects on verified archaeological sites

94. Most adverse effects on archaeological sites, and associated values, are expected to occur during the construction or enabling works phase of the Ō2NL Project. With an allowance for actions to mitigate adverse effects through the archaeological authority process, as authorised by HNZPT and described in greater detail below, effects to verified archaeological sites, which are all in the category of 'railway, road and track' sites, will be negligible for the following reasons:

- (a) 19th century roads are common archaeological sites of low heritage value and only a small portion of each road will be affected;
- (b) similarly, only a small portion of the medium value sawmillers tramway (site #7) will be affected, the vast majority of this site is outside the proposed designation;
- (c) information that will be recovered through the excavation of the 19th roads will be adequately captured through photography or section drawings of the road (and any associated features, such as drainage ditches) profile;
- (d) archaeological remains of the sawmillers tramway are expected to be limited to a small number of nails or spikes, as indicated by the geophysical survey (Parker and Bader, 2020) and these will be excavated, surveyed and removed for preservation; and
- (e) public awareness and education of the presence and historic significance of the sawmillers tramway will be increased through signs and incorporation into design elements of the Ō2NL Project.

Operational effects on verified archaeological sites

95. The potential for on-going adverse effects to archaeological sites during the operational lifetime of the Ō2NL Project is expected to be limited. Any works to archaeological remains within the new highway's construction footprint (or the designations broadly) will require separate archaeological authorities (see paragraph 22), which will in turn likely require those remains to be fully recorded and removed by archaeological excavation during construction and/or may need on-going management and protection. The management of operational effects to a negligible level will be achieved through the notification and identification of in situ archaeological remains to contractors involved in maintenance or other works inside the proposed designations. Permanent protective fencing may need to be installed around any sites that are at frequent risk of being affected.

Possible construction and operational effects on potential archaeological sites

96. Excavation and reporting of any archaeological remains that may be found at potential archaeological sites or other unknown sites during construction or operational works is generally expected to result in a no more than negligible or minor residual effect (see **Appendix L.4**). However, as previously noted, archaeological remains are, for the most part, not expected to be found at these potential sites.

Positive effects

97. In addition to the new information that will be recovered in the course of any archaeological excavations that may take place, aspects of the archaeological and wider heritage landscape will be highlighted and enhanced through their recognition and incorporation in the signs, artwork and design features of the Ō2NL Project as generally described in the Cultural and Environmental Design Framework ("**CEDF**") (Volume II, Appendix Three). This will include:
- (a) restoration of original Māori names where possible;
 - (b) use of art or interpretative signs to highlight historic sites or landmarks; and
 - (c) the inclusion of heritage inspired design in construction and landscape features.
98. Construction of the SUP will improve the accessibility of the KCDC heritage trail sign at Pukehou, which is currently sited in a relatively isolated position alongside SH1.

SUMMARY RATING OF EFFECTS

99. While the Ō2NL Project's selection of the preferred eastern S6-N4 corridors for further development has had a significant positive effect in terms of the preservation and protection of the overall archaeological landscape, all effects to the sites that remain in its path will be adverse. However, adverse effects to verified archaeological sites, are expected to be negligible. Some minor and low-level effects may occur to sites with a moderate archaeological potential (but which are not yet verified as archaeological sites). Archaeological remains are generally not expected to be found at sites of low, minor or negligible archaeological potential, but where this does occur the effects are expected to be mostly minor or negligible.
100. The generally negligible or minor levels of effect reflect the Ō2NL Project's position in a historic landscape that was predominantly under a dense cover of podocarp forest as shown in **Figure L.1**. High value archaeological sites associated with historic Māori occupation, such as pā and kāinga, urupā and cultivation grounds, that would be significantly affected by the construction of a new highway were generally located west of the existing highway. Geophysical survey results (Parker and Bader, 2020) indicate that a Ngāti Kauwhata settlement and urupā in the vicinity of Pukehou and a small Muaūpoko settlement in the Kohitere clearing (site #41) near the Kimberley

and Arapaepae roads are unlikely to be affected. No verified archaeological sites of Māori association will be affected by the Ō2NL Project, though there are a number of sites where there is the potential for archaeological remains to be found (as discussed in **Appendix 4**).

101. Similarly, archaeological sites associated with historic colonial occupation are mostly avoided. The proposed new highway is situated to the east of the main settlements where early residential occupation was most concentrated and the proposed designations have been shaped to avoid the known late 19th century rural houses and homesteads. Some effects are unavoidable because a small number of historic roads or tramways are aligned perpendicular to the proposed new highway.
102. The Ō2NL Project's adverse effects on verified archaeological sites will be negligible. However, it is reasonable to expect that archaeological remains will be found at some sites of less than verified archaeological potential, in which case the overall effect will be minor or less than minor. **Figure L.5** summarises the anticipated adverse effects, collated by reference to the scale of the effect, of the Ō2NL Project on archaeological sites, after mitigation (as set out below).

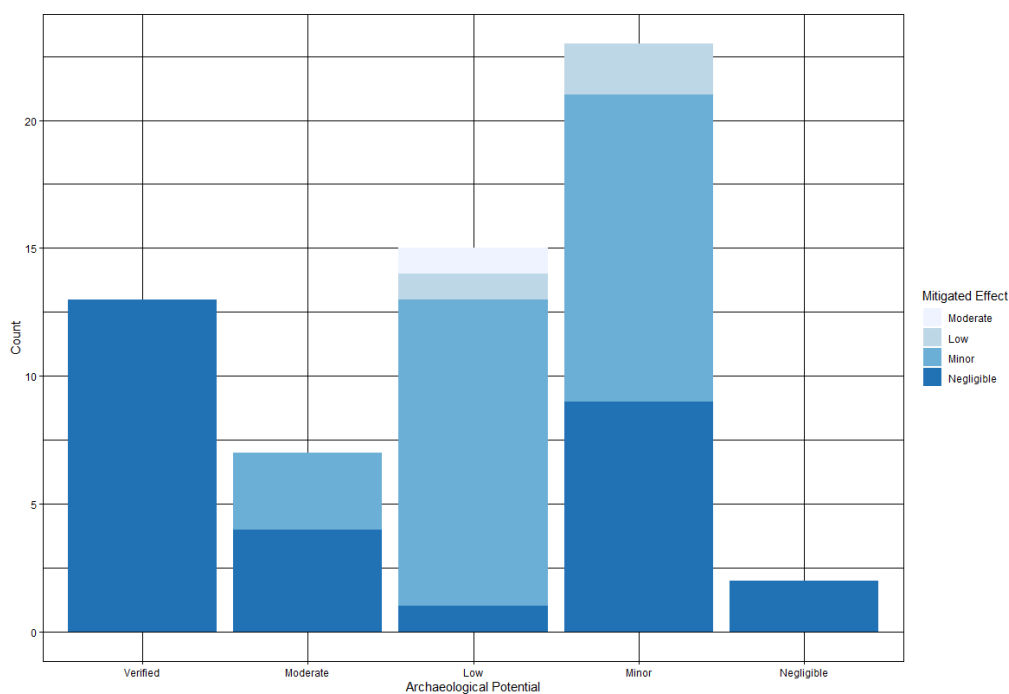


Figure L.5 Expected effect of the O2NL Project, after mitigation, on archaeological sites.¹²

MEASURES TO REMEDY OR MITIGATE ACTUAL OR POTENTIAL ADVERSE ARCHAEOLOGICAL EFFECTS

103. As previously noted, remedy for adverse effects to archaeological sites will be primarily managed via separate applications to HNZPT for archaeological authorities to damage, modify or destroy archaeological sites. At the advice of HNZPT, two archaeological authorities will be sought:

- (a) an authority with research strategy and management plans for all verified archaeological sites that are to be excavated or otherwise managed before construction starts; and
- (b) a second authority with a more flexible management plan for unknown archaeological sites that are found during the highway’s construction.

104. Conditions attached to any archaeological authorities that HNZPT may grant to the O2NL Project are expected to include, at a minimum:

- (a) that all contractors working on the Project are briefed by an approved person prior to any works commencing on the possibility of encountering archaeological evidence, how to identify possible

¹² Verified sites have a known location and extent and meet the formal legislative definition of an archaeological sites as defined in the HNZPTA. O2NL Project effects on potential archaeological sites are discussed in Appendix L.4.

archaeological sites during works, the archaeological work required by the conditions of this authority, and contractors' responsibilities with regard to notification of the discovery of archaeological evidence to ensure that the authority conditions are complied with;

- (b) that HNZPT is advised of the date when work will begin and that this advice is provided at least 2 working days before work starts. Also, that HNZPT is advised of the completion of the on-site archaeological work within 5 working days of completion;
- (c) that any archaeological evidence encountered during the exercise of this authority is investigated, recorded and analysed in accordance with current archaeological practice;
- (d) that access for Project Iwi Partners is enabled in order to undertake tikanga consistent with any requirements of site safety and that Project Iwi Partners are informed 48 hours before the start and finish of any archaeological work;
- (e) if any kōiwi (human remains) are encountered, all work should cease within 20m of the discovery, and the HNZPT Archaeologist, New Zealand Police and Project Iwi Partners are to be advised immediately and no further work in the area may take place until future actions have been agreed by all parties;
- (f) that Project Iwi Partners shall be informed if any possible taonga or Māori artefacts are identified to enable appropriate tikanga to be undertaken;
- (g) that Project Iwi Partners are provided with a copy of any report completed as a result of the archaeological work and are given an opportunity to discuss it with the s 45 (of the HNZPTA) approved person if required; and
- (h) that a final report, completed to the satisfaction of HNZPT, is submitted to the HNZPT archaeologist.

105. Further research will be required to prepare an archaeological assessment that will be submitted with the applications for archaeological authorities. An HHMP will also be developed to inform the Ō2NL Project's staff, Project Iwi Partners, contractors and other parties about the nature and significance of the heritage landscape and the legal requirements of the archaeological authorities that are to be sought from HNZPT. The HHMP will encompass both archaeological sites and built heritage, and is likely to include:

- (a) archaeological assessments, heritage impact assessments, granted authorities, final archaeological reports and updated site record forms (NZAA ArchSite) prepared / submitted since the time of the granting of any designation;
- (b) details of specific areas to be investigated, monitored and recorded to the extent these are directly affected by the Ō2NL Project;
- (c) roles, responsibilities and contact details of Ō2NL Project personnel, Project Iwi Partner representatives, and relevant agencies involved with heritage and archaeological matters including surveys, monitoring of works, and monitoring of conditions;
- (d) methods to acknowledge cultural values where archaeological sites also involve Ngā Taonga Tuku Iho (treasures handed down by our ancestors) and where feasible and practicable to do so;
- (e) methods for protecting or minimising the Ō2NL Project's adverse effects on heritage and archaeological sites within the proposed designation during works as far as practicable;
- (f) training requirements for contractors and subcontractors on heritage and archaeological sites within the proposed designation, legal obligations relating to discoveries, and tikanga / cultural protocols agreed with Project Iwi Partners;
- (g) archaeological discovery protocols setting out standard practices to be followed by all Ō2NL Project personnel in the event that actual or potential archaeological remains are found when an archaeologist is not on site; and
- (h) measures to mitigate adverse effects on historic heritage that achieve positive heritage outcomes.

106. Overall, effects on verified archaeological sites are expected to be negligible, possibly rising to minor if other potential archaeological sites are found during works.

Proposed mitigation measures

Enabling and construction works

107. It is intended that all works within the new highway's construction footprint and the proposed designations will be covered by two archaeological authorities that are to be sought from HNZPT. Information and methods contained in the HHMP, in particular the training of contractors and

subcontractors and the implementation of standard archaeological discovery protocols, will help to minimise the potential for archaeological sites to be significantly adversely affected prior to and during the main construction works.

108. As previously noted, aspects of the archaeological and wider heritage landscape will be incorporated into the design features of the Ō2NL Project. In particular, the placement of interpretative signage and artwork along the SUP drawing on recovered archaeological and cultural information will highlight and enhance public recognition of the historic heritage landscape.

Operational

109. No mitigation will be required for the operation of the highway. Maintenance or upgrade works within the construction footprint of the new highway will not affect archaeological sites; these sites having been destroyed during the construction works themselves.
110. Operational works within the proposed designations may affect archaeological sites where permanent protective fencing or marking is not able to be installed. If maintenance or upgrade works are likely to affect verified or potential archaeological sites and the archaeological authorities received for the construction works have expired, new authorities will need to be acquired from HNZPT. Where works are unlikely to affect verified or potential archaeological sites, unintended adverse effects within the proposed designation can be mitigated to a negligible level by implementing the discovery protocol embedded in the proposed NoR conditions or the conditions of any archaeological authority that is approved by HNZPT.

