WILLIAMSON
WATER & LAND ADVISORY

Delmore Subdivision, Ōrewa

Preliminary Site Investigation (Ground Contamination)

VINEWAY LTD

WWLA1147 | Rev. 3

13 February 2025

WWLA

Delmore Subdivision, Ōrewa

Project no:	WWLA1147
Document title:	Preliminary Site Investigation (Ground Contamination)
Revision:	3
Date:	13 February 2025
Client name:	Vineway Ltd
Project manager:	[redacted]
Author(s):	[redacted]
File name:	G:\Shared drives\Projects\Acanthus Ltd\WWLA1147_Wainui Subdivision CL\Deliverables\Substantive fast-track application\PSI\WWLA_Delmore_Subdivision_PSI_Rev 3_130225.docx

Williamson Water & Land Advisory

[redacted]

Document history and status

Rev	Date	Description	By	Review	Approved
1	2 December 2024	Preliminary and Detailed Site Investigation (Ground Contamination)	[redacted]	[redacted]	[redacted]
2	5 February 2025	Preliminary and Detailed Site Investigation (Ground Contamination)	[redacted]	[redacted]	[redacted]
3	13 February 2025	Preliminary and Detailed Site Investigation (Ground Contamination)	[redacted]	[redacted]	[redacted]

Distribution of copies

Rev	Date issued	Issued to	Comments
1	2 December 2024	Vineway Ltd, Barkers, Sally Gepp	Draft for client review
2	5 February 2025	Vineway Ltd, Barkers, Sally Gepp	For lodgement
3	13 February 2025	Vineway Ltd, Barkers, Sally Gepp	Update to number of dwellings – for lodgement

Investigation Summary

Williamson Water & Land Advisory Ltd (WWLA) has prepared this Preliminary Site Investigation (PSI) to assist Vineway Ltd with its proposed development of a residential subdivision across six (6) properties in Ōrewa/Wainui, Auckland. The key findings of this report are:

History and potential for contamination [Section 3]	**The site history review confirmed that HAIL activities (those with the greatest potential to cause ground contamination) are highly unlikely to have occurred on the site.** The historical review indicates that site was primarily used for pastoral farming, with some localised planation forestry and/or regenerating scrub / bush, since before 1940 to at least the 1980s. Structures were generally limited to small barns / sheds and stockyards until the area transitioned into rural residential uses from the 1980s. Most of the existing dwellings were constructed in the 2000s (or later).
Preliminary conceptual site model (CSM) [Section 4]	**The CSM, developed to show where ground contamination-related risks for residential redevelopment exist, indicates that there are no unacceptable risks to future occupants or the environment.** Contaminants are highly unlikely to be present at concentrations that present a risk to human health or the environment. However, localised soils around dwellings and associated buildings (garages, sheds, barns etc.) may contain contaminants associated with typical urban activities at concentrations that exceed background (cleanfill) ranges and therefore need to be managed appropriately.
Consenting implications [Section 5.1]	**Consents are not required for ground contamination matters under either the Resource Management National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (2011) Regulation (NESCS) or contaminated land rules in the Auckland Unitary Plan (AUP).** No HAIL activities have been identified, and soils containing 'elevated levels of contaminants' are not expected to be present, thus the requirements of the NESCS and Section E30 of the AUP do not apply to the site. Ground contamination related resource consents are not expected to be required to support the subdivision, change in use or disturbance activities required to develop the site.
Construction implications [Section 5.2]	**Following demolition and clearance of the existing dwellings and associated buildings (garages, sheds, barns etc.) it is expected that earthworks should be able to be managed through standard earthworks controls and procedures.** • No specific soil remediation requirements have been identified for the site but soil and debris around existing dwellings and associated buildings (generally a 2 m wide halo) should either be tested for suitability for reuse, or removed for disposal to appropriate facilities, during the demolition and clearance process. • The Asbestos Regulations require that an asbestos survey is conducted prior to any refurbishment or demolition of structures built prior to the year 2000. Where it is being disturbed asbestos will likely need to be removed by a Licensed Asbestos Removalist. • There are not expected to be any specific contamination-related health and safety requirements for onsite workers during disturbance of soil. • Except for soil and debris around existing dwellings and associated buildings, site soils: - Should be able to be reused onsite without contamination-related constraints; and - If surplus to site requirements, can likely be disposed offsite as cleanfill but cleanfill facility operators will likely require confirmatory testing before accepting the soil. • In accordance with standard industry procedures, works should cease and the affected area isolated if unexpected contamination (e.g., ACM, odorous materials, or discoloured soil) is discovered.

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1. Introduction

Williamson Water & Land Advisory Ltd (WWLA) has prepared this Preliminary Site Investigation (PSI) to assist Vineway Ltd with its proposed development of a residential subdivision across six (6) properties in Ōrewa/Wainui, Auckland (referred to as 'the site', location provided in **Figure 1**).

Figure 1. Site Location (Aerial source: Google Earth)
Approximate site boundaries outlined in red, dashed lines indicate internal boundaries between existing lots

1.1 Background

The project involves the subdivision of just over 109ha in 6 contiguous lots (88, 130 and 132 Upper Ōrewa Road and 53A, 53B and 55 Russell Road) and construction of a master-planned urban, residential development of approximately 1,250 dwellings. Subdivision and construction will occur in 2 stages, comprising 6 substages. Preparatory earthworks across the site comprises cut of 1,272,000 m3 and fill of 953,000 m3 over an area of approximately 58.4ha. Selected scheme plans are provided for reference in **Appendix A**.

Vineway Ltd is lodging an application for the project under the Fast-track Approvals Bill (2024). This investigation has been undertaken to determine if historical activities have occurred that may have led to soil contamination on site (HAIL activities)[1]. Land where HAIL activities have occurred is subject to the requirements of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (the NESCS) and it may also be subject to the contaminated land requirements of the Auckland Unitary Plan (AUP).

[1] Ministry for the Environment's Hazardous Activities and Industries List.

1.2 Scope of works

The scope of this investigation comprised:

1. Review of the history of the site including:
   - Historical aerial photographs sourced from the Auckland Council GeoMaps, Retrolens and Google Earth.
   - Auckland Council property file.
2. A site walkover inspection by a suitably qualified environmental practitioner (SQEP)/ Contaminated Land Specialist.
3. Assessment of the potential for contamination, based on current and historical land use and evaluation of that against the HAIL.
4. Development of a preliminary conceptual site model (CSM) to assess contaminant risks and mitigation requirements.
5. Evaluation of the implications of the findings on design, consenting, earthworks/construction, and post-construction for the proposed development.

1.3 Legislative requirements

WWLA has undertaken this assessment and prepared this report in general accordance with requirements of published industry best practice guidance, principally the Ministry for the Environment's (MfE) *"Contaminated Land Management Guideline No. 1: Reporting on Contaminated Sites in New Zealand (revised 2021)"*. (CLMG1).

This report has been prepared, reviewed, and certified by a SQEP as described in the NESCS and NESCS User's Guide[2]. CVs confirming the SQEP status of our contaminated land specialists are available on request.

[2] Ministry for the Environment. 2012. Users' Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.

