

DETAILED SITE INVESTIGATION (DSI)

SPRINGHILL FARM LIFESTYLE DEVELOPMENT, STATE HIGHWAY 50,
ONGAONGA



Reference Number: REP-H0151/DSI/APR21

PREPARED FOR: SPRINGHILL FARM HOLDINGS, C/- DEVELOPMENT NOUS LTD

09 APRIL 2021



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Statement

This site investigation has been prepared in accordance with the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011. It has been managed by a suitably qualified and experienced practitioner (SQEP); and reported on in accordance with the current edition of the Ministry for the Environment's *Contaminated Land Management Guidelines No.1 – Reporting on Contaminated Sites in New Zealand*.

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Thank you for the opportunity to carry out this investigation. Should you have any queries regarding this report please do not hesitate to contact us on 09 475 0222.

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EXECUTIVE SUMMARY

Springhill farm Holdings propose to develop the piece of land encompassed by 1,152, 1,200, and 1,080 State Highway 50, and 604 and 612 Wakarara Road, Onga Onga through a large scale rural residential subdivision, forming some 311 rural residential lots ranging from 4,010 m² to 1.4ha in size.

As part of the consenting process for the proposed subdivision, Geosciences Ltd (GSL) were engaged to conduct a detailed site investigation (DSI) in accordance with the MfE contaminated land management guidelines across the 220 ha of pastoral farmland. The DSI which included a review of available aerial imagery, a review of the current and historical records of title for the properties, and a review of publicly available environmental information from Hawkes Bay Regional Council and interviews with the current and former landowners identified that the site has been utilised for pastoral farming activities for in excess of 60 years. HAIL activities were identified within discrete portions of the site only and included:

Those activities can be summarised as:

- Operation of a sheep dip / spray race - HAIL Item A.8;
- Potential use of lead based paints - HAIL Item I where risk to human health is present only;
- Farm dump - HAIL Item G.3;
- Storage Drums for Fuel – HAIL Item A.17; and
- Onsite wastewater discharges to Land – HAIL Item G.5.

Based on the findings of the desktop study a conceptual model for potential contamination was developed noting the above potential sources of contamination were largely confined to the central yard areas which encompassed an estimate 4 ha in size. The conceptual site model identified the expected distribution of contaminants resulting from those potential sources was likely concentrated at surface from spills and general discharges and included the potential for discrete hotspots to be present across the central yard where activities were concentrated.

Analytical results revealed that discrete areas of surficial soil surrounding the sheep dip have been impacted by arsenic concentrations in excess of the NES rural residential landuse soil contaminant standards (SCS) and Eco-SGV criteria for protection of environmental receptors. While soil sampling surrounding a number of historical sheds in the yard area returned concentrations of lead in excess of the NES rural residential SCS and the Eco-SGV criteria for the protection of environmental receptors. Concentrations of zinc were also returned in three locations in excess of the Eco-SGV criteria.

Consequently, the regulations of the NES will be applicable to the proposed subdivision and development on account of not being able to meet Regulation 5(9). The proposed development will likely require resource consent as a Restricted Discretionary Activity under Regulation 10 of the NES, subject to the controls of a remediation action plan / site management plan (SMP).

The controls required under Regulation 10 of the NES are considered appropriate to meet the contamination requirements of the Hawkes Bay Regional Resource Management Plan however a short term discharge consent as a discretionary activity is likely required to facilitate remedial earthworks.

On account of intrusive soil sampling identifying impacted soil assessed as presenting a potential risk to human health and sensitive environmental receptors, remedial actions will be required to ensure that the piece of land is made fit for purpose. GSL recommends the following additional works be performed:

- Delineation soil sampling be undertaken across the areas adversely impacted to determine the lateral and vertical extent of any impacted soils as follows:
 - Grid based soil sampling using cardinal delineation points around the areas of identified lead impacts in the central yard portion of the site;
 - Expanding ring sampling to the south and east of the sheep dip to confirm the full extent of plume discharge beyond SS17 and SS11 alongside further depth soil sampling to confirm the extent;
- Submission of an updated Remediation Action Plan to Council prior to any remedial works commencing on site;
- In the event of demolition and removal of the existing residences, commissioning of Hazardous building material surveys to identify the full extent of any asbestos containing materials present and allow for licensed removal where required prior to any demolition occurring in accordance with the Health and Safety at Work (Asbestos) Regulations 2016;
- Decommissioning and removal of onsite wastewater treatment systems in accordance with the recommendations of the Draft RAP where these are no longer required; and
- Site Validation inspections, sampling and reporting as necessary to confirm that impacted soils have been appropriately remediated and managed in accordance with the Council approved Remediation Action Plan and all residual soils are fit for the proposed end rural residential land use standard.

A draft Remediation Action Plan has been prepared alongside this DSI to reflect the above recommendations and appropriate conditions of consent can be utilised to ensure the above recommendations are completed prior to development. Conditions should include submission of delineation soil sampling results and an updated RAP to Central Hawke's Bay District Council for approval and submission of a Site Validation Report upon completion of remediation.

1 INTRODUCTION

Geosciences Ltd (GSL) has prepared the following report for Development Nous Ltd on behalf of Springhill Farm Holdings in accordance with the GSL proposal, Ref: *Pro-2308/Feb21*, dated 17 February 2021.

This report has been prepared in accordance with the Ministry for the Environment (MfE) Contaminated Land Management Guidelines (CLMG): No. 1 - *"Guidelines for Reporting on Contaminated Sites in New Zealand"*, and No. 5 – *"Site Investigation and Analysis of Soils"* (References 1 and 2).

2 PROPERTY DETAILS

Table 1: Property Details

Location	Legal Description	Size
1,152 State Highway 50, 1,200 SH50, & 1,080 SH50, Ongaonga	Part Section 2 Block IV Ruatahewa SD	176.1733 Ha
604 & 612 Wakarara Road, Ongaonga	Lot 2 DP 395788	44.3915 Ha
Total Area		220.5648 Ha

The properties at the above addresses, and hereafter collectively referred to as 'the site' in this report lie in a rural area of the Central Hawkes Bay area, approximately 2.75 km to the north of the Ongaonga township and approximately 15.5 km to the west of the Waipawa township. The site consists of some 220 Ha of pastoral grazing land with some residual farm infrastructure in a central yard on the SH50 section of the site.

2.1 ENVIRONMENTAL CONTEXT

2.1.1 GEOLOGY & GEOHYDROLOGY

The local geology is described by Kingma (Reference 7) as poorly to moderately sorted gravel with minor sand and silt underlying terraces; includes minor deposits and loess of the Ohakea alluvial terrace deposits.

2.1.2 TOPOGRAPHY AND DRAINAGE

The site is generally flat lying and elevated approximately with an overall slope from west to east from a high point of approximately 230 m above sea level (asl) on the western boundary falling to a low point of approximately 220 m asl on the eastern boundary.

The site is bisected by an unnamed stream which is a tributary of the Kahahakuri Stream, which is in turn a tributary of the Waipawa River. The site is not listed as a flood risk area on the Hawkes Bay Regional Council Hawkes Bay Hazard Portal map.

2.1.3 EARTHQUAKE LIQUEFACTION AND AMPLIFICATION

The site is not listed on the Hawkes Bay Regional Hazard map low to medium risk for earthquake amplification and is not included on the potential liquefaction areas overlay.