CONCLUSION

111. From Ōtaki to north of Levin, the Ō2NL Project is situated in a landscape that has been cloaked in a dense and relatively impenetrable podocarp forest until the late 19th century. While this forest has been inhabited by Māori for many centuries, the intensity and extent of occupation is much lower than was the case in the open land lying to the west, beyond the forest edge. The clearance of the forests by European settlers radically changed the physical appearance of the landscape, but the intensity of occupation has remained relatively low through to the present time; historic residential centres are located to the west of the proposed designations and verified historic houses or homesteads have been avoided.

112. There are 13 verified archaeological sites within the proposed designations, all of which are low or medium value 19th century roads or sawmillers tramways. These sites will be negligibly affected by the Ō2NL Project.
113. Overall, the Ō2NL Project will have a relatively minor impact on the known archaeological landscape and the adverse environmental effects are expected to be negligible. Waka Kotahi has taken appropriate action to:
- (a) protect the wider archaeological landscape and avoid significant adverse effects;
 - (b) ensure that the potential remaining effects can be appropriately managed through the archaeological authority process; and
 - (c) mitigate adverse effects through positive opportunities to incorporate archaeological and cultural information in the Ō2NL Project's design framework.



Daniel Parker

14 October 2022

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APPENDIX L.1: DESCRIPTIONS, DETAILS AND LOCATION MAPS OF VERIFIED AND POTENTIAL ARCHAEOLOGICAL SITES

Table L.2 Verified archaeological sites within the proposed designations of the Ō2NL Project.

Site ID	Site Name	Site Type	Parcel	Description	Map Source	Photo Source	Text Source	Pers. Comm
1	[county road]	Railways, roads and tracks	Part Section 1 SO 17751, Pukehou 5L1A1 Block SO 489585, Lot 7 DP 87750, Lot 10 DP 87750, Lot 8 DP 87750, Lot 1 DP 54714, Lot 9 DP 87750	A former alignment of the county road that was replaced by a deviation along the line of the existing SH 1.	SO 13155, SO 13154, ML 1031			
2	South Manakau Road	Railways, roads and tracks		A local road that was constructed in the 19th century.	SO 12698, SO 12699, SO 13760			
3	North Manakau Road	Railways, roads and tracks		A local road that was constructed in the 19th century.	SO 12698			
4	Kuku East Road	Railways, roads and tracks		A local road that was constructed in the 19th century.	SO 13496			

5	Muhunoa East Road	Railways, roads and tracks		A local road that was constructed in the 19th century.	SO 12978			
6	Arapaepae Road	Railways, roads and tracks		A local road that was constructed in the 19th century.	DP 439, SO 14541, SO 12913, ML 1099			
7	[tramway - sawmilling]	Railways, roads and tracks	Lot 1 DP 29076, Lot 1 DP 69127, Part Section 68 Horowhenua East SETT, Lot 1 DP 23429, Section 66A Horowhenua East SETT, Lot 2 DP 23429	Multiple tramways crossing the Kohitere clearing and leading to Bartholomew's mill at Florida Road and possibly to mills at Ohau as well.	SO 14541			
8	Kimberley Road	Railways, roads and tracks		A local road that was constructed in the 19th century.	SO 14541			
9	Queen Street East / Uringahuatari track	Railways, roads and tracks		A local road that was constructed in the 19th century and which follows the path of the Uringahuatari track that	SO 12913			

				linked Lake Horowhenua to the Tararua Range.				
10	Waihou Road	Railways, roads and tracks		A local road that was constructed in the 19th century.	ML 1099			
11	Heatherlea East Road	Railways, roads and tracks		A local road that was constructed in the 19th century.	DP 872			
12	Avenue North Road	Railways, roads and tracks		A local road that was constructed in the 19th century.	SO 13005			
13	Koputaroa Road	Railways, roads and tracks		A local road that was constructed in the 19th century.	SO 13005			

Table L.3 Potential archaeological sites within or in close proximity to the proposed designations of the Ō2NL Project.

Site ID	Site Name	Site Type	Parcel	Description	Map Source	Photo Source	Text Source	Pers. Comm
14	Waitohu stream	Geology and fauna	Part Pukehou 5L2A Block	According to Eldson Best the Waitohu stream was named after a sign or marker (i.e. tohu) left by Haunui-a-Nanaia, an early occupant of the area. The lower reaches of this stream to the east of SH1 were heavily occupied during the 19th century.	SO 11574		Eldson, B. (1927). HAU AND WAIRAKA. The Adventures of Kupe and His Relatives. The Journal of the Polynesian Society, 36(3)	
15	Waerengapoka clearing	Occupied clearing	Lot 1 DP 371211, Lot 1 DP 31303, Lot 2 DP 371211	A cultivated clearing of Ngati Kauwhata and/or Ngati Pare.	SO 11039		MLC 12-05-1873	
16	Waiwaro swamp	Geology and fauna	Lot 1 DP 371211, Lot 1 DP 31303, Lot 2 DP 371211	A deep, watery swamp where hinaki were set for the taking of eels.	Wellington 2013 DEM		Horowhenua (Adkin, 1948)	

17	[building]	Buildings and structures		A small building, possibly a house, formerly standing at the base of Pukehou on the north side of a now abandoned county road. Any archaeological remains of this building may have already been destroyed by earthworks associated with the existing SH1.	PWD 8555			
18	[buildings]	Buildings and structures		Two small buildings, possibly a house and shed, formerly standing at the base of Pukehou on the north side of a now abandoned county road. The source map indicates these buildings are likely located underneath a slip road accessing property adjacent to the existing SH1.	PWD 8555			
19	[track]	Railways, roads and tracks	Lot 1 DP 31303, Lot 10 DP 87750, Lot 8 DP 87750, Lot 9 DP	Approximate location of an early inland walking trail on a roughly north-south orientation. There are substantial inaccuracies in	SO 11234			

			87750, Lot 2 DP 81659	the location of other landscape features in the source map and the track may be similarly misplaced.			
20	Pukehou Block No. 4A1	Native Reserves	Lot 7 DP 87750, Lot 10 DP 87750, Lot 8 DP 87750, Lot 9 DP 87750	A former native reserve owned by Eru Tahitangata. The wider Pukehou No. 4 Block was also owned by Hemi Ranapiri, Akapita te Tewe, Kararama te Whakaheke, Enoka Te Wano, Tamati Ranapiri, Aterea Te Waha, Aterea Tanehe, Mohi Heremia and Riria Tumi.	ML 367, SO 12699		Block Research Narratives, Vol III, Part IIB, Block Data Ngakaroro to Wi (Wai 2200, #A212(a))
21	Paruauku clearing	Occupied clearing	Lot 1 DP 31303, Lot 10 DP 87750, Lot 2 DP 81659	A large, cultivated clearing extending to the lower slopes of Pukehou, the ownership of which was strongly contested by multiple parties in the mid-19th C.	SO 11234, SO 11574		Horowhenua (Adkin, 1948)

22	Otepua swamp	Geology and fauna	Lot 7 DP 87750, Lot 6 DP 87749, Lot 5 DP 87749, Lot 2 DP 320898	The 'place of the edible seeds' or the 'bird snaring tree', a large swamp with a large clearing(s) on the banks that were cultivated west of SH1. Ownership of the land around this swamp was strongly contested by multiple parties in the mid-19th C.	ML 367, ML 1228, Wellington 2013 DEM		Horowhenua (Adkin, 1948)	
23	Pukehou	Geology and fauna		A prominent hill that is a general location marker for many events and sites that are only tentatively located. The hill itself was an important site for bird snaring/hunting, but burials and pā sites are also associated with this location.	ML 367, SO 11039		Horowhenua (Adkin, 1948)	
24	Waiaute stream	Geology and fauna	Part Lot 28 DP 415, Lot 1 DP 54757	The 'stream of the paper-mulberry (<i>Broussonetia papyrifera</i>)', the paper-mulberry (aute) was cultivated for the fabric that was derived from its bark. The Waiaute is a long stream that descends from	SO 11900, S 11574, SO 12698		Horowhenua (Adkin, 1948)	

				the eastern face of Pukehou and any sites associated with the cultivation of paper-mulberry may be located beyond the Ō2NL Project's extent.			
25	Manakau stream	Geology and fauna	Lot 3 DP 369031, Lot 1 DP 394488, Lot 2 DP 369031, Lot 1 DP 54757, Lot 2 DP 394488, Lot 3 DP 394488, Lot 20 DP 394488, Lot 21 DP 394488, Lot 19 DP 394488	The name of this stream is derived from the name said to have been applied by Te Rauparaha to the general area.	SO 11900, SO 12698		Horowhenua (Adkin, 1948)
26	Puketawhiwhi/Te Tahawahakarunga mangahua hill	Geology and fauna	Lot 2 DP 349423, Lot 1 DP 54937, Lot 4 DP 408558, Lot 3 DP 72857, Lot 2 DP 398440, Lot 1 DP 22763, Lot 1 DP 405870	The 'kōhūhū (<i>Pittosporum tenuifolium</i>) hill' or 'the hill above the Huia stream'. This hill was probably a regular camp site for Māori hunting huia.	SO 11038		Horowhenua (Adkin, 1948)

27	Puna (springs)	Geology and fauna	Lot 1 DP 69689, Lot 2 DP 396584	There are a small number of springs located between Puketawhiwhi/Te Tahawhakarungamangahui a and the Hanawera Ridge that are of cultural significance and may also be of archaeological significance.				Iwi
28	Mangahuia stream	Geology and fauna	Part Lot 3 DP 415, Lot 2 DP 415, Lot 2 DP 469288, Lot 2 DP 396584, Lot 3 DP 472237, Lot 3 DP 409803, Lot 1 DP 69689, Lot 4 DP 472237, Lot 1 DP 396584, Lot 1 DP 535861, Lot 1 DP 405870	A stream where the huia bird was plentiful. Huia were highly prized by Māori, with both the tail feathers and preserved heads of this bird worn as forms of personal adornment.	ML 888, Wellington 2013 DEM		Horowhenua (Adkin, 1948)	
29	Climie's track	Railways, roads and tracks	Lot 2 DP 454344, Lot 3 DP 454344, Lot 1 DP 454344, Section 1 SO	A track cut/used by the early survey J. D. Climie. Possibly following the path of an earlier Māori track.	SO 11900			

			442512, Part Manawatu-Kukutauaki 4E3,2B Block				
30	Waikawa River	Geology and fauna	Part Manawatu-Kukutauaki 4E3,2A2 Block, Part Manawatu-Kukutauaki 4E3,2B Block, Lot 3 DP 454344, Lot 1 DP 56388	Meaning 'bitter water', the lower reaches of this river were intensively settled.	SO 11456, SO 11574, SO 12698		
31	Waikawa Native Reserve	Native Reserves	Part Manawatu-Kukutauaki 4E3,2A2 Block, Section 1 SO 442512, Part Manawatu-Kukutauaki 4E3,2A2 Block	A large native reserve encompassing all of the Manawatu Kukutauaki Block No. 4. The 4E3 subdivision of the reserve was listed in the name of Riperata Wharekaka and 10 others.	ML 193		Block Research Narratives, Vol. IV, Part II, Land Occupation and Utilisation Case Study Data (Wai 2200, #A212(c))
32	Waikokopu stream	Geology and fauna	Lot 2 DP 384664, Ohau 3,4B2B Block,	The 'stream of the kōkopu', kōkopu being a relatively generic term used to			Horowhenua (Adkin, 1948)

			Ohau 3 Sbdn 15 and 16 No 2B Block, Part Ohau 3,1 Block, Part Ohau 3,4A Block, Ohau 3 Sbdn 15 and 16 No 1 Block	describe a number of small freshwater fish species.				
33	Kuku stream	Geology and fauna	Lot 1 DP 420651, Lot 2 DP 339388	The 'wood-pidgeon stream', a running battle occurred on the south bank of this stream with the victims of this battle left where they fell.	ML 1034, ML 915, SO 11574			Iwi
34	Otararere hill	Geology and fauna	Lot 1 DP 420651, Lot 2 DP 436230, Ohau 3 11D Block	A hill separated from the Poroporo Ridge by the Kuku Stream. The name was received from Arapata te Hiwi of Ngāti Tukorehe, but the origin is unknown.			Horowhenua (Adkin, 1948)	
35	[house]	Buildings and structures	Ohau 3,11D Block	Possible pre-1900 house site tentatively identified on the basis of the building footprint and a small number of established trees. Parts of this site are likely to have been		SN 181		

				adversely affected by the neighbouring quarry.			
36	Ōhau River	Geology and fauna	Ohau 3,11D Block, Lot 1 DP 75720	Taking its name from ancient ancestor Haunui-a-Nanaia (as for the Waitohu), there were many cultivation grounds located on the banks of the Ōhau River.	ML 1136, SO 11456, SO 11574		
37	[track]	Railways, roads and tracks	Lot 1 DP 75720	A track leading from the coast to paths crossing the Tararua Range was located on the north bank of the Ōhau River.	ML 595		
38	Muhunua Block No. 4	Native Reserves	Lot 1 DP 60994, Lot 2 DP 60994, Lot 3 DP 90212, Lot 4 DP 90212, Lot 5 DP 90212, Lot 2 DP 90212	A 100 acre native reserve set aside for Paranihia Whawha and Kipa Whatanui. The remaining block was proclaimed as being Waste Lands of the Crown on the 21st of October, 1880. The wider Muhunua Block No. 4 was also owned by Roera Hukiki, Tamehana Rauparaha, Kipa Te	DP 439		Block Research Narratives, Vol II, Part IIA, Block Data Ahitangata to Muhunua (Wai 2200, #A212(a))