2. Site Description

2.1 Site identification

The site consists of six (6) land parcels, surrounded a pastoral setting, as described in **Table 1** and shown in **Figure 1**.

Table 1. Site identification

Address	Legal description	Certificate of Title/'s	Area (ha)
88 Upper Ōrewa Road	Lot 2 DP 418770	472117	15.73
130 Upper Ōrewa Road	Lot 2 DP 153477	NA91C/410	42.20
132 Upper Ōrewa Road	Lot 1 DP 153477	NA91C/409	20.52
53a Russel Road	Lot 1 DP 497022	747403	1.10
53b Russel Road	Lot 2 DP 497022	747404	14.88
55 Russel Road	Lot 1 DP 336616	149880	14.77

2.2 Environmental setting

The environmental setting is described in **Table 2**. The features of the environmental setting are considered in the context of their potential to affect the distribution, mobility and form of contaminants (if present). These variables set the scene and inform the preliminary conceptual site model (CSM) evaluation (**Section 4**), if it is established that activities with potential to cause ground contamination have occurred.

Table 2. Environmental setting

Site surrounds	The site is located within an area that is currently dominated by rural residential (lifestyle blocks) and rural (pastoral grazing) land uses with occasional blocks of regenerating native bush and plantation forestry. As shown in the aerial photographic review (**Appendix B**), several new subdivisions are in various stages of development to the immediate north and east of the site so residential land uses will start to dominate the surrounds (at least to the north and east) in the near future.
Topography and drainage	*The topographical nature of the site impacts where contaminants might migrate to if present.* The topography of the site is dominated by a north-south gully and ridge system in its north. The ridges generally rise to an elevation of some 60 m within the site, with the gullies generally around 20 m elevation. The gullies drain to the south intersecting an easterly flowing tributary of the Ōrewa River in the south of the site. To the south of the tributary the topography rises to Upper Ōrewa and Russell roads. Auckland Council GeoMaps indicates that narrow flood plains are associated with the tributary of the Ōrewa River and feeder streams in most gullies. The tributary of the Ōrewa River discharges into the main Ōrewa River some 1.7 km to the east. The Ōrewa River ultimately discharges into the Hauraki Gulf at Ōrewa Beach, some 4 km to the east. Auckland Council GeoMaps also shows that the site is not currently serviced by any public water, sewerage or stormwater services.
Geology	*Geological conditions can influence how contamination migrates if present, for example, more porous soils can enable contaminants to move more quickly and potentially further than clay-rich soils that retain/bind or prevent penetration of contaminants.* The published geology[3] indicates the site is principally underlain by alternating sandstones and mudstones of the East Coast Bays Formation (ECBF). ECBF rocks typically weather to predominantly fine grained, silt and clay soils. Information available from the New Zealand Geotechnical Database (NZGD) indicates that fine grained alluvial or colluvial soils are likely to be present in the gully inverts in the lower lying parts of the site.
Hydrogeology	*Hydrogeological conditions affect potential risk of contaminants (if present) entering and being transported in groundwater.*

[3] Edbrooke, S.W. (compiler), 2001. Geology of the Auckland area. Scale 1:250,000. Institute of Geological & Nuclear Sciences geological map 3.

	Shallow groundwater is expected to be encountered near surface (<1 m depth) in the gullies and a greater depth (several metres or more) beneath the ridges. Shallow groundwater is expected to follow topography discharging into the gully streams. Information available from the NZGD indicates that regional groundwater is present in the ECBF at some 30 to 50 m below ground level (m BGL).
Sensitive receptors	*Sensitive environmental receptors could include aquatic or terrestrial ecosystems. This is not an ecological assessment but is instead an initial review of the surrounding environment to assess where contaminants (if present) on the site could migrate to and affect.* The tributary of the Ōrewa River and feeder gully streams may be considered sensitive environmental receptors where these have not been modified. Some of the areas of regenerating native bush also have the potential to be considered sensitive environmental receptors.
	Sensitive human receptors could for example be children at a school or kindergarten on or adjacent to a site. Workers on industrial land (including or adjacent to a site) would be considered less sensitive. This people receptor interpretation informs the CSM and also future guideline value selection for evaluation of soil data. Occupiers and users of the adjoining rural residential properties may include sensitive receptors. However, the nearest residences are typically setback at least 20 m from the site and are therefore unlikely to be impacted by ground contamination (if any) associated with it.

3. HAIL Assessment

This section details a HAIL Assessment, a review of current and historical activities to determine whether or not activities listed on MfE's HAIL have occurred on the site. The findings of the HAIL review inform the need for detailed investigations (sampling, if necessary), and the planning assessment.

3.1 Site layout

A site walkover was undertaken by a SQEP from WWLA on 22 April 2024. The following observations regarding the condition and current use of the site were made (refer **Photograph 1** to **Photograph 24** overpage).

- As described in in the preceding sections, the site comprises 6 adjoining properties located on the northern side of Upper Ōrewa and Russell Roads.
- All of the properties were being used for rural and rural residential purposes with pasture being the dominant use (see **Photograph 1**). Several small stands of both plantation forestry (pine) and native bush are present across the wider site (see **Photograph 2**).
- Except for 53a Russell Road each property includes a dwelling and associated infrastructure (typically sheds, garages etc.) near its southern end with gravel or paved accessways from Russell or Upper Ōrewa roads (see **Photograph 3** to **Photograph 6**, **Photograph 11**, **Photograph 16** and **Photograph 23**. 53a Russell Road is undeveloped.
- Except for 55 Russell Road all dwellings and sheds were observed to be constructed of inert building materials: brick, stained wooden cladding, modern weatherboard systems or profiled steel products (see **Photograph 6**, **Photograph 15**, **Photograph 18** and **Photograph 24**). A singe garage on 55 Russell Road was observed to be clad with fibre cement board, a suspected asbestos containing material (ACM), see **Photograph 5**.
- Residential scale vegetable gardens and groves of fruit trees are present on 53b and 55 Russell Road and 88 Upper Ōrewa Road (see examples in **Photograph 12**, **Photograph 13** and **Photograph 16**).
- Small stockyards are present on 53b and 55 Russell Road and 88 and 130 Upper Ōrewa Road (see examples in **Photograph 8**, **Photograph 19** and **Photograph 24**). However, no evidence of livestock dipping facilities was observed in relation to the stockyards (or elsewhere on the properties).
- A half round bard and associated stockyard at 130 Upper Ōrewa Road is configured for handling deer with facilities indicating that animal treatments were administered by oral or pour on application (see **Photograph 18** to **Photograph 22**).
- Several small ponds are present across the wider site, apparently utilised for water supply for stock watering purposes.
- No evidence of onsite disposal of wastes (e.g. farm dumps) was observed. But storage of fuel and/or oil at residential volumes was noted in some localised areas (see **Photograph 9**, **Photograph 10** and **Photograph 15**).
- No signs of stressed vegetation or surface staining were observed during the walkover.

Photograph 1. View to northeast from the accessway to 130 Upper Ōrewa Road showing general topography.

Photograph 2. View of the south from accessway to 130 Upper Ōrewa Road showing stands of both native and plantation forestry.