2.1.4 AQUIFERS

The site is located within the Ruataniwha Zero Yield Zone, identified as a confined aquifer on the Hawkes Bay Regional Council Productive Aquifer System GIS overlay.

Hawkes Bay Regional Council monitor two groundwater bores in the area of the site; Well 15021 situated to the northeast of the site adjacent to SH50 and the Waipawa River, and Well 16249 at the intersection of SH50 and Wakarara Road to the southeast of the site. Seasonal groundwater level changes in each borehole range from a late summer low of between -15 m and -8 m below relative ground level in Well 15021 and -10 m to -6 m below relative ground level in Well 16249 to midwinter highs of -0.2 m to -1.2 m below relative ground level in Well 15021 and -4 m to -2 m in Well 16249. Based on this information and the relative topographical contour layers, a shallow groundwater table is likely to be present between -2m during winter conditions and up to -10m at summer low.

3 PROPOSED CHANGE IN LANDUSE, SUBDIVISION AND DEVELOPMENT

Springhill Farm Holdings propose to undertake a 311 lot subdivision of the site across 16 stages with lot sizes ranging from 4,010 m² to 1.4 ha in size. The realisation of the proposed subdivision will result in the change in landuse from rural production land to rural residential landuse. While earthworks plans are not available at the time of drafting this investigation, GSL notes that as a minimum, some small scale earthworks will be required on each of the lots when development and construction activities are undertaken. A copy of the proposed scheme plan has been included in Appendix A.

As a result of the proposed change in landuse, subdivision and development it will be necessary to address the requirements of the following applicable standards and regulations for the site.

3.1 NATIONAL ENVIRONMENTAL STANDARD (NES)

The *National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health* (NES) (MfE, 2012), which came into effect on 1 January 2012, ensures that land affected by contaminants in soil is appropriately identified and assessed when soil disturbance and/or land development activities take place and, if necessary, remediated or the contaminants contained to make the land safe for human use.

Under the NES, land is considered to be actually or potentially contaminated if an activity or industry on the MfE Hazardous Activities and Industries List (HAIL) has been, is, or is more likely than not to have been, undertaken on the land. Consequently, a subdivision or development on

HAIL land requires a detailed site investigation (DSI) of the piece of land to determine if there is a risk to human health as a result of the former activities.

The NES defines five standard landuse scenarios for which soil contaminant standards have been derived. The most sensitive landuse scenario applicable to the proposed change in landuse, subdivision and development at this site is defined by the NES as: Rural Residential with up to 25% Homegrown Produce.

3.2 CENTRAL HAWKE'S BAY DISTRICT PLAN

The District Plan for Central Hawke's Bay is a first generation plan that pre-dates the NES and does not contain any specific parameters regarding soil contamination. Therefore, assessment under the NES is sufficient to address District Plan jurisdictions.

3.3 HAWKES BAY REGIONAL RESOURCE MANAGEMENT PLAN (RRMP)

Section 30(1)(f) of the Resource Management Act 1991 provides the Hawkes Bay Regional Council with a statutory duty to investigate land for the purpose of identifying and monitoring contaminated land and for the control of discharges of contaminants into or onto land or water and discharges to air.

With respect to the Regional Plan, Rules 47 – 52 (Chapter 6.6.7 *Generic Discharges of Contaminants – Discharges to Land/Water*) cover the discharges of contaminants to land. The RRMP outlines the classification status of each activity, conditions, standards, and terms to be met and matters for Council's control / discretion.

4 DSI OBJECTIVES

The objectives of this investigation were to assess:

- the soil quality and associated risk to human health and the environment as a result of potential contamination in soil on the site as a result of former HAIL activities;
- the resulting status of the activity under the NES;
- what, if any, contaminated land rules of the RRMP apply to the proposed subdivision and development; and
- any further work that may be required under the NES, or the RRMP as a result of the soil quality on site.

5 SCOPE OF WORKS

To achieve the objectives of the DSI, GSL has undertaken the following:

- An historic appraisal of the properties by a study of historical aerial photographs;
- A review of the current and historic certificates of titles of the property;
- A review of previous environmental / geotechnical reports (if any); and

- A site visit and walkover of the properties and the collection of soil samples; and
- The preparation of one inclusive report in accordance with contaminated land management guideline No.1 – “Reporting on contaminated sites in New Zealand” (Ministry for the Environment, 2011) detailing the findings of this investigation and the recommendations, if any, for further work.

6 SITE HISTORY

A desktop study of publicly available files and photographs was undertaken to determine the history of the site with respect to any current or historic potentially contaminating landuses.

6.1 RECORDS OF TITLE

GSL has reviewed copies of the current and historic Records of Title for the aforementioned properties, including any instruments on the title which detail relevant property information such as: current ownership, registered interests, easements, covenants, lease restrictions and transmissions, to determine if pre-existing consent notices or other restrictions / notifications which may be relevant to historic uses or potential soil contamination are held against the property. Aside from notations relating to a number of easements on the site to convey water on the title for the Wakarara Road property and a Gazette Notice noting State Highway 50 adjoins the SH50 property there are no notes of interest contained on the titles. Copies of these documents are attached in Appendix B.

6.2 HISTORIC AERIAL PHOTOGRAPHS

Historic aerial photographs from 1952, 1965, 1972, 1980, 1996, and 1999 are available for the site on the Retrolens website, while recent images from 2018 and 2020 is available on the LINZ Data Service and Google Earth respectively. The findings of the historic aerial photograph review are summarised below, while copies of these aerial photographs have been attached in Appendix C.

- 1952-** The 1952 image is the earliest available image of the site, the plate only offers partial
1965 coverage of the southern half of the site, however the visible portions of the site are clearly under pastoral landuse at the time of the image.

A long gravel driveway provides access to a central yard area off State Highway 50 on the eastern boundary. The yard consists of a farmhouse with landscaped gardens surrounding, a small grouping of sheds to the northwest of the dwelling, a barn in the northwest extent of the yard and a second barn / shed in the northeast of the yard, this shed is surrounded by mature trees at the time of the image.

The 1965 image is of very poor quality and is overexposed making it difficult to discern individual features on the site, however, it appears that the site is in largely the same configuration at the time of the plate.

1972-1999 The 1972 plate is of higher quality and resolution making the sites features more easily discernible. At the time of the image the site remains in a similar configuration, being predominantly pastoral grazing with a central yard area comprising the majority of the site infrastructure. The driveway remains in place with the original dwelling, barn, and northeast shed remaining in place. Further sheds have been constructed / relocated on the western portion of the yard with a possible second, smaller dwelling and water tank constructed to the south of the barn in the NW corner of the yard. The trees surrounding the NE shed have largely been removed by the time of the image, a clear race infrastructure is noted to the east of the shed, the configuration of shed and races appears consistent with a spray race / sheep dip and woolshed. A new shed is also noted in the southwest of the site on the Wakarara Rd section.

Halfway between the yards' driveway and the southern corner of the site along SH50, a new residential dwelling has been constructed by the time of the 1972 plate while a further dwelling is constructed in the northern corner of the site, accessed off SH50 in the 1980 image. There are no further discernible developments on site in the 1980 image with the remaining areas of the site in the configuration described above.