				Whawha, Hoani Kuiti, Kiniwe Roera, Henare Roera, Hare Wirikake, Kararaina Whawha and Mereana Patukino.			
39	[horse track]	Railways, roads and tracks	Lot 1 DP 60994, Lot 2 DP 60994, Lot 2 DP 464458, Lot 5 DP 90212, Lot 1 DP 69565, Lot 3 DP 464458,		ML 364, SO 11456		
40	Te Waiaruhe creek	Geology and fauna	Part Lot 14 DP 2463	The 'bracken fern stream', the bracken fern had an edible rhizome and was a staple food in pre-European times.	ML 364, Horizons 2005 DEM		
41	Kohitere clearing	Occupied clearing	Lot 1 DP 29076, Part Section 67 Horowhenua East SETT, Lot 2 DP 427531, Part Lot 3 DP 25093, Lot 1 DP 69127, Lot 2 DP 86751, Part Section 68	A large occupied forest clearing used by Muaūpoko for cultivation and catching pigs. A butchery was located in this clearing.	ML 4903, SO 14541	MLC 25-03-1873, MLC 28-3-1873	

			<p>Horowhenua East SETT, Lot 2 DP 69127, Lot 1 DP 25093, Lot 5 DP 25093, Lot 1 DP 427531, Lot 4 DP 40890, Section 86 Block V Waiopehu SD, Lot 2 DP 25093, Lot 4 DP 25093, Lot 1 DP 55800</p>				
42	Waiore	Geology and fauna		<p>Unknown, possibly an old well. Kawana Hunia te Hakeke described a similarly named place, Waihau, as being a place "where we obtained hinau berries and caught birds. We lived at these places... To Waihau I went to receive the tapu". Paki te Hunga described Waihau as "an artificial well for steeping hinau".</p>	ML 4903		MLC 29-03-1873, AJHR 1898 G-02a

43	Kopi track	Railways, roads and tracks	Part Lot 3 DP 6490, Lot 1 DP 63980, Lot 1 DP 24471	As stated by Manihera te Rau, Kopi is the commencing place and name of a track leading from the Makomako clearing at Lake Horowhenua that leads inland to Ohau and the Tararua Range.	ML 4903		
44	Waimarie stream	Geology and fauna	Part Lot 2 DP 1941, Part Lot 4 DP 1941, Lot 1 DP 514857, Lot 2 DP 422327	A temporary stream that flowed during periods of inundation, the dry bed serving as a walking track leading to clearings the Arapaepae Ridge at other times of the year.			Horowhenua (Adkin, 1948)
45	[house]	Buildings and structures	Part Lot 4 DP 1941	Possible pre-1900 house site, but may also be a shed. Other outbuildings and sheds are located on same property. Tentatively identified as pre-1900 on the basis of the building footprint and an established garden of mature trees.		SN 181	

46	[house]	Buildings and structures	Lot 2 DP 82330	Possible pre-1900 house with some outbuildings or sheds, now used as a packhouse (?). Tentatively identified on the basis of the building footprint and a few mature trees and hedges.		SN 181		
47	[house]	Buildings and structures	Lot 22 DP 2291	Possible pre-1900 house tentatively identified on the basis of the building footprint and mature trees.		SN 181		
48	Te Aratoaka track	Railways, roads and tracks	Lot 2 DP 323615, Lot 25 DP 2291, Lot 1 DP 69491	A track connecting Kawiu clearing, on the north shore of Lake Horowhenua, to the Arapaepae Ridge.	ML 4903			
49	Te Awa a te Tau/Koputaroa stream	Geology and fauna	Part Lot 9 DP 417, Section 1 SO 405188, Part Lot 1 DP 65805, Part Lot 3 DP 447	The upper reaches of the Koputaroa stream also go by the name Te Awa-a-Te Tau, 'the stream of Te Tau', and contain tuna (eel), kēwai (fresh-water crayfish), kākahi (fresh-water mussel). Adkin states that the banks of this stream are of high			Horowhenua (Adkin, 1948)	

				archaeological interest, with "very numerous remains of umu or hāngī... occur along the course of the stream or in its immediate vicinity."				
50	[house]	Buildings and structures	Lot 1 DP 52953	Possible pre-1900 house tentatively identified on the basis of the building footprint.		SN 181		
51	[house]	Buildings and structures	Lot 1 DP 396758	Possible pre-1900 house tentatively identified on the basis of the building footprint.		SN 181		
52	[house]	Buildings and structures	Section 51 Block II Waiopehu SD	Possible pre-1900 house tentatively identified on the basis of the building footprint. Unclear if still standing or demolished and rebuild on top.		SN 181		
53	Waitaiki stream	Geology and fauna	Lot 1 DP 323615, Lot 2 DP 323615, Lot 1 DP 69491, Section 51 Block II Waiopehu SD,	A 'taiki' is a wicker basket, perhaps indicating the manufacture or use of hinaki at or nearby this stream. The name was provided to Adkin by Hori	Horizons 2005 DEM		Horowhenua (Adkin, 1948)	

			Lot 2 DP 396758, Part Lot 1 DP 29766	Wirihana of the Muaūpoko iwi. The stream was also feed by the Punaoho spring that was known as a source of excellent drinking water.			
54	[track to Kaihinau]	Railways, roads and tracks	Lot 2 DP 428802, Lot 2 DP 73153, Lot 1 DP 73153	Approximate location of an early inland walking trail on a roughly northeast-southwest orientation.	ML 4903		
55	Waikarito stream	Geology and fauna	Lot 1 DP 73153	The 'raupo (karito) stream', raupo was used in a number of ways by Māori including as a thatching material and as a fibre for clothing.			Horowhenua (Adkin, 1948)
56	Wellington-Manawatu Railway (NIMT)	Railways, roads and tracks		The Wellington-Manawatu Railway provided the main commercial and public transport link between Wellington and Palmerston North and the inland settlements between them. The line was completed in 1886.	PWD 8555		Railways of New Zealand (Leitch, 1972)

57	Heatherlea' Native Reserve (Manawatu Kukutauaki Block No. 7D3A)	Native Reserves	Lot 1 DP 319993, Lot 1 DP 19771, Lot 2 DP 410379, Lot 1 DP 410379, Lot 3 DP 410379, Lot 4 DP 19771, Lot 3 DP 19771, Part Lot 8 DP 4291, Lot 1 DP 305662, Lot 1 DP 40660, Lot 2 DP 40660, Part Lot 6 DP 4291, Lot 1 DP 22733, Part Lot 5 DP 4291, Lot 1 DP 14380, Lot 2 DP 14380, Lot 3 DP 14380, Lot 4 DP 14380, Part Lot 5 DP 14380, Part Lot 5 DP 14380, Lot 6 DP 14380	Land retained as a native reserve following breakup of the Manawatu Kukutauaki 7D Block. Although forested until relatively, approximately half of the land to the south of Heatherlea East Road was cleared prior to 1900. Full records regarding ownership were not able to be located.	DP 391		
58	[house]	Buildings and structures	Lot 1 DP 396990	Possible pre-1900 house site tentatively identified on		SN 181	

				the basis of the building footprint and mature trees.				
59	Waituhi snaring tree	Geology and fauna	Lot 1 DP 18535, Lot 1 DP 89441	A bird snaring location on a small knoll or rise on the west side of and close to the Heatherlea-Koputaroa intersection.			Horowhenua (Adkin, 1948)	

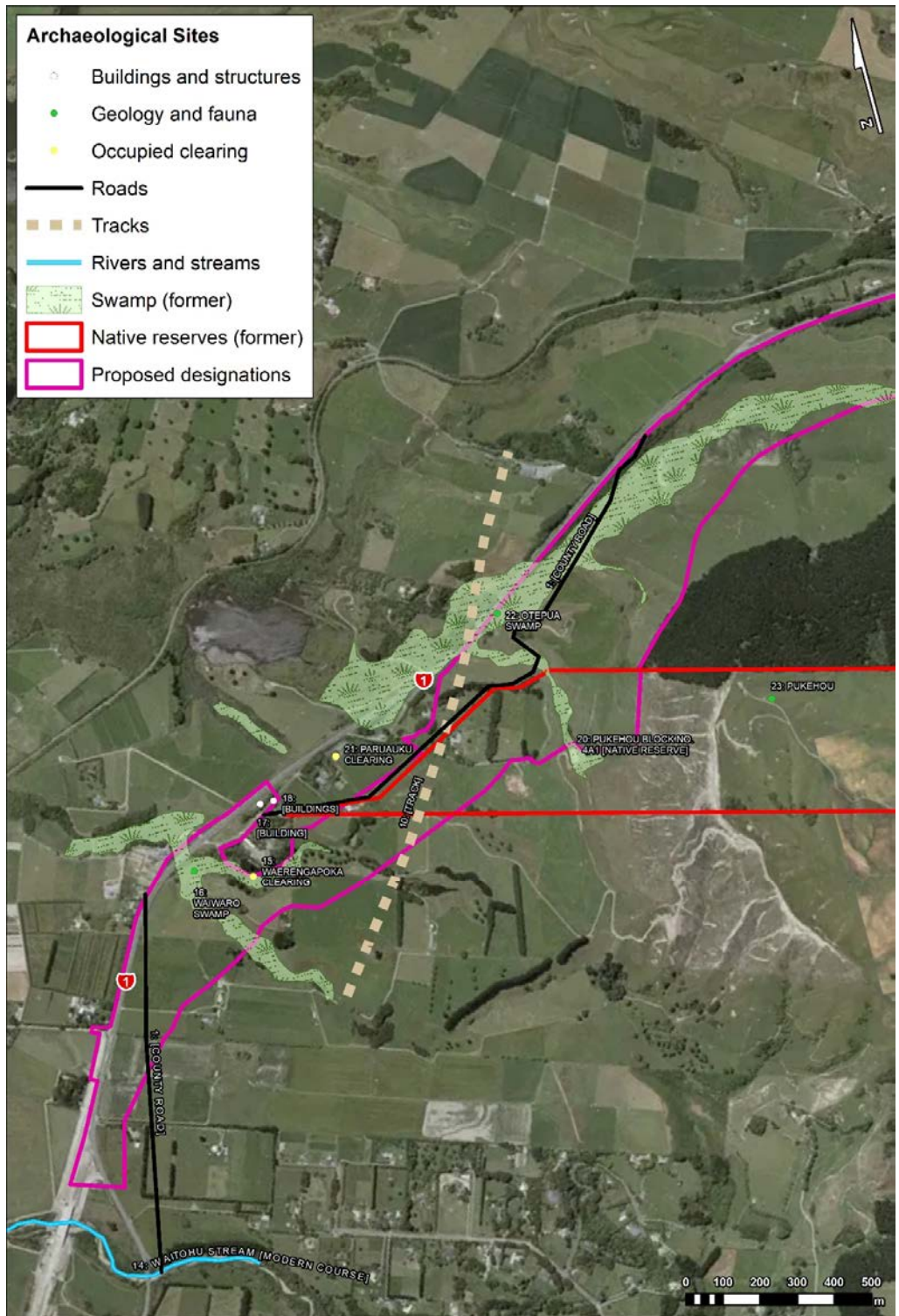


Figure L.6 Archaeological sites (verified and potential) within or in close proximity to the proposed designations to the north of Ōtaki.