Photograph 3. View of main dwelling at 55 Russell Road, stained wooden weatherboard cladding

Photograph 4. View of minor dwelling at 55 Russell Road, modern fibre cement cladding.

Photograph 5. Example of sheds between dwellings at 55 Russell Road, single garage to left is clad with suspected ACM.

Photograph 6. Example of sheds between dwellings at 55 Russell Road.

Photograph 7. Contents of shed (behind sheds in Photograph 6) at 55 Russell Road.

Photograph 8. Closeup of stock yard and materials stored at 55 Russell Road.

Photograph 9. Containers of waste oil being stored adjacent to sheds at 55 Russell Road.

Photograph 10. Closeup of waste oil being stored adjacent to sheds at 55 Russell Road.

Photograph 11. View of the main and minor dwelling at 53b Russell Road.

Photograph 12. Residential fruit trees at 53b Russell Road.

Photograph 13. Residential vegetable garden at 53b Russell Road.

Photograph 14. View to east over wood cutting and splitting area adjacent to accessway of 53b Russell Road.

Photograph 15. Fuel and oil containers at wood cutting and splitting area at 53b Russell Road.

Photograph 16. View to northwest over dwelling at 88 Upper Ōrewa Road (not able to be accessed).

Photograph 17. View to west over stockyard at the entrance to 88 Upper Ōrewa Road (not able to be accessed).

Photograph 18. View to north over half round barn and stockyard at 130 Upper Ōrewa Road.

Photograph 19. View to south over half round barn and stockyard at 130 Upper Ōrewa Road.

Photograph 20. View of the interior of the half round barn at 130 Upper Ōrewa Road.

Photograph 21. Stock handling facilities in half round barn at 130 Upper Ōrewa Road.

Photograph 22. Stock handling facilities in half round barn at 130 Upper Ōrewa Road.

Photograph 23. View to west over dwelling at 132 Upper Ōrewa Road.

Photograph 24. View to over stockyard at 132 Upper Ōrewa Road.

3.2 Site history

Review of historical aerial photographs found that the site was primarily used for pastoral farming, with some localised planation forestry and/or regenerating scrub / bush, since before 1940 to at least the 1980s. During this period structures were limited to sheds / barns, stockyards (there is no evidence of livestock dipping facilities) with a dwelling apparently only present on 88 Upper Ōrewa Road. From the 1980s the area transitioned into rural residential uses, in addition to the ongoing rural (pastoral) uses, with further dwellings constructed on 53b Russell Road and 132 Upper Ōrewa Road, but additional dwellings were not built until the 2000s (or later).

3.2.1 Property files

The Auckland Council property files obtained in October and November 2024 were reviewed by a WWLA SQEP. Key information relating to the history of the site, and/or potential for ground contamination, is summarised in **Table 4**. Additionally, letters sent by Auckland Council to the landowners (all dated 4 June 2023) indicates that all of the properties are equipped with on-site wastewater systems or septic tanks.

Table 3. Property file information

53a Russel Road	• A Title plan (LT497022) documents the sub-division of Lot 2 DP 397356 into Lots 1 and 2.
53b Russel Road	• The construction of two retaining walls (8 m and 28 m in length) on each side of the driveway was consented under building consent ABA-1023308 on 13 April 2016. • Building consent documents (BCO10091453; dated 12 April 2017) show the proposed locations of a four-bedroom dwelling, a septic tank, water tank, a temporary shed and the extension of an existing metal driveway. • Building consent documents (BCO10092002; dated 12 April 2017) show the proposed location of a minor household unit, including a garage, to the east of the four-bedroom dwelling.
55 Russel Road	• A building consent (ABA16/04/1999) issued by the RDC and accompanying drawings indicate the construction of a dwelling with a carport. • A new septic tank was installed on the property in 2000. • Consented drawings from 12 November 2023 indicate the expansion of the dwelling as well as shows the location of an existing garage, shed, water tanks, the septic tank, and a gravel driveway.
88 Upper Ōrewa Road	• A building consent (ABA-1001666) was issued by the Rodney District Council (RDC) on 1 October 2007 for the construction of a four-bedroom residence with attached garage and associated earthworks. • A project information memorandum (PIM) related to building consent ABA-1001666, dated 31 August 2007, states that there are no known hazardous contaminants on the site and no identified risk of inundation due to flooding or overland flow. • A further building consent (ABA-1011059) approves the construction of a new shed (91 m^2), which according to an as-built plan is located to the northeast of the dwelling.
130 Upper Ōrewa Road	• A proposed subdivision plan, approved by the RDC on 15 January 1992, documents the division of the property into Lot1 DP 153477 and Lot 2 DP 153477, becoming 132 Upper Ōrewa Road and 130 Upper Ōrewa Road.
132 Upper Ōrewa Road	• A building permit for a new dwelling, including decking with spa pool and fencing, was issued by the Rodney Regional Council in July 1989. Additional drawings indicate the dwelling comprises three-bedrooms and a garage. • Auckland Council approved building consent plans (dated to 14 February 2020) indicate the construction of a fibreglass swimming pool to the east of the dwelling.

3.2.2 Aerial photograph review

Historical aerial imagery available from Retrolens, Auckland Council GeoMaps and Google Earth were reviewed and selected aerial photographs are presented in **Appendix B**. A brief summary of the site history derived from the aerial imagery is provided on a property-by-property basis in **Table 4**.

Table 4. Historical aerial photograph review

53a Russel Road	This property has remained undeveloped and variously covered in either pasture, regenerating scrub / bush or plantation forestry (across its southern half) throughout its history.
53b Russel Road	This property remained undeveloped and variously covered in either pasture, regenerating scrub / bush or plantation forestry (across its southern half) until an accessway and building platform were constructed at near its southern end in 2013. The property was occupied by a shed (near its southeastern corner) and various smaller structures (possibly tiny houses) until a main dwelling and adjacent minor dwelling were constructed in 2017. A small residential orchard was established near the building platform for the dwellings in 2015.
55 Russel Road	This property was undeveloped pasture or regenerating bush in 1940s. A quarry was developed near its northeastern corner in the 1950s but this activity had ceased by 1963 and scrub / bush regenerated across this area. A dwelling was first constructed near the southern end of the property in the mid-1980s (between 1981 and 1988). Only minor changes to the dwelling and surrounds have occurred since. The northern portion of the property was cleared of scrub / bush in the 1990s and plantation forestry established.
88 Upper Ōrewa Road	A single dwelling and shed were present on the road frontage of this property in 1940. These do not appear to have changed materially until they were removed in the early 2000s, after which time a small stockyard is evident. A single dwelling was constructed near the southern end of the site around 2009/2010. A pool, shed and landscaping were added to the site over time, but it has otherwise not change materially since 2010. In the 1950s an accessway to the quarry on 55 Russell Road was provided through this property. This had fallen into disuse by 1963 and little more than a discontinuous farm track by the 1970s.
130 Upper Ōrewa Road	This property has remained undeveloped and variously covered in either pasture, regenerating scrub / bush or plantation forestry (across its southern half) throughout its history. The only structure developed on the property is a small half round barn. Built in the 1970s, this appears to have initially been used as a barn but later repurposed as a stockyard with both indoor and outdoor pens and races, likely to handle deer (see **Section 3.1**).
132 Upper Ōrewa Road	A large shed or barn, accessed from Upper Ōrewa Road, was first constructed near the southern end of this property in the 1950s. Smaller sheds were variously located on the northern portion of the site over time, but only one remains today. A stockyard was developed adjacent to the main southern barn in the late 1980s-early 1990s. A dwelling was also constructed near the southern end of the site in this period. The site has not changed materially since other than the original barn being replaced by more modern farm sheds in the 1990s or 2000s, these sheds are now located outside of the property, immediately adjacent to its eastern boundary.