While the 1996 image is again, of relatively poor quality, however it appears that the only discernible development on site is the removal of the original barn in the NW corner of the yard. The remaining site area remains in the same configuration with no discernible developments through the 1996 and 1999 plates.

2018-2020 The 2018 image is a higher quality colour image showing the site in largely the same configuration as previously described. The only notable developments are the construction of a holding pen and loading race to the south of the woolshed on the SH50 section and the construction of a new sorting race / holding pen adjacent to the original shed on the Wakarara Road section at the end of the driveway. Large numbers of polyethene wrapped hay bales are stored on the yard areas on both the SH50 and Wakarara Road yard areas indicating the continued pastoral grazing use for the site.

6.2.1 SUMMARY OF HISTORIC AERIAL PHOTOGRAPHS

GSL has reviewed the available historic aerial images of the site which show the site has a long history of pastoral farming, being maintained as predominantly vacant pasture for the entirety of its discernible history. While such farming activities are not themselves explicitly included on the MfE HAIL, a number of ancillary activities such as the presence of a potential sheep dip / spray race (HAIL Item A.8), farm refuse dumps, use of lead based paints and asbestos containing materials on historic structures (Item I), and the potential for the storage of fuels (Item A.17) and bulk storage of persistent pesticides or formulations relating to the operations of the sheep dip (Item A.10) may have been undertaken.

All of the potentially contaminating activities noted are centred around the yard area in the approximate centre of the site, there is no evidence of any actually or potentially contaminating landuse activities in the wider site area where only grazing activity is noted.

6.3 INTERVIEW WITH FORMER LANDOWNER

GSL personnel were put into contact with the former landowners Chas and Louise Chesterman who had utilised the State Highway 50 block for cattle and sheep farming activities since 1952 - 1953. Discussions with Chas Chesterman identified that a former sheep dip was present in the yard area adjacent to the woolshed although he had never seen it in operation. Mr Chesterman noted that the sheep dip had been filled with concrete prior to his purchase of the site, but that he understands the yard layout to have remained unchanged. Mr Chesterman noted that he had not made any distinct changes to the yard area adjacent to the wool shed and expected that this represented the previous layout.

On operations on the wider farm area, Mr Chesterman noted that all activities were consistent with general farming activities and beyond small scale storage of petrol and diesel for the operation of farm machinery, limited storage of any other potentially hazardous substances had occurred.

Mr Chesterman could not recall any wider information relating to actual or potential contamination on the site.

7 SITE INSPECTION AND INTERVIEW WITH THE LANDOWNER

GSL personnel undertook a site inspection and walkover for the purpose of collecting soil samples on 17 March 2021. At the time of the inspection, weather was fine and clear and the full extent of the site was accessible. GSL personnel meet with Simon Ellmers on site who confirmed that the and had been recently purchased and beyond the farm dump adjacent to the former barn and the evidence of the sheep dip, the site history was largely as gleaned from the above historical information. It was noted that the newly erected Wakarara Road block had hardly been used as Mr Foley who owned that block had leased the wider SH50 Block from the Chesterman's so the yards on the SH50 block had been the primary point of use for modern activities. It was noted were three offal holes on the property, two of which had not been used in some time and the third 'offal hole' which corresponds to the farm dump within same paddocks as the old sheds. As far as the current owners are aware, the farmland was utilised for beef and lamb fattening with limited intermittent use for seed and fodder crops.

7.1 GSL OBSERVATIONS

At the time of the inspection, the site layout is consistent with that detailed in the most recent aerial imagery and can effectively be grouped into four components:

1. Residential dwellings and curtilages accessed of State Highway 50;
2. State Highway 50 woolshed and associated yards, sheds and farm dump;
3. Wakarara Road Yards and shed; and
4. Wider pasture paddock areas.

Site photographs are included in Appendix D and each of these areas is detailed in turn below.

7.1.1 RESIDENTIAL DWELLINGS AND CURTILAGES

Two residential dwellings are present within the piece of land under investigation, both accessed directly off State Highway 50. The southern most of the two dwellings is a plaster render finish with

brick accents and corrugated iron roof. A large garage is attached with a small secondary detached shed present on the edge of the curtilage. Ornamental gardens surround the full extent and a slight change in level exists at the front adjacent to the stream bed. Ornamental plantings are varied and include large specimen trees. Portions of the dwelling were identified as potentially asbestos containing materials (soffits etc) but all were in good well painted condition and no evidence of any potential discharge was observed.

The northern most dwelling is a smaller brick veneer construction with portions of shadowline fibre cement cladding. A two-bay garage separate to the dwelling is located in the northern corner of the curtilage and is also clad in shadowline fibre cement products. Again, the curtilage was well maintained ornamental gardens with a shelterbelt running along the north western boundary to provide separation from the farmland. Again, while potential asbestos containing materials were observed in the construction, no evidence of any degradation was present that would present a risk of soil contamination.

Both residential dwellings appear to be serviced by onsite wastewater systems with vents observed in both house curtilages. The age and nature of the vents suggest that these systems are old simple concrete settlement systems with a liquid overflow / discharge line present.

7.1.2 STATE HIGHWAY 50 WOOLSHED, YARDS AND SHEDS

Access to the yard areas and main clusters of farm buildings is provided via a long gravel driveway from State Highway 50 travelling northwest into the approximate centre of the site. The first structure present is a modern cattle yard constructed with a simple shelter and a set of scales. The yard is of more modern construction, and while slightly aged, likely to have been built in the 1990's. These yards attach via medium sized pens to the smaller pens attached to the wool shed, sorting race and likely former sheep dip location. Remedial construction has been undertaken on these pens to replace and modernise the timber, however aged indications such as weathered concrete posts still remain to suggest it is an older structure. The Central part of these yards has a concrete lined sorting race with concrete clearly visible in three different ages suggesting that a central spray race or dip was filled at some point in the site's history, and prior to 1952 based on discussions with current and former site owners.

The outer layer of concrete on the western edge was observed to contain a drainage point suggesting that this layer was the original dip / spray race. The yards themselves have a mixed gravel surface with a thin layer of topsoil before progressing into alluvial cobbles.

To the northwest of the dip location, the original woolshed remains in place. At the time of the inspection, the current owners had engaged a builder to undertake remedial works on the foundations of the woolshed which had suffered borer and rot damage over time. The wooden cladding on the woolshed was well aged and some evidence of paint discharge was present, suggesting that lead based paint discharge may have impacted soil in the immediate curtilage of the woolshed.

Further to the west of the woolshed lies the main cluster of farm buildings and farm dump itself. The buildings are spread out across a significant area and are primarily of wooden construction of varying ages. Two of the buildings in the centre which are consistent with domestic single garage size are founded on concrete foundations with most of the remainder formed via pole barn style construction directly over the dirt. All buildings were observed to be in varying states of repair with

most in average condition and several in poor, derelict condition. A new modern pumphouse had been constructed on the south eastern edge of the main building layout.

In the north western corner of this cluster of buildings a moderate sized farm dump was observed to have been established within an apparent gravel borrow pit. Materials within the farm dump were observed to be a mix of tree stumps and branches, plastics, corrugated iron, wood fencing wire and some miscellaneous household products (lawnmower catcher, old speaker etc). The dump was overgrown with blackberry and weeds so a full assessment of depth and materials within the deeper layers could not be made.