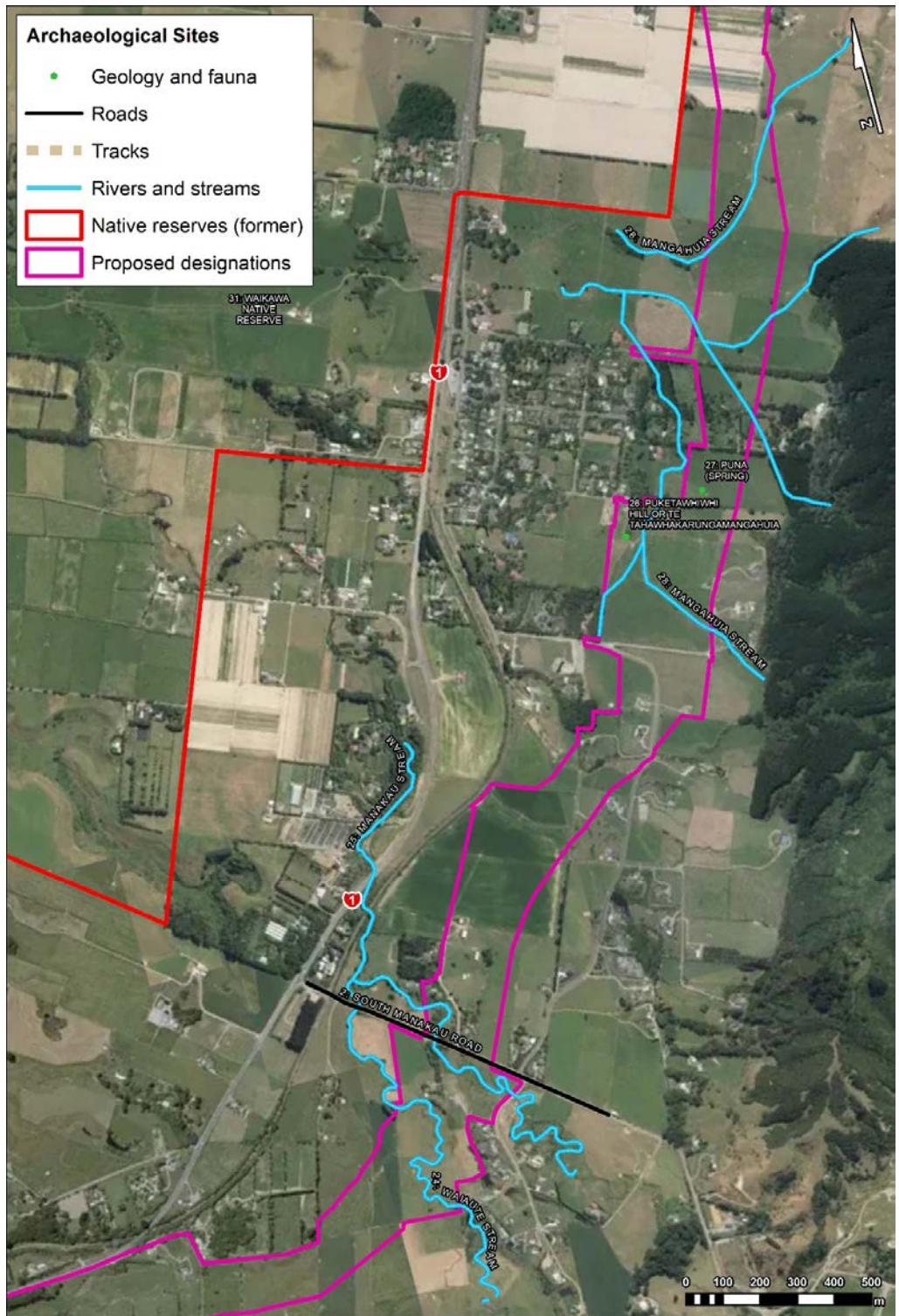


Figure L.7 Archaeological sites (verified and potential) within or in close proximity to the proposed designations to the south of Manakau.

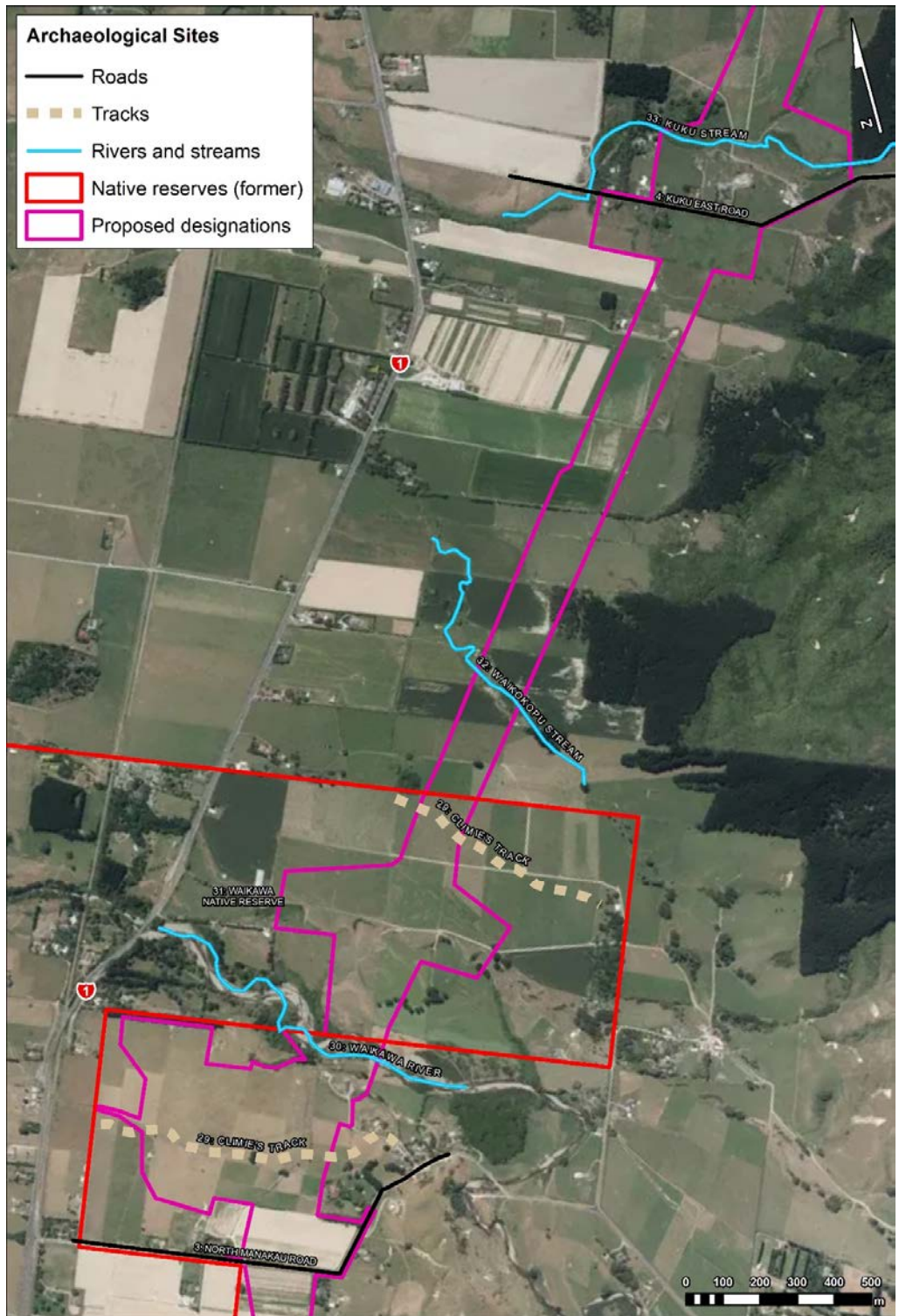


Figure L.8 Archaeological sites (verified and potential) within or in close proximity to the proposed designations to the north of Manakau.

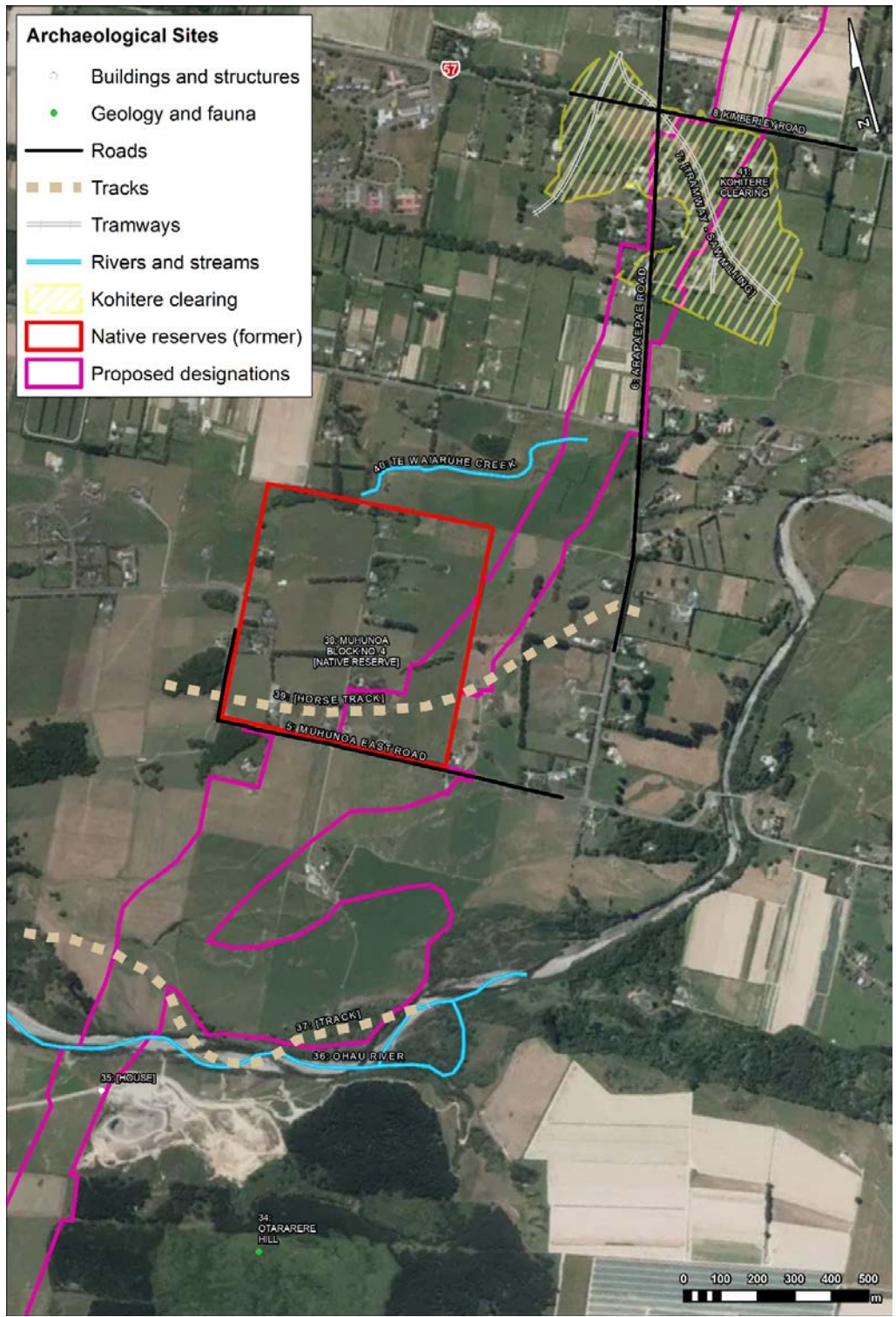


Figure L.9 Archaeological sites (verified and potential) within or in close proximity to the proposed designations to the east of Ohau.

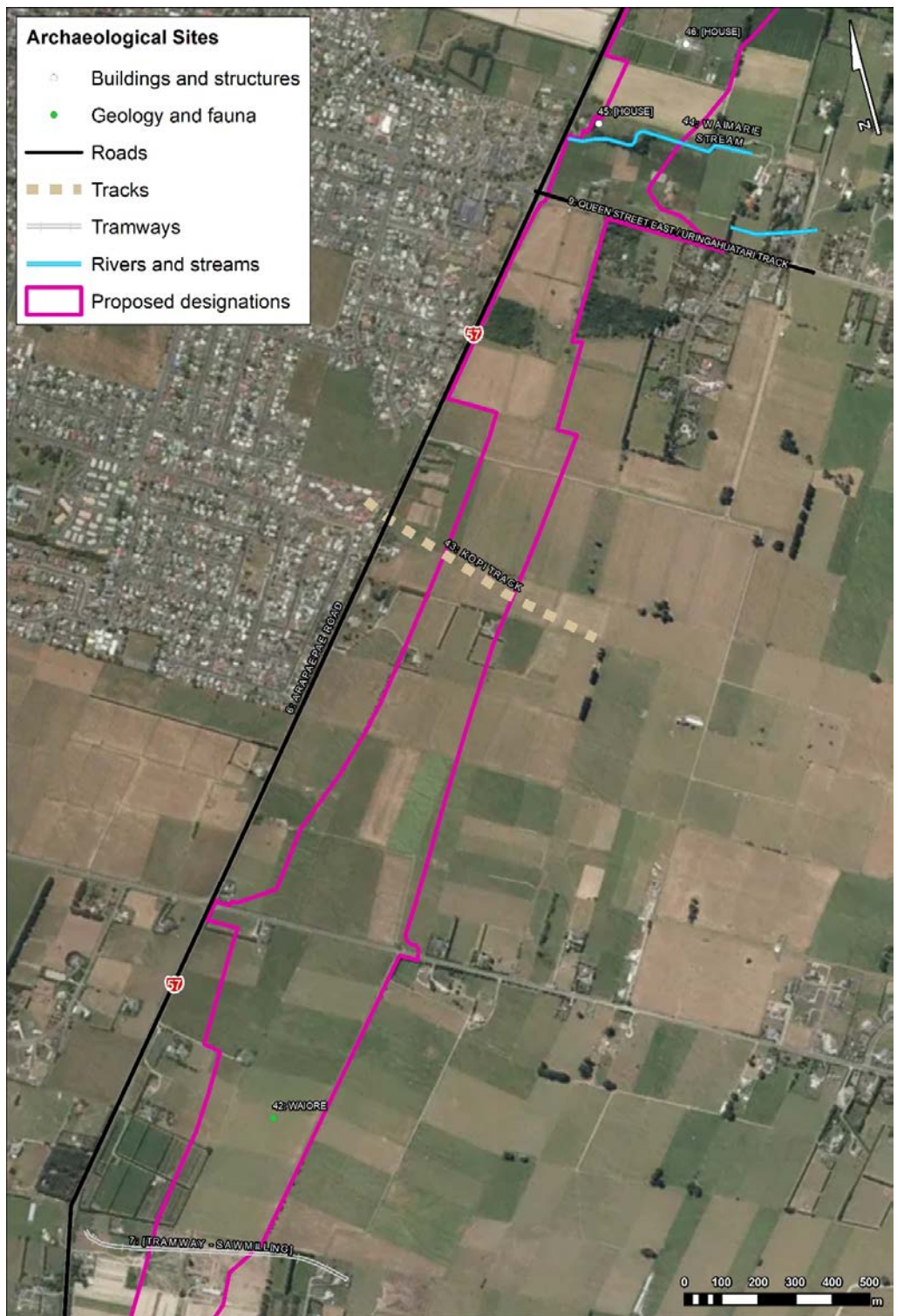


Figure L.10 Archaeological sites (verified and potential) within or in close proximity to the proposed designations to the southeast of Levin.