3.3 Potential for contamination

In summary this assessment has identified very limited potential for significant ground contamination as the site has primarily been used for pastoral farming and rural residential uses. Structures were generally limited to small barns / sheds and stockyards until the area transitioned into rural residential uses from the 1980s. Most of the existing dwellings were constructed in the 2000s (or later).

Potentially contaminating activities are described below along with an assessment of the likelihood and magnitude of any contamination resulting from the activity, and whether the activity constitutes a HAIL. HAIL activities are those recognised by the Ministry for the Environment as having the greatest potential to result in ground contamination. Those activities highlighted red are confirmed HAILs (none), those activities that have potential to have occurred but require soil testing to confirm are highlighted in orange and those that are not a HAIL in the context of this site are indicated in green.

Table 5. Evaluation of potentially contaminating activities from previous and current land use.

Land use and HAIL Activity	Potential Contaminants	Potential likelihood and magnitude of contamination	HAIL Assessment
Asbestos building materials *Activity E1. Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition.*	Asbestos	The majority of structures currently or previously present on the site were either: • Constructed before asbestos was in common use - pre-1940s buildings on 88 Upper Ōrewa Road; or • Constructed after asbestos was in common use - predominantly >2000s era buildings present on the site today; or • Were not observed to include (ACM) on their exterior - barns and sheds are constructed of steel or wooden materials. Suspected ACM material was only observed on a single garage at 55 Russell Road. The materials were observed to be intact but unpainted. Being unpainted means they have the potential to shed fibres to ground during natural weathering processes.	HAIL Activity E1 **does not apply** to the site as the limited ACM was observed to be intact.
Lead-based paint *Activity I: Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment.*	Lead	While lead was widely used in paint in New Zealand until 1965 it had largely been phased out by the early 1980s (white lead was banned in 1965). As a result, it is highly unlikely that the existing dwellings would have been finished with paints containing high concentrations of lead. As most of the older barns/sheds are unpainted these are also not considered to be source of lead contamination. The few older structures that are painted, or those previously removed (pre-1940s buildings on 88 Upper Ōrewa Road) are unlikely to present a significant source of contamination, either due to their small scale or the dilution of contamination that likely occurred when the buildings were demolished and the areas repurposed.	HAIL Activity I **is not considered to apply** to the site as contaminants are not expected to be present at concentrations posing a risk to human health or the environment.
Vehicle servicing *Activity F4: Motor vehicles workshops.*	Petroleum hydrocarbons (fuels, oils, grease etc.), solvents, metals	Some of the sheds were being used for the storage of farm equipment, including tractors, motor vehicles etc. Some evidence of previous maintenance of farm equipment/ vehicles was observed (fuel and oil containers). However, no evidence of spills or significant staining was noted. We consider that the nature of the activity is consistent with a residential property where the landowner maintains their own	HAIL activity F4 **does not apply** to the site.

Land use and HAIL Activity	Potential Contaminants	Potential likelihood and magnitude of contamination	HAIL Assessment
		vehicles (i.e. it is not a commercial vehicle servicing activity). As the HAIL guidance[4] provides an exclusion for landowners servicing their own vehicles we consider that HAIL activity F4 does not apply to the site.	
Operation of effluent ponds and septic tanks *Activity G5: Waste disposal to land.*	Pathogens, nutrients, metals	As described in the preceding sections, the site is not currently serviced by public sewerage systems therefore animal and human wastes have been discharged to ground via a variety of treatment systems. The HAIL guidance[4] includes exclusions for: • *"Agricultural spreading of animal effluents (eg, dairy shed effluent) or manure where normal animal husbandry practices are not expected to result in contamination of effluent or manure".; and* • *"Domestic septic tanks. While these systems may discharge wastewater to ground containing biological hazards, the amount of organic chemicals or inorganic contaminants, such as metals and metalloids, that could persist in soil will generally be low."* For these reasons we consider that HAIL activity G5 does not apply to the site.	HAIL activity G5 **does not apply** to the site.
Residential orchards and vegetable gardens *Activities A1 or A10 relating to handing and use of agrichemicals including pesticides*	Metals, pesticides	The HAIL guidance[4] includes an exclusion (in Category A1) for *"..storage or mixing of agrichemicals in a residential setting (where small volumes of product would be handled at one time and any spills that were to occur would be limited in extent)".* This assessment has not identified any evidence of these activities having occurred a greater than a residential scale. For this reason, we consider that HAIL activities A1 and A10 do not apply to the site.	HAIL activities A1 and/or A10 **do not apply** to the site.
Historic quarrying on 55 Russell Road *Activity E7: Mining industries…*	Various but metals and hydrocarbons are common	The HAIL guidance[4] includes an exclusion for *"gravel extraction or rock quarrying for aggregate or building stone (no likelihood of soil contamination from the gravel or rock materials but may have ancillary activities covered by other HAIL activities)".* As there is no evidence of ancillary activities associated with the quarry we consider that HAIL activity E7 does not apply to the site.	HAIL activity E7 **does not apply** to the site.

[4] Ministry for the Environment. 2023. Hazardous Activities and Industries List guidance: Identifying HAIL Land.

4. Preliminary Conceptual Site Model

A conceptual site model (CSM) indicates known and potential sources of contamination, routes of exposure (pathways), and the receptors that are affected by contaminants moving along those pathways. Receptors may be people or the environment. *The CSM's purpose is to set out risks to people and the environment (if any) associated with any proposed activity (short or long term) on the land.* Colour coding is used in the source – pathway – receptor analysis presented below to indicate the:

- Potentially complete exposure pathways i.e. those where there may be a risk to people and/or the environment if appropriate controls are not in place; and
- Incomplete exposure pathways where there is no risk to human or environmental receptors.

Table 5. Preliminary Conceptual Site Model

Source	Receptor	Exposure pathway	Acceptable risk (Yes/No) and assessment
Surficial soil impacted by typical urban activities	Construction workers and neighbouring site occupants during soil disturbance	Dermal contact, ingestion	**Yes** Contaminants are highly unlikely to be present at concentrations that present a risk to human health. In addition, it is expected that topsoil will be removed to facilitate the proposed development and any impacted soils can be appropriately managed or disposed of at that time.
	Future site occupants		
	Ecological receptors at the nearest surface water bodies	Discharges via surface and groundwater	**Yes** Contaminants are highly unlikely to be present at concentrations that present a risk to environment. In addition, it is expected that topsoil will be removed to facilitate the proposed development and any impacted soils can be appropriately managed or disposed of at that time.
	Receptors at the soil receiving sites	Discharges to the receiving environment	**No** While contaminants are highly unlikely to be present at concentrations that present a risk to human health or the environment, localised soils around dwellings and associated structures may contain contaminants at concentrations that exceed background (cleanfill) ranges and therefore need to be reused or disposed of appropriately.