Two empty above ground storage tanks were observed adjacent to the rear one of the sheds present in the centre of this area. Both tanks appeared in sound condition with no evidence of leaks or spills was observed at ground level or within the soil samples collected at those locations. A third tank was located slightly south west on a concrete plinth which appeared more modern and while empty, likely recent in service suggesting that the older two tanks may have been removed from this position and replaced.

On the south western edge of the main cluster of buildings, soil / gravel bunds were observed adjacent to the residual pine trees in this area. These appeared to have been locally sourced during construction of the yard areas on site and no evidence of any foreign materials was encountered.

The southern edge of this main cluster of buildings is the location of the original dwelling which was removed some time prior to 1980. A concrete structure remains on the edge of this footprint, utilised currently as an animal shelter, but it is not clear if this was part of the former dwelling. The ground area in the location of the former dwelling was largely barren on account of the dry summer conditions and lack of topsoil present. The exposed surface was dominated with cobbles and minor inclusions of brick were observed.

7.1.3 WAKARARA ROAD YARDS AND SHED

A separate driveway is located at 612 Wakarara Road that leads between two rural residential style properties down to a large simple open haybarn / shelter and a modern set of yards. Timber and concrete was observed to be excellent condition confirming very recent construction of the yards. The hay barn / shelter building was of slightly older construction, with corrugated iron utilised on the roof and rear wall of the building and shorter cladding on the walls forming a fenceline edge. Support poles were steel while roof bearers were treated timber.

A small pile of treated timber posts had been placed adjacent tot the barn shelter as part of ongoing farm repairs.

Aside from the incised ephemeral stream / flood path just to the north east of the shed and yards, there were no other features of note in this area.

7.1.4 WIDER PASTURE PADDOCKS

The bulk of the sites 214 Ha size was maintained under pasture grass at the time of the inspection. Two paddocks on the Wakarara Road edge had been tilled and reseeded with grass ready for the autumn and following spring seasons while all other areas were under grass. Beef cattle was being grazed across a portion of the site and mature shelterbelt trees were present in some locations.

On the south eastern edge, clearance works had been undertaken to fell a large shelter belt of conifers and a bulldozer utilised to remove the tree stumps.

All paddocks appeared in similar condition and aside from the dry summer conditions, no evidence of vegetative stress or contamination was encountered.

8 CONCEPTUAL MODEL OF POTENTIAL CONTAMINATION

Based on the findings of the above desktop investigation and site inspection, GSL considers that the piece of land has been subject to a range of HAIL activities associated with normal farming practices extending more than 60 years on site. Those activities can be summarised as:

- Operation of a sheep dip / spray race - HAIL Item A.8
 - Contaminants of concern - arsenic and organochlorine pesticides
- Potential use of lead based paints - HAIL Item I where risk to human health is present only
 - Contaminants of concern - lead only
- Farm dump - HAIL Item G.3
 - Contaminants of concern - heavy metals and polycyclic aromatic hydrocarbons used as indicative of any potential impacts or risks to human / environmental health.
- Storage Drums for Fuel – HAIL Item A.17
 - Contaminants of Concern
- Onsite wastewater discharges to Land – HAIL Item G.5
 - Contaminants of concern – heavy metals used as an indicator of potential risks to human / environmental health.

Each of these is discussed further below in terms of contamination risk and expected spatial distribution of contaminants.

8.1 OPERATION OF SHEEP DIP / SPRAY RACE

As identified in the historic aerial images, and confirmed in the site inspection, a sheep dip / spray race is highly likely to have been operated on the site. The primary risks of discharges to soil are:

- Wet sheep leaving the dip and dripping to surrounding soil surfaces;
- Splash spillage from sheep during the dipping process; and / or
- Spillage from top up of dip chemicals, mixing of formulations, and drainage of the dip / spray race.

8.1.1 EXPECTED SPATIAL DISTRIBUTION

The discharge of sheep dip chemicals from wet sheep within a holding pen would likely result in a largely uniform fan pattern of discharge with concentrations highest at the egress point from the dip where wet sheep leave and their wettest, before dissipating with distance from the source as the excess dip chemicals gradually drip off. Movement of numerous sheep throughout the dip process would likely present a uniform discharge on account of transfer from large volumes of animals at the exit point and provide a plume pattern as the wet sheep dry out.

In contrast both splash spillage and spillage from top up of chemicals alongside drainage of the dip / race would result in hotspot contamination concentrated at the location of the sheep dip.

Where these activities were occurring on concrete surfaces noted in the race itself, dip chemicals would run and concentrate along the edges of the slab or within drains and discharge points. The impermeable nature of concrete means that no distinct discharge under those surfaces would be expected provided it remained in sound condition for the duration of operations.

Given the proximity of the woolshed, it is likely that this would be the primary storage location of any raw formulations with mixing and transfer occurring within the immediate vicinity for ease of operations.

In terms of both uniform and hotspot discharges to soil, impacts to soil would be expected to accumulate within the surficial soil layer and attenuate rapidly with depth and distance from source.

The priority contaminants of concern associated with sheep dip activities are arsenic and organochlorine pesticides.

8.2 DISCHARGE OF LEAD BASED PAINT FROM HISTORIC STRUCTURES

Lead based paints on exterior surfaces can infiltrate the surrounding soil when painted surfaces are in deteriorated or flaking condition, or during routine maintenance such as scraping or sanding if insufficient ground protection is utilised.

8.2.1 EXPECTED SPATIAL DISTRIBUTION

As a result of the discharge of lead-based paint flakes / dust over time, lead concentrations can be elevated in the immediate area surrounding the structure with concentrations rapidly attenuating to background concentrations with both lateral distance and depth from the source. The potential impact of lead-based paint discharge can be regarded as a tightly constrained circular hotspot surrounding the structure, in GSL 's experience, background concentrations are generally reached within 3-5 m of the structure and within 300 mm depth from the surface within the hotspot.

8.3 FARM DUMP

Given the rural nature of farming activities, combined with the lack of municipal refuse collections the practise of small-scale landfilling of general refuse is common in the form of farm dumps. Farm dumps can be very mixed in composition and may include general domestic wastes, waste generated by farming activities (empty containers / structural timbers or building products, sometimes end of life machinery or appliances), as such a large range of potential contaminants of concern can be present as a result farm dumping activities. The composition observed was a mix of treated and untreated timbers, corrugated iron, fencing wire, plastics, low levels of household materials and vegetation. The overgrown nature prevented a definitive assessment being made at the time of inspection and it was elected not to disturb further without remediation. Materials at surface had not degraded.

8.3.1 EXPECTED SPATIAL DISTRIBUTION

While the composition of material within the farm dump can result in a heterogeneous distribution of potential contaminants within the farm dump, the material is relatively well constrained to the area of the dump itself. Any discharge from waste materials would likely be as a result of interactions with rainwater infiltration or groundwater interactions, it is likely that any potential impacts of the farm dump would be well constrained to the footprint of the dump itself. Lateral spread of potential contamination is unlikely, while some impacts may be observed underlying the dump as a result of diffuse rainwater / groundwater (if any) interactions.