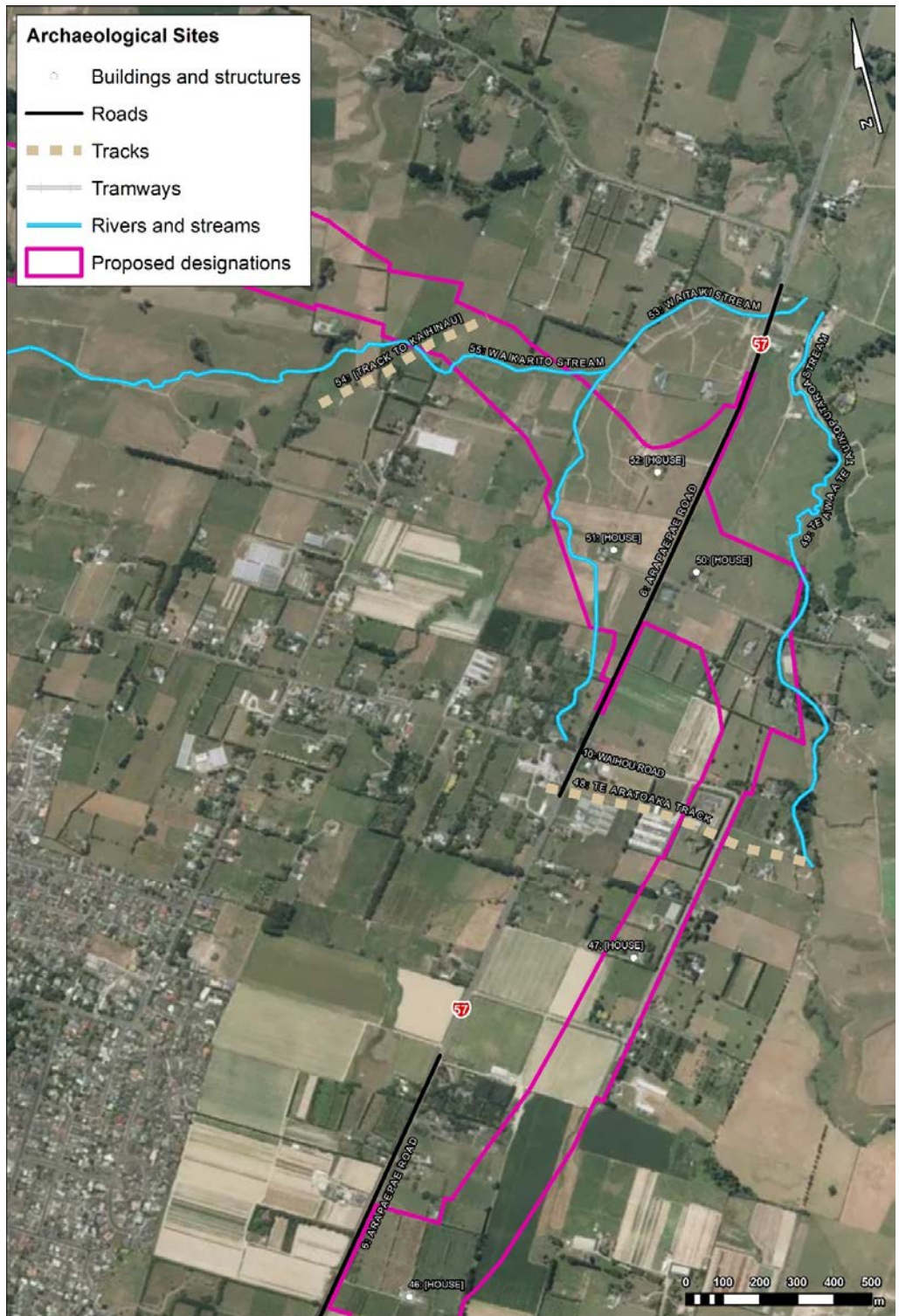


Figure L.11 Archaeological sites (verified and potential) within or in close proximity to the proposed designations to the northeast of Levin.

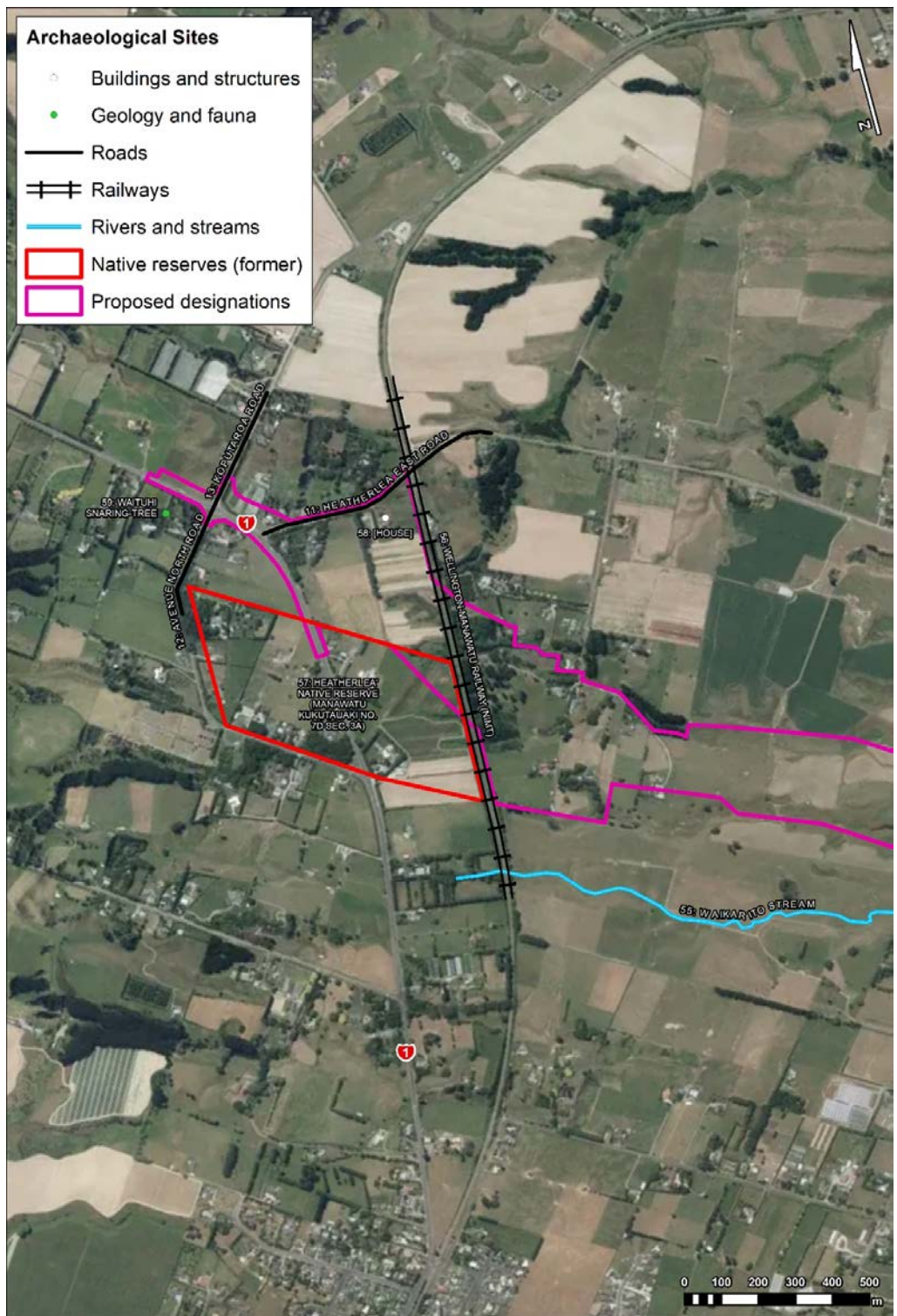


Figure L.12 Archaeological sites (verified and potential) within or in close proximity to the proposed designations to the north of Levin.

APPENDIX L.2: HNZPT ARCHAEOLOGICAL VALUES ASSESSMENT

CRITERIA

1. *"Archaeological values relate to the potential of a place to provide evidence of the history of New Zealand. This potential is framed within the existing body of archaeological knowledge, and current research questions and hypotheses about New Zealand's past. An understanding of the overall archaeological resource is therefore required."* NZHPT 2006
2. Following Gumbley (1995) and Walton (2002),¹³ archaeological values can be divided into two contextual categories. The first looks at the intra-site context and evaluates a site as a distinct and discrete entity.

Condition

3. How complete is the site? Have parts of the site been damaged or destroyed? A complete and undamaged site has a high value, a partially destroyed or damaged site has a moderate value and a site which has suffered significant damage or destruction will have a low value.

Rarity/uniqueness

4. Rarity is classified into local, regional and national contexts. Sites that are rare at a local level only are afforded a low significance, those that are rare at a regional level are given a moderate value, and sites that are rare nationwide are held to have a high significance. Sites that are not rare at any of these spatial levels have no significance in this category.

Information potential

5. Does the site have the potential to contribute to the expansion of human knowledge about our past? For sites where the expected feature set is predicted to support questions of a purely local interest the information potential is low. Where the archaeology may contribute to the resolution of questions of a national interest level the potential is considered to be moderate. The highest level of information potential is reserved for those sites that may be able to contribute information to research themes that are of a global interest.
6. The second set of archaeological values relate to the inter-site contexts that evaluate individually distinct and discrete sites as subsets of a great whole.

¹³ The Gumbley and Walton articles are cited as items for further reading in the HNZPT document *Archaeological Guidelines Series No. 2: Writing Archaeological Assessments*.

Archaeological landscape/contextual value

7. What is the context of the site within the surrounding archaeological landscape? Does the site derive all or part of its meaning from, or impart meaning to, other sites within the wider landscape? If a site is one of many amongst other sites of a similar nature the contextual value is low. Where a site imparts additional meaning to, or derives additional meaning from, one or more other sites by virtual or landscape, structural, historic, cultural or other relationships the contextual value of those sites is collectively high.

Amenity value

8. Amenity value is a synthesis of the above criteria framed as a measure of a sites potential to reach beyond a purely scientific audience and communicate its multiplicity of values to a wider public audience. This measure particularly favours dominant sites that define the context of the wider landscape, and those with visible surface features in a good condition of preservation, with high values. Sites that derive their value through their relationship to more dominant sites, and those with little or no visible surface features, will have a low amenity value.

Cultural association

9. How are the past and the present connected through the relationship of the historic site to the people of the present, be they tangata whenua, other descendant groups or the general public? The highest values are afforded to sites that are the nexus of a direct relationship between important historic events and the social memory of the descendants who played out those events. Moderate values more generally apply to sites where one part of this relationship, important historic events or social memory, is retained. Where neither aspect of to this relationship are found a low value is applied.
10. Other values can also include (NZHPT, 2004):
 - (a) Architectural
 - (b) Historic
 - (c) Scientific
 - (d) Technological
 - (e) Aesthetic/Visual impact
 - (f) Cultural

References

Gumbley, W. (1995). 'Guidelines for the provision of archaeological information and assessment for authority applications under section 11 or 12 of the Historic Places Act 1993'. *Archaeology in New Zealand* 38(2): 100-105.