5. Development Implications

5.1 Consenting implications

5.1.1 Consents required

For the following reasons we consider that consents for ground contamination matters are NOT required under either the NESCS or Section E30 of the AUP:

- The NESCS applies to specific activities on land (including soil sampling, soil disturbance and removal, subdivision and land use change) where an activity included on the HAIL has occurred. As described in the preceding sections, this assessment has not identified any evidence to suggest that activities considered to be HAILs have occurred on the site. As HAIL activities are NOT more likely than not to occurred the NESCS does not apply to the proposal to develop the site, which will include subdivision, land use change and soil disturbance.
- The contaminated land rules of the AUP (Section E30) apply to soils that contain 'elevated levels of contaminants'. As no HAIL activities have been identified as occurring on the site it is highly unlikely that soils that containing elevated levels of contaminants will be present.

As is typical for all urban activities, there is however potential for localised contamination around (generally a 2 m wide halo) existing dwellings and associated buildings (garages, sheds, barns etc.). However, we consider that these can be dealt with during demolition and clearance activities. Council has the necessary mechanisms available to it under the Asbestos Regulations[5] and/or Building Act to ensure that the any minor soil contamination is appropriately addressed.

5.1.2 Proposed conditions of consent

While we consider that consents for ground contamination matters are NOT required under either the NESCS or Section E30 of the AUP, for completeness it would be prudent to include a condition of consent to ensure that the soil and debris around existing dwellings and associated buildings are appropriately dealt with during the demolition and site clearance process. We recommend the following condition of consent is included in the consent bundle:

> *Following demolition and removal of the existing dwellings and other buildings (garages, sheds, barns etc.) surficial soil and debris (to the lesser of 300 mm depth or top of natural insitu soils) across the footprint of each former structure, and a halo 2 m wide on all sides around it, shall be either:*
>
> *a. Excavated and disposed offsite to a consented Class 1 landfill if physically / geotechnically unsuitable for reuse; or*
>
> *b. Tested by a suitably qualified and experienced contaminated land professional (SQEP), as defined in the Users' Guide to the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health, 2012, to confirm its suitability for reuse onsite or disposal to alternative offsite facilities. All sampling and testing must be undertaken in accordance with the Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils (Ministry for the Environment, revised 2021).*

[5] Health and Safety at Work (Asbestos) Regulations 2016.

5.2 Construction implications

Following demolition and clearance of the existing dwellings and associated buildings (garages, sheds, barns etc.) it is expected that earthworks should largely be able to be managed through standard earthworks controls and procedures.

Table 6. Construction implications

Demolition and clearance requirements	No specific soil remediation requirements have been identified for the site but soil and debris around existing dwellings and associated buildings (generally a 2 m wide halo) should either be tested for suitability for reuse, or removed for disposal to appropriate facilities, during the demolition and clearance process. The Asbestos Regulations require that an asbestos survey is conducted prior to any refurbishment or demolition of structures built prior to the year 2000. Where it is being disturbed asbestos will likely need to be removed by a Licensed Asbestos Removalist.
Earthworks controls	Standard earthworks controls are expected to be suitable for controlling the localised contamination (if any) around existing dwellings and associated buildings.
Health and safety	Aside from those associated with asbestos removal there are not expected to be any specific contamination-related health and safety requirements for onsite workers during disturbance of soil. Good hygiene practices should always be followed, such as washing hands before eating and drinking.
Soil reuse	Other than soil and debris around existing dwellings and associated buildings (generally a 2 m wide halo) soil should be able to be reused without contamination-related constraints.
Soil disposal	Other than soil and debris around existing dwellings and associated buildings, surplus soil should be able to be disposed offsite as cleanfill. However, cleanfill facility operators are likely to require confirmatory testing before they will receive surplus soils. Soil and debris around existing dwellings and associated buildings (generally a 2 m wide halo) is expected to require disposal to managed fill or landfill. Testing will be required unless the material is disposed to landfill (for example as mullock).
Unexpected discovery protocols	In accordance with standard industry procedures works should cease and the affected area be isolated if unexpected contamination is discovered. A SQEP shall be engaged to advise on how to proceed. Typical unexpected materials can include: • ACM, visible as white/pale fragments of fibreboard sheeting, or other demolition material, signifying filling with waste may have occurred. • Odorous materials (i.e., hydrocarbons, solvent odour). • Discoloured soil (green, black). Putrescible material.

6. Conclusions

This report has been prepared to assist Vineway Ltd with its proposed development of a residential subdivision across six (6) properties in Ōrewa/Wainui, Auckland. The site was originally pastoral farmland before transitioning to rural residential use, alongside ongoing pastoral farming, from the 1980s.

No HAIL activities have been identified and soils containing 'elevated levels of contaminants' are not expected to be present. On this basis ground contamination related resource consents are therefore not expected to be required to support the subdivision, change in use or disturbance activities required to develop the site.

Contaminants are highly unlikely to be present at concentrations that present a risk to human health or the environment. However, localised soils around existing dwellings and associated buildings may contain contaminants, associated with typical urban activities, at concentrations that exceed background levels and therefore require appropriate reuse or disposal. We consider that these can be dealt with during demolition and clearance activities. Council has the necessary mechanisms available to it under the Asbestos Regulations[6] and/or Building Act to ensure that the any minor soil contamination is appropriately addressed

Ground contamination controls are not expected to be necessary, and earthworks can be managed with standard procedures. Except around existing dwellings and buildings (garages, sheds, barns etc.), soil is expected to be reused without contamination-related constraints. If surplus to site requirements it is expected to be able to be disposed of as cleanfill. In accordance with standard industry procedures, if unexpected contamination is discovered, work must cease in the affected area and an assessment be undertaken by a SQEP.

[6] Health and Safety at Work (Asbestos) Regulations 2016.