8.4 INTRUSIVE INVESTIGATION REQUIREMENTS

In order to assess the conceptual site model for potential contamination above, where the majority of the potential sources of contamination are point sources likely to result in the generation of hotspots, a judgemental, targeted soil sampling regime is appropriate.

Under the requirements of the contaminated land management guidelines, a potentially impacted area of the size of the yard (approximately 4 Ha) would normally require samples taken from a minimum of 50 soil samples on a systematic grid based sampling approach to fully characterise the site for potential hotspot contamination where hotspots of approximately 30 m² are expected. Given the distribution of buildings and structures, a targeted soil sampling regime was implemented in and around the buildings and structures that might represent hotspots of contamination.

9 SOIL SAMPLING AND ANALYSIS

To investigate the soil quality across the yard area, GSL personnel collected discrete soil samples from 51 locations around the areas of former and remaining structures where lead based paint may have been used, and in high risk areas around the sheep dip.

Soil samples were collected from the top 150 mm of topsoil by means of a stainless-steel hand auger and transferred directly into laboratory provided glass jars (where PAH analysis is required) or resealable plastic bags for heavy metals and organochlorine pesticides were the contaminants of concern. Sampling equipment was decontaminated between each sample in accordance with GSL internal quality control procedures. A brief sample description was recorded in the field at the time of sample collection. Each soil sample was labelled with the date, sample identification number, location, and initials of sampler noted on the bag.

As noted in the conceptual model above, Contaminated Land Management Guidelines require the collection of soil samples from approximately 50 locations for an area the size of the yard (some 4 Ha), therefore the sampling protocol followed was in direct accordance with the *'Contaminated Land Management Guidelines (CLMG) No. 5 – Site Investigation and Analysis of Soils'*. The soil sampling rationale that was followed is described below while the soil sample locations are shown in Figure 2 and Figure 3, and site photographs are attached in Appendix D.

Soil Sample No.	Location	Indicated Laboratory Analysis	Analytical Results
SS1-SS12, SS16 and SS17	Sheep dip, woolshed and potential run out areas	Arsenic, copper, lead and OCPs	Table 2
SS22	Within footprint of former barn	Arsenic, copper, lead, and OCPs	Table 2
SS13-SS15, SS18-SS21, SS23-SS30, SS32, and SS37-SS49	Around pre-1952 structures on site where lead based paint is potentially used	Lead only	Table 4
SS31, SS33, and SS34, SS50 & SS51	Area around above ground fuel tanks and areas that may have been subject to refuelling	Heavy metals and PAH	Table 3

Notes:

1. PAHs = polycyclic aromatic hydrocarbons, OCPs = organochlorine pesticides

9.1 LABORATORY ANALYSIS AND QUALITY CONTROL

Sample bags and jars were placed in a chilly bin packed with ice with a chain of custody form (COC) indicating the analysis to be performed. Soil samples were dispatched to Analytica Laboratories in Hamilton for analysis of the contaminants of concern as documented above.

Analytica Laboratories are accredited by International Accreditation New Zealand (IANZ) for the analysis undertaken.

9.2 ACCEPTANCE CRITERIA AND RELEVANT GUIDELINES

The NES mandates fourteen soil contaminant standards (SCS) for the protection of human health for organic compounds and inorganic elements for various landuse criteria. The NES human health SCS criteria for rural residential landuse have been applied to the proposed change in landuse, subdivision, and development.

The Hawke's Bay Region and Central Hawke's Bay District Council do not define guideline values for the protection of environmental, delegating the assessment of contaminants to the national level by means of the NES soil contaminant standards for the protection of human health. As such, to give an indication of potential risk to environmental health from inorganic elements and persistent pesticides, the results have been compared to the Draft Evo-SGVs defined by Landcare Research in their Contract Report LC2595 *User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs) – Consultation Draft* (2016).

Results are also compared to the background concentration ranges of inorganic elements in soils in the Hawke's Bay region prepared by Landcare Research in their Contract Report LC1852 for Hawke's Bay Regional Council in Report no. *RM14-03, HBRC plan no. 4611, Hawke's Bay Region: Background Soil concentrations for managing soil quality* (2014)

10 ANALYTICAL RESULTS

A comparison of the analytical results with the relevant guideline criteria is provided in Table 1 and Table 2 below. Copies of the laboratory chain of custody document (COC) and analytical transcripts are attached in Appendix E, while a discussion of the results is provided below. Beyond DDT and Dieldrin, no other OCPs were detected in any of the soil samples and have subsequently been omitted from the table of results.

Table 2: Sheep Dip and Former Barn Analytical Results¹

	Arsenic	Copper	Lead	ΣDDT ⁵	Dieldrin
SS1	12	29.7	26.3	ND	<0.05
SS2	15.7	46.5	17.5	ND	0.06
SS3	16.9	34.4	17.7	ND	0.08
SS4	5.3	17.7	12.8	ND	<0.05
SS5	23.0	36.3	15.3	ND	<0.05
SS6	23.2	38.3	18.9	0.02	0.16
SS7	138	41.8	19.9	0.008	0.09
SS8	76.9	26.6	13.6	ND	<0.05
SS9	13.3	31.1	15.5	0.013	0.07
SS10	11	20.4	12.1	ND	<0.05
SS11	30.8	24.9	17.3	0.007	<0.05
SS12	5.5	19.0	11.4	ND	<0.05
SS16	901	198	19.2	ND	<0.05
SS17	382	138	38.0	ND	0.14
SS22	63.4	25.7	86.6	0.009	<0.05
NES ²	17	>10,000	160	45	1.1
Eco-SGV ³	60	240	3,000	1.1	0.7 ⁶
Background ⁴	12.08	42.85	44.34	ND	ND

Notes:

1. All concentrations measured in mg/kg.
2. National Environmental Standards (NES) for assessing and managing contaminants in soil to protect human health – commercial / industrial outdoor worker (unpaved).
3. Landcare Research (2016) User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs);
4. Landcare Research (2014) Hawke's Bay Region: Background soil concentrations for managing soil quality.
5. Values in **BOLD** exceed the NES criteria, values in **BOLD** exceed the Eco-SGV criteria, Values in **BOLD** exceed the Background Ranges.
6. NA = Not applicable / NL = No Limit / ND= not detected

10.1 SHEEP DIP AND BARN DISCUSSION

Elevated concentrations of arsenic above the expected background concentrations have been recorded in fifteen of the eighteen soil samples submitted for analysis. Of those fifteen samples, eight soil samples exceeded the NES Rural Residential SCS. Highest concentrations were recorded on the south and eastern sides of former dip, corresponding to the topography in this location.

Trace detections of Σ DDT and Dieldrin were recorded in eight of the eighteen soil samples analysed suggesting that the primary risks are related to arsenic based dips only.