New Zealand Historic Places Trust (NZHPT) (2004). *Heritage Management Guidelines for Resource Management Practitioners* Retrieved from http://www.historic.org.nz/publications/HM_guidelines.html

New Zealand Historic Places Trust (NZHPT) (2006). *Archaeological Guidelines Series No. 2: Guidelines for Writing Archaeological Assessments* Retrieved from http://www.historic.org.nz/ProtectingOurHeritage/Archaeology/Arch_Guidelines.aspx#assessment

Walton, T. (2002). Assessing archaeological value. *Archaeology in New Zealand*, 45(3), 220-236.

APPENDIX L.3: ASSESSMENT OF ARCHAEOLOGICAL VALUES AND EFFECTS

Table L.4 Assessment of indicative archaeological values of verified archaeological sites within the proposed designations of the Ō2NL Project.

Site ID	Site Name	Indicative Archaeological Values						TOTAL VALUE	Archaeological potential	Predicted mitigated effect	Comment on values, potential and effects
		Rarity/Unique-ness	Information potential	Contextual value	Amenity value	Cultural associations	Historic				
1	[county road]	0	1	1	0	1	0	3	Verified	Negligible	Part of the former county road that is now known as SH1. It is a low value site and large sections of the former road alignment remain unaffected by the Ō2NL Project.
2	South Manakau Road	0	1	1	1	1	0	4	Verified	Negligible	A low value site and large sections of the road remain unaffected by the Ō2NL Project resulting in a negligible effect.

3	North Manakau Road	0	1	1	1	1	0	4	Verified	Negligible	A low value site and large sections of the road remain unaffected by the Ō2NL Project resulting in a negligible effect.
4	Kuku East Road	0	1	1	1	1	0	4	Verified	Negligible	A low value site and large sections of the road remain unaffected by the Ō2NL Project resulting in a negligible effect.
5	Muhunoa East Road	0	1	1	1	1	0	4	Verified	Negligible	A low value site and large sections of the road remain unaffected by the Ō2NL Project resulting in a negligible effect.
6	Arapaepae Road	0	1	1	1	1	0	4	Verified	Negligible	A low value site and large sections of the road remain unaffected by the Ō2NL Project

											resulting in a negligible effect.
7	[tramway – sawmilling]	2	1	2	0	1	1	7	Verified	Negligible	A recent geophysical survey (Parker and Bader, 2020) has identified the remains of a 19 th century sawmillers tramway. Nails/spike and other inorganic items are expected to be the only surviving materials, Excavation and documentation is expected to result in a no more than minor effect.
8	Kimberley Road	0	1	1	1	1	0	4	Verified	Negligible	A low value site and large sections of the road remain unaffected by the Ō2NL Project resulting in a negligible effect.

9	Queen Street East / Uringahuarari track	0	1	1	1	1	0	4	Verified	Negligible	A low value site and large sections of the road remain unaffected by the Ō2NL Project resulting in a negligible effect.
10	Waihou Road	0	1	1	1	1	0	4	Verified	Negligible	A low value site and large sections of the road remain unaffected by the Ō2NL Project resulting in a negligible effect.
11	Heatherlea East Road	0	1	1	1	1	0	4	Verified	Negligible	A low value site and large sections of the road remain unaffected by the Ō2NL Project resulting in a negligible effect.
12	Avenue North Road	0	1	1	1	1	0	4	Verified	Negligible	A low value site and large sections of the road remain unaffected by the Ō2NL Project

											resulting in a negligible effect.
13	Koputaroa Road	0	1	1	1	1	0	4	Verified	Negligible	A low value site and large sections of the road remain unaffected by the Ō2NL Project resulting in a negligible effect.

Table L.5 Assessment of indicative archaeological values of potential archaeological sites within or in close proximity to the proposed designations of the Ō2NL Project.

Indicative Archaeological Values											
Site ID	Site Name	Rarity/ Uniq- ueness	Informat ion potential	Contextual value	Amenity value	Cultural associat ions	Historic	TOTAL VALUE	Archaeol ogical potential	Predicted mitigated effect	Comment on values, potential and effects
14	Waitohu stream	1	1	2	2	2	0	8	Minor	Negligible	The Waitohu stream and its banks have been occupied by Māori for many centuries. Any archaeological sites that are found here will be excavated and documented, but the Ō2NL Project's effects in this area are likely to be negligible following on from the effects of the PP2Ō project in the same area.

15	Waerenga poka clearing	2	2	2	0	2	1	9	Minor	Negligible	The exact location and extent of this former clearing at the base of Pukehou is unknown but a recent geophysical survey (Parker and Bader, 2020) indicates it is unlikely to be affected by the Ō2NL Project.
16	Waiwaro swamp	1	1	2	2	2	0	8	Moderate	Minor	Moderate archaeological potential reflects a recent geophysical survey (Parker and Bader, 2020) that identified the probable remains of two Māori hunting camps on the banks of the upper reaches of this swamp. Additional sites may be expected in this area, but excavation and documentation is expected to result

											in a no more than minor effect.
17	[building site]	1	1	1	0	1	0	4	Moderate	Negligible	This building is identified in a 19th century public works plan, but may have been destroyed by prior earthworks for the construction of the existing SH1. Any surviving material remains are located in an area that will undergo minor modification and therefore any effect is expected to be negligible.
18	[building site]	1	1	1	0	1	0	4	Moderate	Negligible	Two buildings are identified in a 19th century public works plan and may have been adversely affected by prior episodes of road construction. Any

											surviving material remains are located in an area that will undergo minor modification and therefore any effect is expected to be negligible.
19	[track]	2	1	1	0	1	1	6	Minor	Minor	The higher value for this track reflects its status and an important inland trail for access to northern and southern regions. There is a minor possibility that physical traces of the track have survived, but archaeological materials associated with activity along the track could be encountered. Excavation and documentation of any sites will result

											in a no more than minor effect.
20	Pukehou Block No. 4A1	2	1	1	0	2	0	6	Minor	Minor	A recent geophysical survey (Parker and Bader, 2020) over most of the land that will be affected in this former Native Reserve indicates that archaeological sites are unlikely to be affected here. Two areas of magnetic disturbance were identified that could be associated with archaeological remains or modern horticultural activities. Any archaeological sites that may be found here would be excavated and documented, resulting in a no

											more than minor effect.
21	Paruauku clearing	2	2	2	0	2	1	9	Minor	Negligible	The exact location and extent of this former clearing at the base of Pukehou is unknown but a recent geophysical survey (Parker and Bader, 2020) indicates it is unlikely to be affected by the Ō2NL Project. The high values reflect its importance as a focal point of mid-19th century settlement by various hapu or affiliates of Ngati Raukawa, but the Ō2NL Project's effect is expected to negligible.

22	Otepua swamp	1	1	2	2	2	0	8	Moderate	Minor	No archaeological materials were identified in the vicinity of this swamp during a recent geophysical survey (Parker and Bader, 2020). However, given the extent of works through this swamp and survey results at Waiwaro (above), there is a moderate possibility that archaeological sites could be encountered in parts of the swamp outside the surveyed areas. Excavation and documentation is expected to result in a no more than minor effect.
23	Pukehou	2	2	3	3	3	2	15	Minor	Negligible	Native Land Court records indicate that high value/sensitive sites associated with

											settlements and urupā are located in the general Pukehou area, hence the high value. A recent geophysical survey (Parker and Bader, 2020) did not detect any signs of this activity in the O2NL Project area. However, there is a residual possibility that archaeological materials peripherally associated with these sites could be encountered, but the potential is minor and any effect is expected to be negligible.
24	Waiaute stream	3	3	2	2	2	2	14	Low	Moderate	The name given to this stream indicates there is the potential for high value sites, possibly associated with Polynesian

											plant imports, to be encountered in this area. Any archaeological sites that may be found here would be excavated and documented, but this would not fully mitigate for the loss of a potentially rare and important site. A moderate residual level of effect would be expected here.
25	Manakau stream	1	1	2	2	2	1	9	Minor	Minor	Māori have occupied the landscape along the Manakau Stream for many centuries, though historic occupation was generally concentrated on the lower reaches beyond the Ō2NL Project's extent. Excavation and documentation of any archaeological

											materials uncovered here will result in a no more than minor effect.
26	Puketawhi whi/Te Tahawhak arungama ngahuia hill	1	1	2	1	2	0	7	Minor	Negligible	This hill falls within the Ō2NL Project's designation extent but is not within the main construction footprint. There is a minor potential that archaeological materials will be encountered here and there may be scope to avoid or minimise effects to a negligible level.
27	Puna (spring)	1	1	1	2	2	1	8	Low	Minor	Mid-level values reflect the fact that springs are often considered to be tapu; springs in the vicinity of Manakau have been used as repositories for important artefacts. There is a low

											potential for archaeological sites to be encountered here. Excavation and documentation of any materials uncovered is expected to result in a no more than minor effect.
28	Mangahui a stream	1	1	2	2	2	0	8	Low	Minor	Mid-level values reflect the potential importance of the Mangahuaia as a hunting ground for the highly prized and now extinct huia bird. Soil conditions along the stream are generally swampy/damp along the Ō2NL Project's alignment, so a low archaeological potential is expected. Excavation and documentation of any archaeological

											material that may be encountered is expected to result in a no more than minor effect.
29	Climie's track	2	1	1	0	1	0	5	Minor	Minor	There is a minor possibility that physical traces of the track have survived, but archaeological materials associated with activity along the track could be encountered. Excavation and documentation of any sites will result in a no more than minor effect.
30	Waikawa River	1	1	2	2	2	0	8	Low	Minor	The Waikawa stream and its banks have been occupied by Māori for many centuries, though historic occupation was generally concentrated on the

											lower reaches beyond the Ō2NL Project's extent. Any archaeological sites that are found here will be excavated and documented, resulting in a no more than minor effect.
31	Waikawa Native Reserve	2	1	1	0	2	0	6	Negligible	Negligible	Only a very small portion of this former native reserve is affected by the Ō2NL Project and the land was mostly forested until the late 19th century. Archaeological sites that may be encountered are more likely to be associated with other listed sites (Waikawa River and Climie's track). A

											negligible effect is expected.
32	Waikokopu stream	1	1	2	2	2	0	8	Minor	Minor	The kōkopu is a freshwater fish that were caught and eaten by Māori. The stream and its banks have been occupied for many centuries, though historic Māori occupation was generally concentrated on the lower reaches beyond the Ō2NL Project's extent. Any archaeological sites that are found here will be excavated and documented, resulting in a no more than minor effect.

33	Kuku stream	1	1	2	2	2	1	9	Minor	Low	The Kuku stream and its banks have been occupied by Māori for many centuries, though historic occupation was generally concentrated on the lower reaches beyond the Ō2NL Project's extent. The slightly higher value and expect effect reflects the possibility that human remains (associated with a battle that may have passed through this area) could be encountered. Any archaeological sites that are found here will be excavated and documented, resulting in a no more than low effect.
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34	Otararere hill	1	1	1	1	1	0	5	Minor	Negligible	The lower face and terraces of Otatarere hill are within the designation extent but will not be affected by the Ō2NL Project's alignment. Archaeological sites are more likely to be located on the ridgelines or peaks of the hill outside the designation extent, but a minor archaeological potential remains. There is likely to be scope to avoid or minimise effects to a negligible level.
35	[house site]	1	1	1	0	1	0	4	Low	Negligible	There is minimal information indicating an early age for this house; a few established trees visible in the 1942 aerial photograph being

											the main evidence. The site of this house has been adversely affected by prior earthworks (drainage ditch and quarry road), meaning any additional effects to archaeological materials are likely to be negligible.
36	Ōhau River	1	1	2	2	2	0	8	Low	Minor	The Ōhau River and its banks have been occupied by Māori for many centuries, though historic occupation was generally concentrated on the lower reaches beyond the Ō2NL Project's extent. Archaeological potential is slightly higher than for other rivers and streams as important trails accessing inland

											cultivation grounds and paths crossing over to the Wairarapa passed along the riverbanks. Any archaeological sites that are found here will be excavated and documented, resulting in a no more than minor effect.
37	[track]	2	1	1	0	1	0	5	Minor	Minor	There is a minor possibility that physical traces of the track have survived, but archaeological materials associated with activity along the track could be encountered. Excavation and documentation of any sites will result in a no more than minor effect.