Appendix A. Selected scheme plans

NUKUMEA SCENIC RESERVE

WALKWAYS AND ENHANCEMENT PLANTING PROPOSED WITHIN S.E.A AND SURROUNDING OPEN GREEN SPACES **APPROX 240,800m²**

PLANTED BATTER SLOPE WITH 10M BUILDING OFFSET FROM NUKUMEA SCENIC RESERVE

WINDING WALKWAY PROPOSED INTO OPEN GREEN SPACE - **APPROX 53,700m²**

PUBLIC PEDESTRIAN PATH TO CONNECT INTO PAPER ROAD

ARA HILLS
CURRENTLY UNDER CONSTRUCTION

ROAD OFFSET FROM S.E.A

3,200m² PARK

BATTER SLOPE AND 10M BUILDING OFFSET TO S.E.A

BATTER SLOPE AND 10M BUILDING OFFSET TO S.E.A

N.O.R 6 ROAD TO BE CONSTRUCTED WITHIN THE PROJECT BOUNDARIES BY VINEWAY LIMITED

GRAND DRIVE CONNECTION

JOAL PEDESTRIAN ACCESS CONSTRUCTED WITHIN THE DELMORE SITE BOUNDARY. ROAD RESERVE TO BE VESTED BY A.V. JENNINGS AS PART OF THE ARA HILLS RESOURCE CONSENT

ARA HILLS
CURRENTLY UNDER CONSTRUCTION

W.W PUMP STATION LOCATION

PROPOSED INTERNAL ROAD TO CONNECT TO UPPER OREWA ROAD. REFER TO CIVIL ENGINEER DRAWINGS FOR DETAIL

UPPER OREWA RD

RUSSELL RD

NORTHERN GATEWAY TOLL ROAD

UNSERVICED SUPERLOT FOR FUTURE DEVELOPMENT

3,300m² EXTENT FOR OFFSET PLANTING. THIS CREATES A 'LINK' BETWEEN THE DELMORE STREAM AREA AND S.E.A TO THE SOUTH OF RUSSELL ROAD

TEMPORARY W.W TREATMENT PLANT LOCATION

ONCE DECOMMISSIONED, THE 10 PROPOSED LOTS SHOWN WILL BE CONSTRUCTED

PEDESTRIAN ACCESS TO RUSSELL ROAD

TERRA STUDIO

PROJECT KEY

PUBLIC REALM

LEGAL

- WIDER SITE BOUNDARY
- INTERNAL EX. SITE BOUNDARY
- N.O.R 6 DESIGNATION

SITE

- STREAM
- WETLAND
- CONSENT NOTICE AREA
- SIGNIFICANT ECOLOGICAL AREA
- DRAINAGE RESERVE TO VEST
- OPEN GREEN SPACE
- OFFSET PLANTING
- W.W PUMP STATION
- PUBLIC PATH - DESIGN TBC

PRIVATE REALM

- PRIVATE LOT
  NOTE: ONLY THE 'NET' SITE IS DISPLAYED AT THIS SCALE. FOR 'GROSS' LOT BOUNDARIES WHICH EXTEND OVER THE RIPARIAN MARIGN, REFER EITHER TO THE CIVIL SCHEME PLAN OR THE 1:200 SCALE ARCHITECTURAL DRAWINGS

TOTAL LOTS

STAGE 1	**469**
STAGE 2	**749** + SUPERLOT
TOTAL	**1218** + SUPERLOT

TYPOLOGY MATRIX

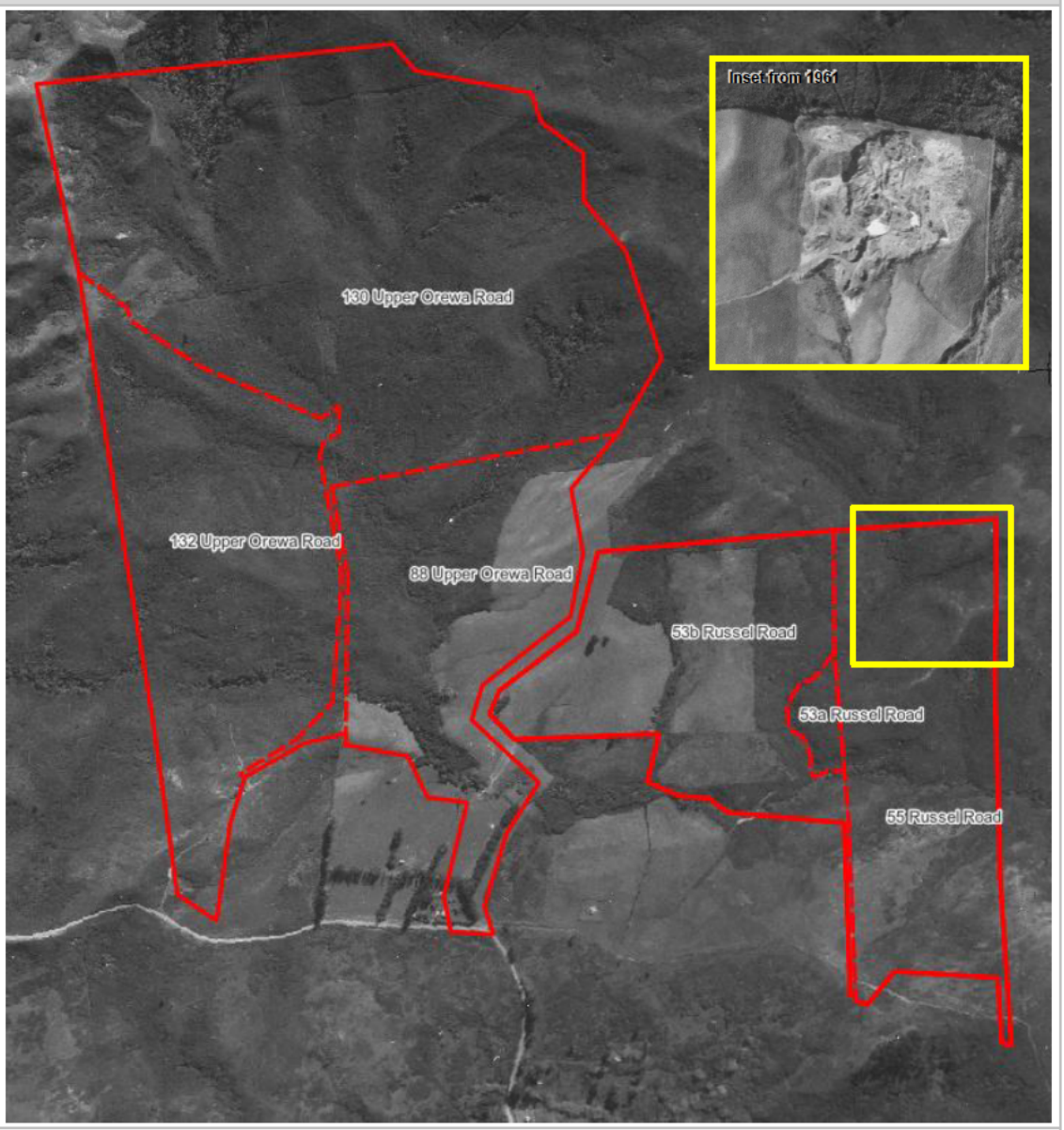
STANDARD FLOOR PLANS	**22**
BESPOKE FLOOR PLANS	**42**
SINGLE LEVEL	**492** (40%)
TWO LEVEL	**726** (60%)
3-BED TYPOLOGY	**536** (44%)
4-BED TYPOLOGY	**362** (30%)
5-BED TYPOLOGY	**320** (26%)