Table 3: Fuel Storage Area Heavy Metal and PAH Results¹

	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	BaP
SS31	22.3	0.726	19.5	20.6	1,610	8.22	1,440	0.03
SS33	14.9	0.609	27.1	58.2	178	14.7	502	ND
SS34	14.9	1.55	22.8	33.1	185	52.2	413	ND
SS50	9.1	0.45	16.0	19.9	93.8	14.2	322	ND
SS51	8.3	0.21	18.1	20.8	23.2	8.07	129	ND
NES	17	0.8	290	>10,000	160	NL	NL	6
Eco-SGV	60	12	390	240	900		300	22
Background	12.08	0.34	80.15	42.85	44.34	44.96	182.8	ND

Notes:

1. All concentrations measured in mg/kg;
2. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand - Tier 1 Soil acceptance criteria for commercial / industrial landuse, sandy soils <1.0 m;
3. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand - Soil acceptance criteria for protection of groundwater, sandy soils <1.0 m, depth to GW 2m
4. National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health – commercial / industrial outdoor worker (unpaved);
5. Values in **BOLD** exceed the human health criteria, values in **BOLD** exceed the groundwater protection criteria, values in **BOLD** exceed the background range;
6. NA indicates contaminant not limiting as estimated health-based criteria is significantly higher than that likely to be encountered on site, i.e. >20,000 mg/kg, separate phase hydrocarbons likely to be present in soil matrix to present a risk.
7. ND = not detected

10.2 HEAVY METAL AND PAH DISCUSSIONS

Soil samples collected in the vicinity of the above ground tanks revealed elevated concentrations of heavy metals in excess of the expected naturally occurring background ranges with concentrations of lead and arsenic in four soil sample exceeding the NES SCS for Rural Residential landuse and concentrations of zinc in three soil samples exceeding the Eco-SGV threshold for sensitive soil receptors.

Trace concentrations of BaP were recorded in one of the soil samples assessed only.

Table 4: Lead Analytical Results¹

	Lead		Lead		Lead
SS13	348	SS27	34.1	SS41	1,190
SS14	158	SS28	52.3	SS42	4,240
SS15	82.0	SS29	31.4	SS43	2,770
SS18	27.6	SS30	281	SS44	66.2
SS19	91.9	SS32	6,410	SS45	729
SS20	19.3	SS35	92.3	SS46	269
SS21	37.1	SS36	55.1	SS47	128
SS23	626	SS37	14.7	SS48	83.6
SS24	190	SS38	20.9	SS49	22.9
SS25	99.6	SS39	27.4		
SS26	230	SS40	43.9		
NES	160	NES	160	NES	160
Eco-SGV	900	Eco-SGV	900	Eco-SGV	900
Background	44.34	Background	44.34	Background	44.34

Notes:

1. All concentrations measured in mg/kg.
2. National Environmental Standards (NES) for assessing and managing contaminants in soil to protect human health – commercial / industrial outdoor worker (unpaved).
3. Landcare Research (2016) User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs);
4. Landcare Research (2014) Hawke's Bay Region: Background soil concentrations for managing soil quality.
5. Values in **BOLD** exceed the NES criteria, values in **BOLD** exceed the Eco-SGV criteria, Values in **BOLD** exceed the Background Ranges.
6. NA = Not applicable / NL = No Limit / ND= not detected

10.3 LEAD DISCUSSION

Of the 31 soil samples submitted for analysis of lead in and around old buildings and structures, eleven soil samples returned elevated concentrations of lead exceeding the NES SCS for rural residential landuse and four exceed the Eco SGV threshold for the protection of sensitive environmental receptors.

An additional ten soil samples returned concentrations of lead in excess of the expected naturally occurring background range.

11 EXTENT OF ACTUALLY AND POTENTIALLY IMPACTED AREAS

Based on the findings of this investigation, GSL has confirmed that HAIL activities have resulted in adverse impacts to soil quality and the following areas will require remedial action:

- Areas surrounding the oldest sheds and former residential dwelling have been impacted by lead to a level that exceeds the NES Rural Residential land use standard;
- The curtilage of the wool shed has been adversely impacted by lead to a distance not exceeding 3m;
- Sheep dip activities have resulted in elevated concentrations of arsenic and the eastern and southern extents of historic dip structure;
- A residual farm dump is present encompassing an area of approximately 100m with mixed refuse present within the void. The exact depth is unknown on account of the overgrown vegetation and age but is likely to extend approximately 5m below relative ground level; and
- Domestic wastewater systems attached to the dwellings have been identified and are considered low risk. However, should these require decommissioning and removal during demolition activities, appropriate controls should be in place and effective.

The estimated extents of impacts are shown on Figures 4 and 5 while recommendations are set out in Section 13 below.

12 CONCLUSIONS

In order to inform on the requirements of the NES, RRMP and CHBDP with respect to actual and potential contamination, GSL conducted a detailed site investigation in accordance with the MfE Contaminated Land Management Guidelines. Assessment of site history has identified that the piece of land has been utilised for dry stock beef and sheep raising for at least the last 60 years. Activities on site have been consistent with the expectations of general farming and as a result, the following HAIL Activities were identified:

- Operation of a sheep dip / spray race - HAIL Item A.8;
- Potential use of lead based paints - HAIL Item I where risk to human health is present only;
- Farm dump - HAIL Item G.3;
- Storage Drums for Fuel – HAIL Item A.17; and
- Onsite wastewater discharges to Land – HAIL Item G.5.

Intrusive soil sampling in and around the main farming structures was completed to assess any potential discharges from the former sheep dip, fuel storage and of lead based paint to soil. Intrusive investigation identified that discrete areas of the site have been adversely impacted to a degree that exceeds the Rural Residential SCS and in some instances the Eco SGV thresholds for the protection of sensitive environmental receptors. Consequently, remediation will be required to make the piece of land fit for the proposed subdivision and change in land use. A draft Remediation Action Plan has been prepared alongside this DSI to document those recommendations.

12.1 THE NATIONAL ENVIRONMENTAL STANDARDS (NES)

On account of the identification of priority contaminants in excess of the expected naturally occurring background ranges, and in excess of the applicable Soil Contaminant Standard within a portion of the site, the Regulations of the NES are applicable to the proposed subdivision and development. Consequently, the proposal will be considered a Restricted Discretionary activity under Regulation 10. Given the findings of this DSI, it is recommended that conditions be included to ensure:

- Supplementary delineation soil sampling is completed as set out in the accompanying Draft Remediation Action Plan to confirm the lateral and vertical extents of impacted soil and submitted to Council for assessment;
- The Draft RAP is updated and submitted to Council for approval to take into account the findings of the delineation soil sampling and confirmed remedial methodologies; and
- Upon completion of all required remediation, a site validation report is compiled to certify that all remedial works were completed in accordance with the Council approved Remediation Action Plan and all residual soils now meet the stipulated remedial goals.

12.2 HAWKE'S BAY RRMP

Discrete soil samples have returned analytical results in excess of the adopted values for Environmental Protection of sensitive receptors and isolated concentrations have been recorded at values that are considered a potential discharge risk. Consequently, the proposed activity does not meet the permitted activity rule under Rule 48 of the RRMP and a short term discharge consent will likely be required as a Discretionary activity under Rule 52 of the RRMP to facilitate remedial earthworks on site.

12.3 CHBDP

The District Plan for Central Hawke's Bay is a first generation plan that pre-dates the NES and does not contain any specific parameters regarding soil contamination. Therefore, assessment under the NES is sufficient to address District Plan jurisdictions.