38	Muhunoa Block No. 4	2	1	1	0	2	0	6	Minor	Negligible	The Ō2NL Project's designation extent covers approximately 1/5 of the former native reserve. The reserve was cleared of its forest prior to 1888, but there is no evidence for of residential activity at this site. A negligible effect is expected.
39	[horse track]	2	1	1	0	1	0	5	Minor	Minor	There is a minor possibility that physical traces of the track have survived, but archaeological materials associated with activity along the track could be encountered. Excavation and documentation of any sites will result

											in a no more than minor effect.
40	Te Waiaruhe creek	1	1	2	2	2	0	8	Low	Minor	The possibility that archaeological sites may be encountered here is indicated by the stream's name association with fern root, a staple food of the local Māori diet. Only a small area at the head of the gully will be affected by the Ō2NL Project, resulting in a low level of archaeological potential. Excavation and documentation of any archaeological materials will result in a no more than minor effect.
41	Kohitere clearing	2	2	2	0	2	1	9	Minor	Low	Ground testing of recent geophysical survey results

												(Parker and Bader, 2020) indicate that archaeological remains associated with Muaūpoko occupation are unlikely to be found here.
42	Waiore	3	1	1	0	1	0	6	Low	Low	The location for this site is derived from a 19th century sketch plan known to have a low level of spatial accuracy. There is a low level possibility the site will be affected by the Ō2NL Project, but the high rarity of this site means any effect would be more than minor.	
43	Kopi track	2	1	1	0	1	0	5	Minor	Minor	There is a minor possibility that physical traces of the track have survived, but archaeological	

											materials associated with activity along the track could be encountered. Excavation and documentation of any sites will result in a no more than minor effect.
44	Waimarie stream	1	1	1	0	1	0	4	Minor	Minor	An ephemeral stream also used as a walking track during dry seasons. Archaeological materials associated with its use as a trail could be encountered. Excavation and documentation of any sites will result in a no more than minor effect.
45	[house site]	1	1	1	0	1	0	4	Moderate	Negligible	Out-buildings for this possible 19th century house are located inside the Ō2NL Project's

												designation extent and one within the alignment's footprint. There is likely to be scope to avoid or minimise most effects to a negligible level.
46	[house]	1	1	1	1	1	0	5	Low	Minor	A possible 19th century house. Excavation and documentation of any archaeological materials will result in a no more than minor effect.	
47	Waitaiki stream	1	1	2	2	2	0	8	Low	Minor	The name given to this stream suggests there is the potential for basket making activity or use (i.e., hinaki) to have occurred in this area. Excavation and documentation of any archaeological materials that are	

											encountered will result in a no more than minor effect.
48	[house site]	1	1	1	0	1	0	4	Low	Minor	The style and development of gardens at this former house site suggest there is only a low level possibility that it is a 19th century house site. Excavation and documentation of any archaeological materials will result in a no more than minor effect.
49	Te Aratoaka track	2	1	1	0	2	1	7	Minor	Minor	The higher value for this track reflects its status as a named track and important trail from Lake Horowhenua (Kawiu Clearing) to the Tararuas. There is a minor possibility that physical traces of

											the track have survived, but archaeological materials associated with activity along the track could be encountered. Excavation and documentation of any sites will result in a no more than minor effect.
50	Te Awa a te Tau/Koputaroa stream	1	2	2	2	2	0	9	Moderate	Minor	Native Land Court records and Adkin (1948) note the presence or potential presence of archaeological sites along the banks of the Koputaroa stream or in its general vicinity, including midden and cultivated clearings. Excavation and documentation of any midden sites will result in a no more

												than minor effect. The adverse effect will be greater if a cultivated clearing is encountered, but there is a lower probability of this occurring.
51	[house]	1	1	1	1	1	0	5	Low	Minor	The style and development of gardens at this former house site suggest there is only a low level possibility that it is a 19th century house site. Excavation and documentation of any archaeological materials will result in a no more than minor effect.	
52	[house]	1	1	1	1	1	0	5	Low	Minor	The style and development of gardens at this former house site suggest there is only a low level possibility	

												that it is a 19th century house site. Excavation and documentation of any archaeological materials will result in a no more than minor effect.
53	[house]	1	1	1	1	1	0	5	Low	Minor		The style and development of gardens at this former house site suggest there is only a low level possibility that it is a 19th century house site. Excavation and documentation of any archaeological materials will result in a no more than minor effect.
54	[track to Kaihinau]	2	1	1	0	1	1	6	Minor	Minor		The higher value for this track reflects its status and an important inland trail for access to northern and

											<p>southern regions. There is a minor possibility that physical traces of the track have survived, but archaeological materials associated with activity along the track could be encountered. Excavation and documentation of any sites will result in a no more than minor effect.</p>
55	<i>Waikarito stream</i>	1	1	2	2	2	0	8	<i>Low</i>	<i>Minor</i>	<p>There are no known settlements or occupation sites on the Waikarito stream, though the name suggests this site may have been visited to collect thatching and fibre materials. Excavated and documentation of any archaeological</p>

											materials uncovered here will result in a no more than minor effect.
56	Wellington - Manawatu Railway (NIMT)	1	2	2	1	2	2	10	Minor	Minor	High values reflect the importance of the development of the Wellington-Manawatu Railway in the transport and economic history of New Zealand. However, due to centuries of repair and maintenance the railway line should no longer be considered an archaeological site, but there is minor potential for archaeological sites associated with the railways 19th century construction to be encountered (workers camps etc). Excavation and documentation of

											any sites will result in a no more than minor effect.
57	[house]	1	1	1	1	1	0	5	Moderate	Negligible	An established garden with mature trees in 1942 suggests there is a higher probability of this house having been constructed prior to 1900. Located on the edge of the Ō2NL Project's designation extent, this house will not be physically affected and therefore the effect is expected to be negligible.
58	Heatherlea ' Native Reserve (Manawatu Kukutauak	2	1	1	0	2	0	6	Negligible	Negligible	Only a very small portion of this former native reserve is affected by the Ō2NL Project and the land was forested until the late

	i Block No. 7D3A)										19th century. Archaeological sites are not expected to be encountered and negligible effect is expected.
59	Waituhi snaring tree	2	1	1	0	1	0	5	Minor	Negligible	Records indicate that this site is likely located outside the designation extent and will not be affected, but archaeological potential is given as minor to allow for a margin of error in the site location. The Ō2NL Project's effect is expected to be negligible.

APPENDIX L.4: POTENTIAL ARCHAEOLOGICAL SITES

1. The following provides a discussion of the potential archaeological sites located within or in close (but uncertain) proximity to the proposed designations as shown in **Figure L.6**. It is followed by a provisional assessment of the O2NL Project's potential adverse effects and their mitigation. Sites of moderate archaeological potential are treated separately as these are the potential sites where archaeological remains are more likely to be found.

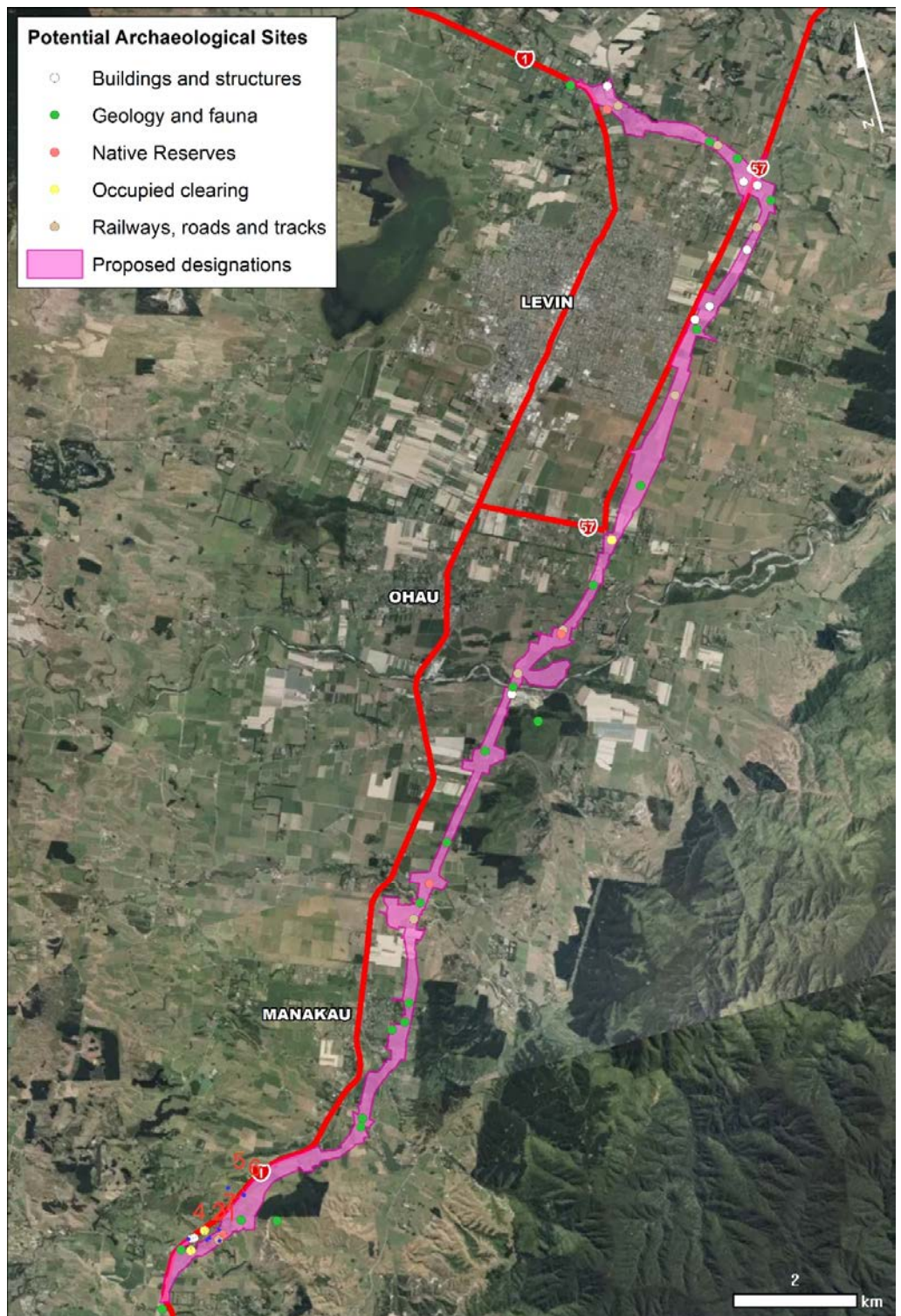


Figure L.13 Locations of potential archaeological sites within the proposed designations. Points offset from the proposed designations are large hills that extend into the margins of the proposed designations.

Moderate potential archaeological sites

- Four 'buildings and structures' fall into the moderate site potential category, most being subsurface archaeological sites unconnected to important local

historic personages and which have a low total heritage value. Two sites (#17 and #18) are known to pre-date 1900 but are located in an area where any physical remains may have been destroyed or badly damaged by prior episodes of road construction for SH1.

3. Three 'geology and fauna' sites are identified as having a moderate site potential. Two of these, the Waiwaro (#16) and Otepua (#22) swamps, are classed on the basis of the results of a recent geophysical survey (Parker and Bader, 2020: 11-16). Evidence for archaeological cooking fires was detected at 3 locations on the upper reaches of gullies draining into the Waiwaro swamp. Though similar features were not identified in parts of the Otepua swamp that were included in the survey, there is a moderate potential that archaeological sites will be found in areas of the swamp that were not included in the survey.
4. The Awa a te Tau, or Koputaroa stream (site #50), was also assigned a moderate archaeological potential. Adkin (1948: 144) recorded that the "*very numerous remains of umu or hāngī (hot-stone ovens, now seen as circular clusters of burnt stones sunk in the soil) occur along the course of the stream or in its immediate vicinity*". Additionally, Māori Land Court minutes for the partition of the Horowhenua Block No. 3 document a dispute referring to a possible cultivated clearing in the vicinity of the Koputaroa stream.
5. Medium total heritage values for the 'geology and fauna' sites reflects strong cultural association and amenity value of these places to local iwi who continue to use these resources.

Low, minor and negligible potential archaeological sites

6. Thirty-nine sites were identified with less than moderate archaeological potential and 18 of these are in the 'geology and fauna' category of sites, being 14 rivers, streams, springs and wells; 3 landmarks; and 1 hunting site.
7. Archaeological potential for waterbodies was generally assessed as being low. This reflects the fact that although historic and contemporary sources indicate that archaeological sites are known to be, or are highly likely to be, located on the banks or in the vicinity of waterbodies, the Ō2NL Project will only affect a small portion of these waterbodies and no specific sites are known in these areas at present. The archaeological potential is assessed to be minor where documentary evidence indicated that historic occupation was concentrated outside of the proposed designations, usually to the west of the existing SH1.