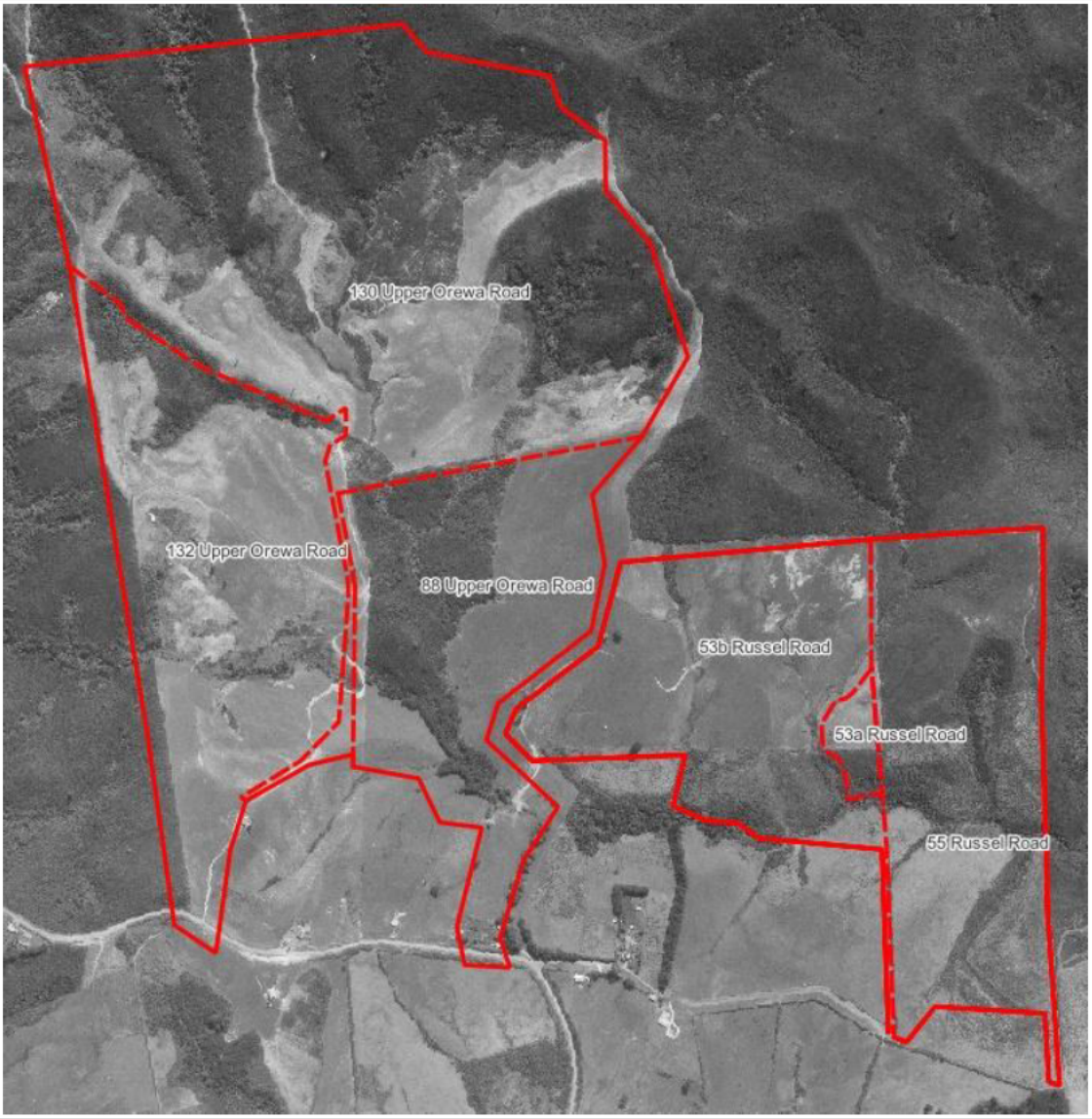
CLIENT	VINEWAY LIMITED
PROJECT NAME	DELMORE
DRAWING TITLE	SITE - PROPOSED
SCALE	1:3000
REVISION NO.	COORDINATION SET

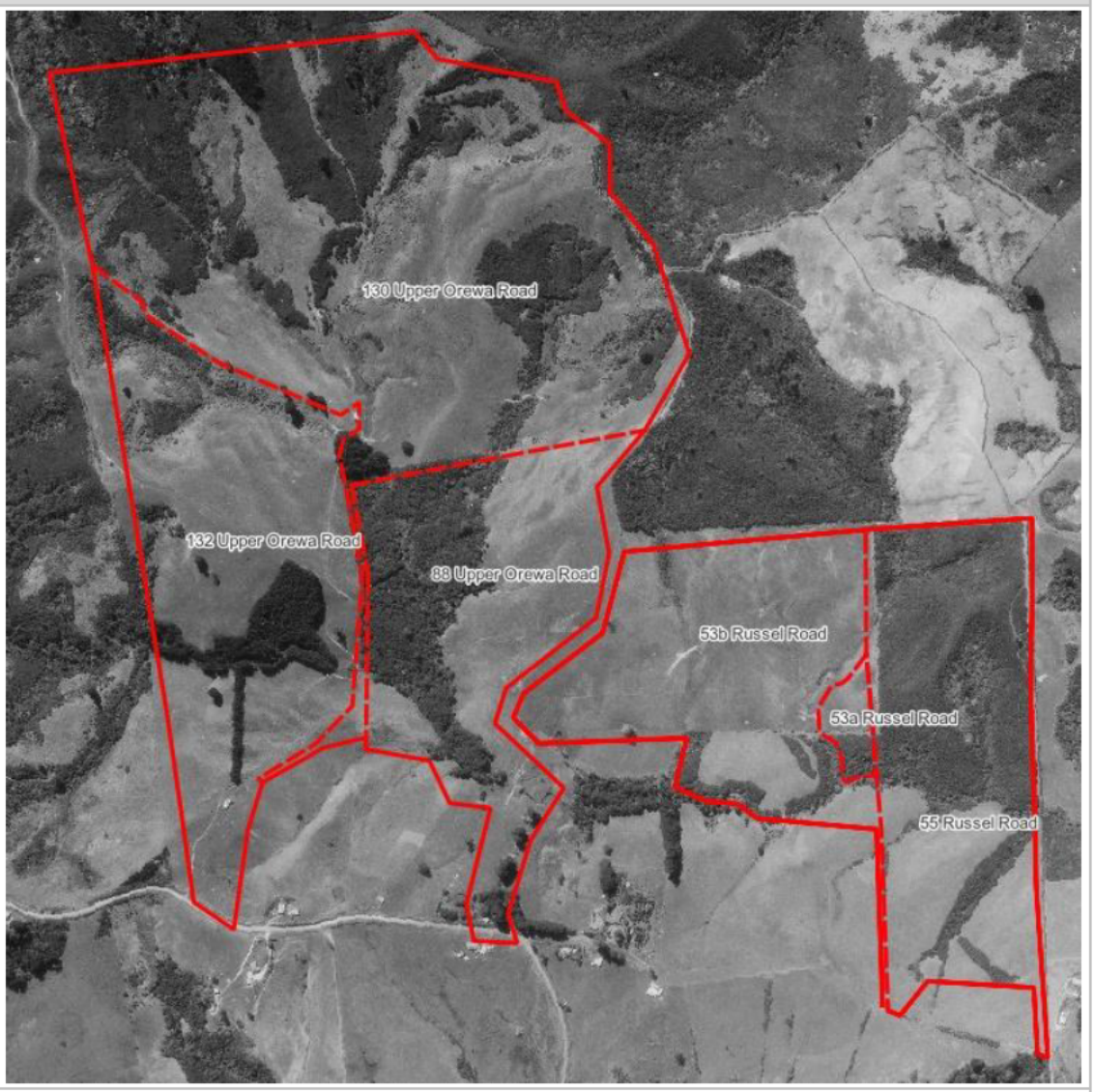
DRAWING NO.