13 RECOMMENDATIONS

Remedial actions will be required to address the extent of impacted areas identified on Figure 4 to ensure that the piece of land identified as being adversely impacted by former HAIL activities is made fit for purpose. GSL recommends:

- Delineation soil sampling be undertaken across the areas adversely impacted to determine the lateral and vertical extent of any impacted soils as follows:
 - Grid based soil sampling using cardinal delineation points around the areas of identified lead impacts in the central yard portion of the site;
 - Expanding ring sampling to the south and east of the sheep dip to confirm the full extent of plume discharge beyond SS17 and SS11 alongside further depth soil sampling to confirm the extent;

- Submission of an updated Remediation Action Plan to Council prior to any remedial works commencing on site;
- In the event of demolition and removal of the existing residences, commissioning of Hazardous building material surveys on the residential dwellings to identify the full extent of any asbestos containing materials present and allow for licensed removal where required prior to any demolition occurring in accordance with the Health and Safety at Work (Asbestos) Regulations 2016;
- Decommissioning and removal of onsite wastewater treatment systems in accordance with the recommendations of the Draft RAP where these are no longer required; and
- Site Validation inspections, sampling and reporting as necessary to confirm that impacted soils have been appropriately remediated and managed in accordance with the Council approved Remediation Action Plan and all residual soils are fit for the proposed end rural residential land use standard.

14 REFERENCES

1. Ministry for the Environment (2003) — *Contaminated Land Management Guidelines No.1: Reporting on contaminated Sites in New Zealand*. Ministry for the Environment, Wellington, New Zealand.
2. Ministry for the Environment (2003) — *Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils*. Ministry for the Environment, Wellington, New Zealand.
3. Ministry for the Environment (2012) - *Users Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*. Ministry for the Environment, Wellington, New Zealand.
4. Ministry for the Environment (2011) – *Methodology for Deriving Standards for contaminants in Soil to Protect Human Health*. Ministry for the Environment, Wellington, New Zealand.
5. Landcare Resuearch (2016) – *User Guide: Background soil concentrations and soil guideline values for the protection of ecological receptors (Eco-SGVs) – Consultant Draft*. Landcare Research. Gerald Street, Lincoln, New Zealand.
6. Auckland Council (2013) –*Auckland Unitary Plan (Operative in Part)*, Auckland, New Zealand.
7. Landcare Research (2014) – *Hawke’s Bay Region: Background soil concentrations for managing soil quality, Report no. RM 14-03, HBRC plan no. 4611*. Hawkes Bay Regional Council, 159 Dalton Street, Napier, New Zealand.
8. Kingma, J.T. (1971) — *Geological Map of the Te Atute subdivision, New Zealand Geological Survey Bulletin 70, 2 Sheets +173*.
9. Ministry for the Environment (rev 2011) - *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand*. Ministry for the Environment, Wellington, New Zealand.

15 LIMITATIONS

The conclusions and all information in this Report are given strictly in accordance with and subject to the following limitations and recommendations:

1. The assessment undertaken to form this conclusion is limited to the scope of work agreed between GSL and the client, or the client's agent as outlined in this Report. This report has been prepared for the sole benefit of the client and neither the whole nor any part of this report may be used or relied upon by any other party except for territorial authorities in their duties under the Resource Management Act 1991.
2. The investigations carried out for the purposes of the report have been undertaken, and the report has been prepared, in accordance with normal prudent practice and by reference to applicable environmental regulatory authority and industry standards, guidelines and assessment criteria in existence at the date of this report.
3. This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by GSL for use of any part of this report in any other context.
4. This Report was prepared on the dates and times as referenced in the report and is based on the conditions encountered on the site and information reviewed during the time of preparation. GSL accepts no responsibility for any changes in site conditions or in the information reviewed that have occurred after this period of time.
5. Where this report indicates that information has been provided to GSL by third parties, GSL has made no independent verification of this information except as expressly stated in the report. GSL assumes no liability for any inaccuracies in or omissions to that information.
6. Given the limited Scope of Works, GSL has only assessed the potential for contamination resulting from past and current known uses of the site.
7. Environmental studies identify actual sub-surface conditions only at those points where samples are taken and when they are taken. Actual conditions between sampling locations or differ from those inferred. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from that predicted. Nothing can be done to prevent the unanticipated and GSL does not guarantee that contamination does not exist at the site.
8. Except as otherwise specifically stated in this report, GSL makes no warranty or representation as to the presence or otherwise of asbestos and/or asbestos containing materials ("ACM") on the site. If fill has been imported on to the site at any time, or if any buildings constructed prior to 1970 have been demolished on the site or materials from such buildings disposed of on the site, the site may contain asbestos or ACM.
9. No investigations have been undertaken into any off-site conditions, or whether any adjoining sites may have been impacted by contamination or other conditions originating from this site. The conclusion set out above is based solely on the information and findings contained in this report.
10. Except as specifically stated above, GSL makes no warranty, statement or representation of any kind concerning the suitability of the site for any purpose or the permissibility of any use, development or re-development of the site.
11. The investigation and remediation of contaminated sites is a field in which legislation and interpretation of legislation is changing rapidly. Our interpretation of the investigation findings should not be taken to be that of any other party. When approval from a statutory authority is required for a project, that approval should be directly sought by the client.
12. Use, development or re-development of the site for any purpose may require planning and other approvals and, in some cases, environmental regulatory authority and accredited site auditor approvals. GSL offers no opinion as to whether the current use has any or all approvals required, is operating in accordance with any approvals, the likelihood of obtaining any approvals, or the conditions and obligations which such approvals may impose, which may include the requirement for additional environmental works.
13. GSL makes no determination or recommendation regarding a decision to provide or not to provide financing with respect to the site. The on-going use of the site and/or use of the site for any different purpose may require the owner/user to manage and/or remediate site conditions, such as contamination and other conditions, including but not limited to conditions referred to in this report.
14. Except as required by law, no third party may use, or rely on, this report unless otherwise agreed by GSL in writing. Where such agreement is provided, GSL will provide a letter of reliance to the agreed third party in the form required by GSL.
15. To the extent permitted by law, GSL expressly disclaims and excludes liability for any loss, damage, cost or expenses suffered by any third party relating to or resulting from the use of, or reliance on, any information contained in this Report. GSL does not admit that any action, liability or claim may exist or be available to any third party.
16. Except as specifically stated in this section, GSL does not authorise the use of this report by any third party.