8. Total archaeological values for waterbodies were generally in the medium range (5-10), though the Waiaute stream (site #24) was assessed as having a high total value due to its potentially nationally significant associations with an imported Polynesian cultivar.
9. Puketawhiwhi (site #26), also known as Tahawhakarungamangahuia, and Otararere (site #34) are two hills that are marginally within the proposed designations and there is a minor possibility that archaeological sites will be encountered here.
10. Pukehou is an important local landmark that was the location of a number of important historic events, battles and occupations which are reflected in the high overall heritage value. Testimony given during hearings for the Pukehou blocks in the Māori Land Court indicated there was the potential for a short-lived Ngāti Kauwhata settlement and urupā to be found in this area. However, the recent geophysical survey (Parker and Bader, 2020) along the southern extent of the Ō2NL Project's indicates that settlement or urupā sites are unlikely to be present in the proposed designations, therefore Pukehou is assessed to have only a minor archaeological potential.
11. The Waituhi snaring tree (site #59) location is associated with bird hunting and sources indicate they are located outside of the proposed designations. Due to the relatively close proximity indicated by the sources, the site is included and assigned a minor archaeological potential to allow for a margin of error in their documented locations.
12. Of the 19 remaining sites with less than moderate but greater than negligible archaeological potential, there are 8 'railway, road and track' sites, 6 'buildings and structures' sites, 3 'occupied clearings' and 2 'native reserves' as shown in **Figure L.6**.
13. The 8 'railway, road and track' sites are assessed as having a minor archaeological potential, seven being Māori or surveyor's tracks through the former forest and the eighth being the Wellington-Manawatū Railway (now part of the NIMT). While physical evidence for ancient Māori tracks and trails has survived in some rare instances (e.g., Guthrie-Smith, 1926: 60), archaeological materials associated with activities occurring along these tracks are more likely to be encountered, though this still remains only a minor possibility.
14. Although the Wellington-Manawatū Railway (site #56) was constructed during the 19th century, the physical line, through a continual process of

maintenance and upgrade cannot be considered an archaeological site. However, there is minor potential for archaeological materials or work sites associated with the railway construction to be encountered.

15. Six 'buildings and structures' sites are assessed as having a low archaeological potential, all of which are houses; 2 being subsurface house sites. All of these houses were first identified in a 1942 aerial coverage, though the curtilage settings for at this time (particularly the absence of a developed, mature garden) suggested these may date to the early 20th century. A formal assessment of their potential heritage values by built heritage expert, Ian Bowman, has not been possible at this time and they are included here as a precaution.
16. Three occupied clearings and two native reserves are the final sites with minor archaeological potential. The Waerengapoka (site #15) and Paruauku (site #21) clearings, are known to have been located in the general vicinity of the Ō2NL Project near Pukehou; the Kohitere clearing (site #41), south of Levin, was partially surveyed in the 1890s and the Ō2NL Project passes through this clearing. However, the geophysical survey and recent ground-testing of magnetic anomalies did not identify any material evidence for an occupied or cultivated clearing at these locations. The archaeological potential in respect of these sites is minor.
17. Pukehou Block No. 4A1 (site #20) and Muhunua Block No. 4 (site #38) are former native reserves that will be affected by the Ō2NL Project. The recent geophysical survey (Parker and Bader, 2020: 15) did not detect any definitive remains of archaeological sites in Pukehou Block No. 4A1, but magnetic anomalies that could be of archaeological or modern horticultural origin were detected. The Muhunua Block No. 4 was not included in the geophysical survey, but historic survey plans indicate this land had been cleared of its former forest by 1888 and was sold to John Kebble in 1892. Kebble lived outside of the block and there is no evidence for any other settlement or established occupation in this reserve. However, due to the inconclusive geophysical data at Pukehou and the early forest clearance at Muhunua, both native reserves are assigned a minor archaeological potential as a precaution.
18. Two other native reserves are included in the Ō2NL Project's proposed designation extent, these being parts of Waikawa Native Reserve (site #31) and, 'Heatherlea' Native Reserve (site #58). Their archaeological potential is negligible, both having been heavily forested until the late 19th century and

being located to the east of the main centres of Māori settlement¹⁴ prior to and during the 19th century.

Potential effects on sites of moderate archaeological potential

19. Potential effects on sites of moderate archaeological potential are generally expected to be negligible or minor, with two sites possibly rising to the level of a low effect. 'Buildings and structure' sites #17, #18, #45 and #57 are expected to be negligibly affected due to the following reasons:
 - (a) they are located inside the proposed designation, but are outside of the main construction footprint and there may be scope to avoid effects to these sites;
 - (b) only the outbuildings (e.g., sheds, wash-house) for site #45 are located inside the proposed designation, the house will not be affected;
 - (c) sites #17 and #18 may have been destroyed or damaged by prior road construction.

20. A recent geophysical survey (Parker and Bader, 2020) has identified the likely remains of small fires associated with hunting and fishing encampments at three locations alongside the upper reaches of gullies draining into the Waiwaro (site #16) swamp. Other archaeological remains, such as discarded food scraps or small tools of stone and bone, may be present. Micro-topographic relief contours indicate that small artificial occupation terraces for shelters or storage pits could also have been constructed here. There is a reasonable expectation that similar sites could be found at the adjacent Otepua (site #22) swamp. The Ō2NL Project's effects on these sites are expected to be minor for the following reasons:
 - (a) the types of archaeological features and artefacts that may be found at these sites are relatively common throughout New Zealand;
 - (b) detailed information will be recovered through the excavation and reporting of all archaeological features and artefacts; and
 - (c) excavation results could be developed into interpretative signs to be placed at or near these sites to increase public awareness of the historic occupation of the Ō2NL Project's iwi partners in the Pukehou area where there is currently little or none.

¹⁴ A higher level of archaeological potential exists for parts of the Waikawa Native Reserve, but these areas of low or minor potential are more accurately associated with the Waikawa River (site #22) and Climie's track (site #20).

21. In regards to the Awa a te Tau/Koputaroa stream (site #50), Adkin (1948: 144) noted "*very numerous remains of umu or hāngī*" along or in the immediate vicinity of the stream. As above, a relatively common suite of archaeological remains may be found near the stream and the effects are similarly expected to be minor. A moderate level of effect would be expected if the remains of an extensive cultivation ground were found, but the evidence for this was widely disputed in the Māori Land Court and there is a low probability that this would occur.

Potential effects on sites of low, minor and negligible archaeological potential

22. Mitigated effects on sites of low, minor or negligible archaeological potential will be mostly minor or negligible, though as previously noted archaeological remains are generally not expected to be found at these sites.
23. Of the 39 sites in these categories of archaeological potential, 18 come under the broad category of 'geology and fauna' and are mostly rivers, streams and springs. Any archaeological remains that are found at or in the vicinity of these potential sites are expected to be relatively small in quantity and mostly associated with forest-based hunting or resource collection sites that were seasonally occupied by Māori; larger and more complex settlement sites were mostly located west of the existing SH1. These 'geology and fauna sites' were mostly assigned minor or negligible potential effects for the following reasons:
- (a) any archaeological remains found are likely to consist of features (e.g., fire, hāngī, midden, postholes, small pits) and artefacts (e.g., stone or bone tools) commonly found at archaeological sites throughout New Zealand;
 - (b) although historic sources demonstrate that these sites were occupied by Māori, they also indicate that occupation activities were generally concentrated at locations outside of the proposed designations, predominantly;
 - (i) west of SH1 for rivers, streams and creeks; and
 - (ii) east of the proposed designation along the peaks and ridgelines of the foothills;
 - (c) a geophysical survey at Pukehou (Parker and Bader, 2020) indicates that several significant and high value archaeological sites, which are

- known to be located in the broader landscape, are highly unlikely to be situated inside the proposed designation extent;
- (d) detailed information will be recovered through the excavation and reporting of all archaeological features and artefacts; and
 - (e) excavation results could be developed into interpretative signs to be placed at or near this site to increase public awareness of the sites local significance.
24. The Kuku stream (site #33) and Waiore (site #42) are assigned a low potential effect. The slightly higher effects rating reflects:
- (a) the possibility that kōiwi (human remains), associated with a running battle that may have passed through this area, could be found in the vicinity of the Kuku stream; and
 - (b) that excavation, reporting and signage will not completely mitigate for the loss of the regionally rare and potentially significant Waiore site.¹⁵
25. One stream, the Waiaute (site #24), is assigned a moderate level of potential effect. This high level of residual effect reflects the possibility that nationally significant archaeological remains could be found in the vicinity of this stream.¹⁶ However, the Waiaute is a long stream that flows from the eastern face of Pukehou and joins the Manakau stream at SH1; Adkin (1948: 382) suggests that 'Waiaute' may have been the original name of the Manakau stream itself which joins the Waikawa river near the coast. There is only a low probability that this site is located inside the proposed designation.
26. A minor level of effect is expected for any archaeological remains that may be found at seven Māori or surveyor's tracks and the Wellington-Manawatū Railway. Physical remains of the actual walking tracks are unlikely to have survived, but archaeological features associated with activities occurring alongside these tracks, or working camps/sites alongside the railway, may be found. A minor level of effect is expected as:

¹⁵ The potential significance of the Waiore site is speculated on the basis of statements made in regards to a similarly named place located in the same general area, but outside of the designation extent. Speaking before the Māori Land Court in 1873, Kawana Hunia te Hakeke described a place called Waihau as a place "where we obtained Hinau berried and caught birds... *To Waihau I went to receive the tapu*" (italics added). There are no written descriptions or discussion of Waiore in historic sources and the similarity of the two names does not necessarily indicate a similarity of function or significance.

¹⁶ The name 'Waiaute' translates to 'the stream of the paper-mulberry tree' (Adkin, 1948: 382-383). The paper-mulberry tree (*Broussonetia papyrifera*) was brought to New Zealand from island Polynesia by early Māori settlers. The bark of this tree was used to make cloth, but it is no longer found in New Zealand and evidence for its cultivation in the Horowhenua would be a significant discovery.

- (a) any archaeological remains that are likely to be of a type that is common throughout New Zealand (e.g., small fires, midden, general 19th century material refuse).
 - (b) detailed information will be recovered through the excavation and reporting of all archaeological features and artefacts; and
 - (c) excavation results could be developed into interpretative signs to be placed at or near this site to increase public awareness of the sites local significance.
27. Four houses (sites #46, #51, #52 and #53) and 2 house sites (#35 and #48) may be adversely affected. Most of these sites are expected to be of early 20th century origin but this is not confirmed, so these potential sites are included in the assessment on a precautionary basis. There is no evidence to indicate that any of these houses are particularly early or associated with notable local persons; the excavation, recording and analysis of any archaeological features and artefacts is expected to result in a minor level of effect. One house site (#35) is only expected to be negligibly affected, a drainage ditch and access road for the Ōhau quarry having already been cut through this site.
28. Testimony provided by Muaūpoko witnesses to the Māori Land Court indicates that there was a small settlement and butchery somewhere within the Kohitere clearing (site #41). A partial boundary of this occupied clearing was surveyed in 1899, but the location where the Muaūpoko activity took place within it is unknown. Ground-testing of the geophysical survey results along the proposed Ō2NL Project indicative alignment within the former clearing (Parker and Bader, 2020) indicates that archaeological remains associated with the Muaūpoko occupation are unlikely to be found, but the possibility cannot be entirely ruled out.
29. If archaeological remains associated with mid-19th century occupation by Muaūpoko were found within the Kohitere clearing (site #41), the potential effects would be low for the following reasons:
- (a) post-holes, rubbish pits, wells and other common archaeological features associated with late 19th century residential or industrial life could be found;
 - (b) whole or fragmentary common artefacts of bone, clay, glass, iron, porcelain and wood associated with late 19th century residential, industrial or school life could also be found;

- (c) detailed information will be recovered through the excavation and reporting of all archaeological features and artefacts;
 - (d) excavation results could be developed into interpretative signage to be placed at or near this site to increase public awareness of the sites local significance; however
 - (e) a residual low level of effect would remain as excavation, reporting and signs will not completely mitigate for the loss of regionally rare and locally significant sites.
30. Three former native reserves (the Waikawa, Muhunua No. 4 and 'Heatherlea' reserves, sites #31, #38 and #58 respectively) and 2 occupied clearings (Waerengapoka and Paruauku, sites #15 and #21 respectively) are expected to be only negligibly affected for the following reasons:
- (a) a geophysical survey (Parker and Bader, 2020) of the Ō2NL Project indicative alignment at Pukehou did not detect any magnetic anomalies that would indicate the presence of archaeological sites in areas where the occupied clearings were most likely to be found;
 - (b) Native reserves were mostly densely forested until the late 19th century and were quickly passed into European ownership and there is no evidence for residential occupation of these blocks by the original Māori owners or later purchasers;
 - (c) any archaeological remains that are found in association with the Waerengapoka or Paruauku clearings are likely to be peripheral to the main site and consist of features (for example, fire, hāngī, midden, postholes, small pits) and artefacts (for example, stone or bone tools) commonly found at archaeological sites throughout New Zealand;
 - (d) information will be recovered through the excavation and reporting of all archaeological features and artefacts; and
 - (e) evidence for the Waerengapoka and Paruauku clearings could be developed into interpretative signage to be placed at or near these sites to increase public awareness of their local significance.
31. Geophysical survey results (Parker and Bader, 2020) identified two areas of magnetic disturbance within the former Pukehou Block No. 4A1 native reserve (site #20) that could be associated with archaeological remains or modern horticultural activities. A minor level of potential effect is assigned to this site.