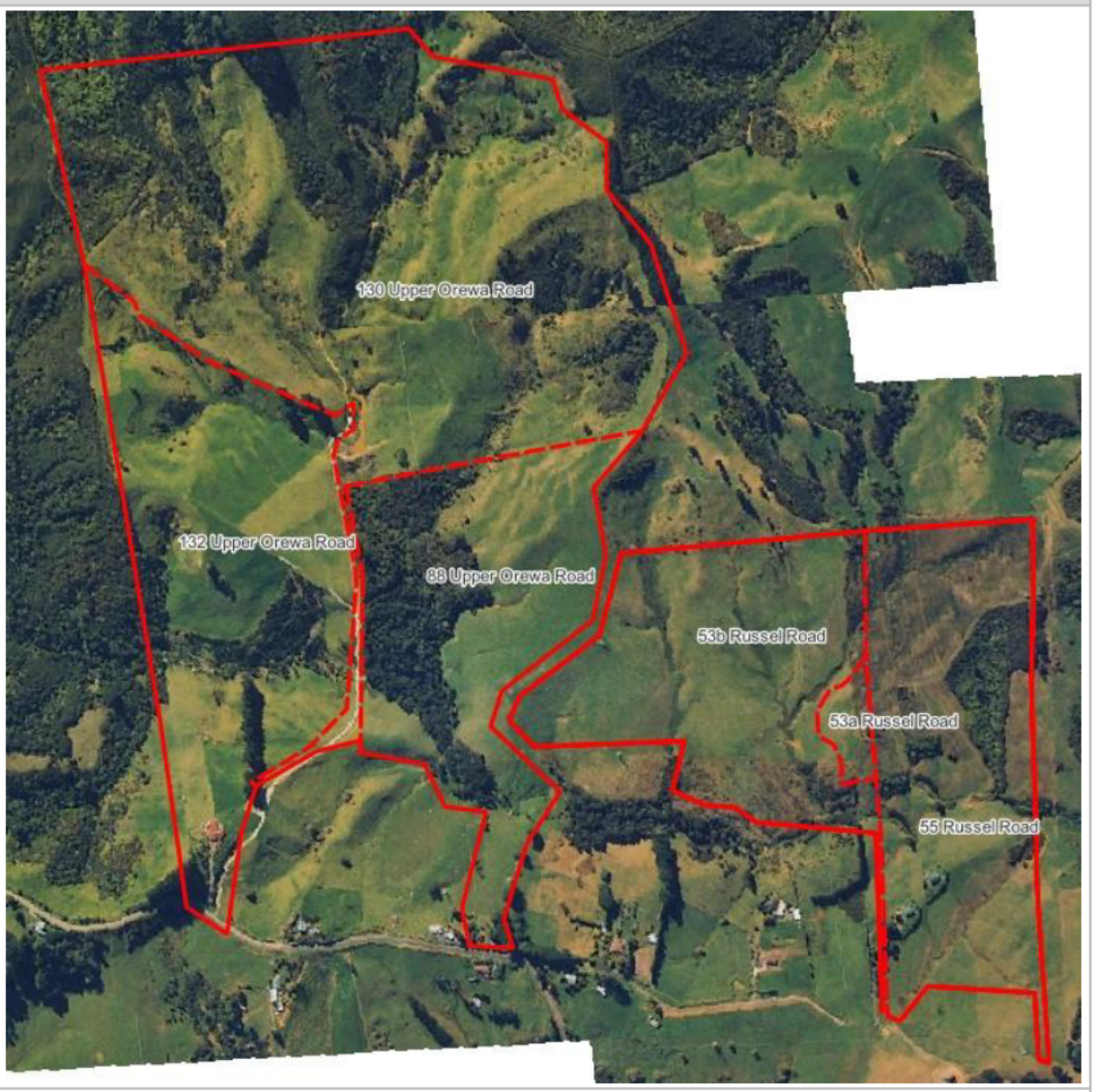
A-S-1-03

Appendix B. Historic aerial photographs

Photograph date (source)	Activities
1940 Retrolens (SN143/83/38)	 **Notable activities or changes:** • The property was primarily undeveloped, comprising a mixture of pasture and regenerating bush at this time. • Upper Ōrewa Road has been formed but Russell Road appears to be a farm track. • A single dwelling and shed were present on the road frontage of 88 Upper Ōrewa Road, otherwise structures are limited to occasional small barns or sheds. A quarry was developed near the northeastern corner of 55 Russell Road in the 1950s (see inset in yellow outline). Quarrying of limestone rock has been a common activity in this area, both historically and currently. As shown in inset, no permanent structures were associated with the quarrying activity. The access road to the quarry crossed to the west exiting via 88 Upper Ōrewa Road.

Photograph date (source)	Activities
1963 Retrolens (SN1565/C/5)	
	Notable activities or changes: • Much of the regenerating bush has been cleared with pastoral use becoming dominant • Russell Road has now been formed. • Quarry operations have ceased on 55 Russell Road and the accessway appears to have fallen into disuse. • A large shed or barn, accessed from Upper Ōrewa Road, has been constructed near the southern end of 132 Upper Ōrewa Road.

Photograph date (source)	Activities
1981 Retrolens (SN5783A/F/18)	 **Notable activities or changes:** • A large shed or barn has been constructed in northeastern corner of 132 Upper Ōrewa Road, where it adjoins the southern end of 130 Upper Ōrewa Road. It is not clear from this image which property the structure was associated with. • An area of plantation forest has been established near the centre of 132 Upper Ōrewa Road. No other notable changes are evident.

Photograph date (source)	Activities
1996 GeoMaps	 **Notable activities or changes:** • Dwellings has been constructed near the southern end of the following properties: 55 Russell Road - a dwelling was first constructed in the mid-1980s (between 1981 and 1988); and 132 Upper Ōrewa Road – a dwelling was first constructed in the late 1980s-early 1990s. • The northern portion of 55 Russell Road has bee cleared of scrub / bush.

Photograph date (source)	Activities
2023 Google Earth	 **Notable activities or changes:** • 53b Russell Road - an accessway and building platform were constructed at near the southern end of this property in 2013. The property was occupied by a shed (near its southeastern corner) and various smaller structures (possibly tiny houses) until a main dwelling and adjacent minor dwelling were constructed in 2017. A small residential orchard was established near the building platform for the dwellings in 2015. • 88 Upper Ōrewa Road - the original roadside dwelling and shed were removed from this property in the early 2000s, after which time a small stockyard is evident. A single dwelling was constructed near the southern end of the site around 2009/2010. A pool, shed and landscaping were added to the site over time, but it has otherwise not change materially since 2010. • 132 Upper Ōrewa Road – the original barn near the southern end of the property was replaced by more modern farm sheds in the 1990s or 2000s, these sheds are now located outside of the property, immediately adjacent to its eastern boundary.