FIGURES

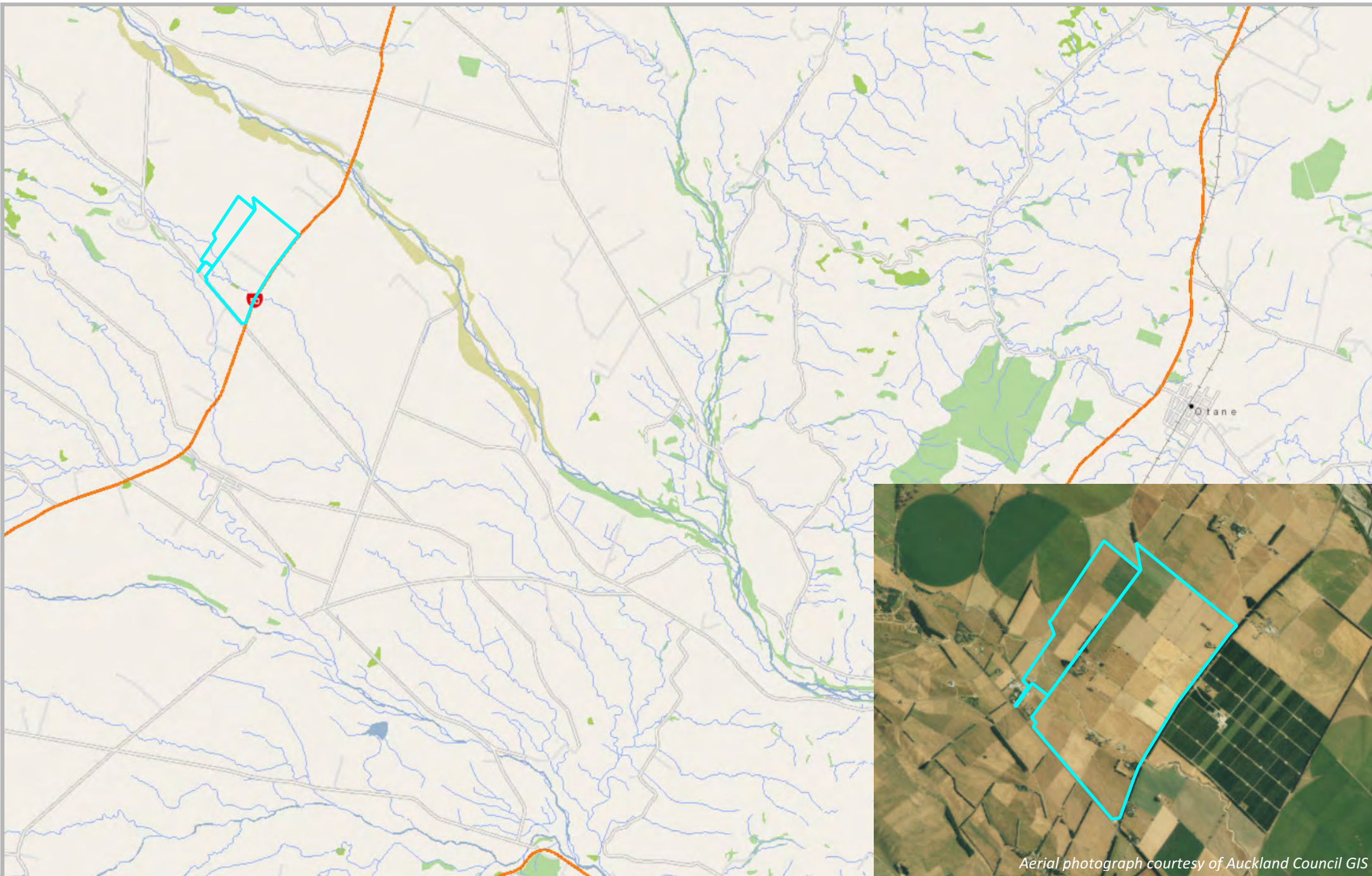


Figure 1 - Site Locality
Wakarara Rd & SH50, Onga Onga







Aerial photograph courtesy of LINZ

Figure 2 - Yard Infrastructure
Wakarara Rd & SH50, Onga Onga

Legend:

JH0151 - Soil Sample Locations

-  < Background
-  > Background
-  > Eco-SGV
-  > NES




Aerial photograph courtesy of LINZ

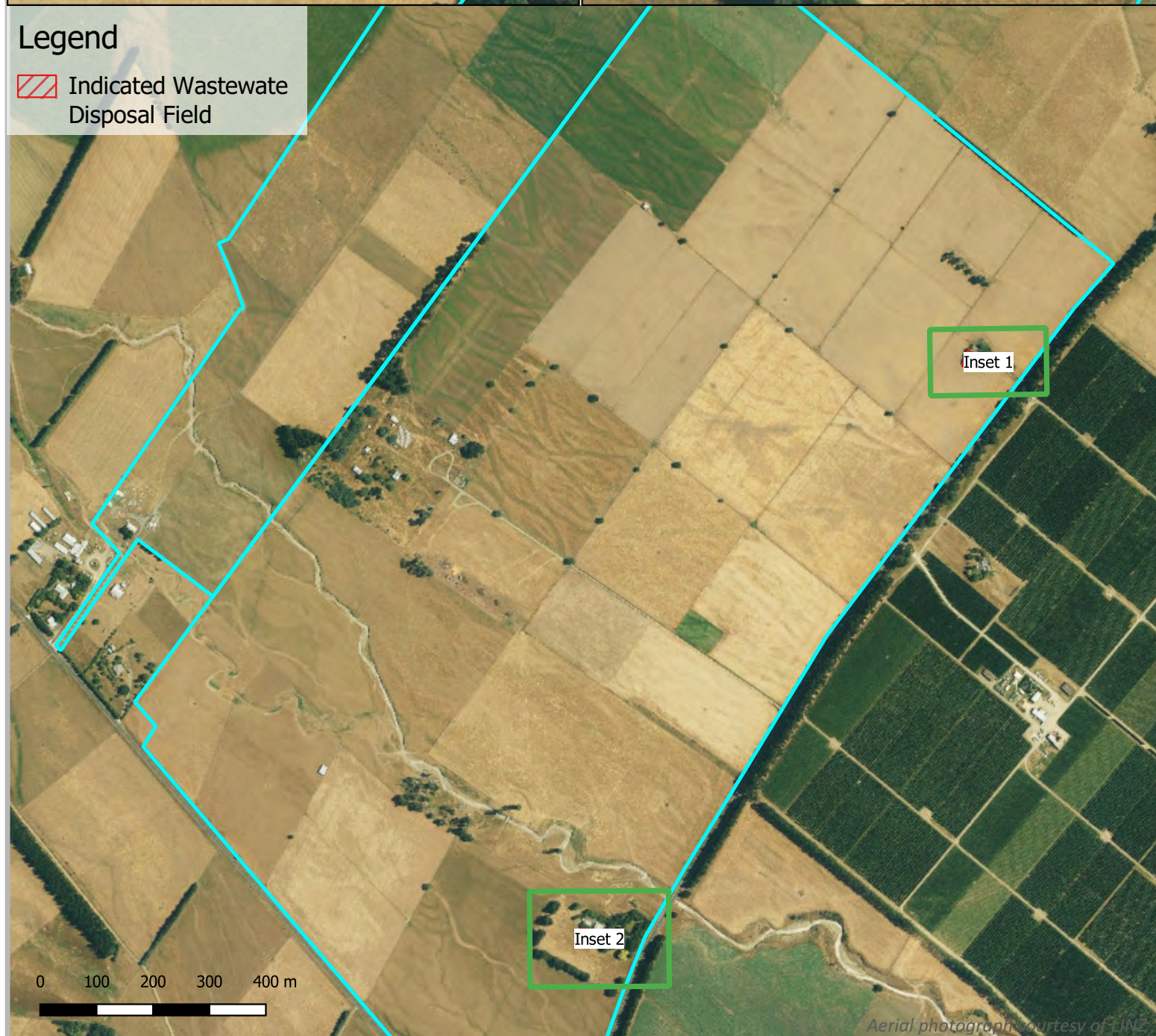


Aerial photograph courtesy of LINZ



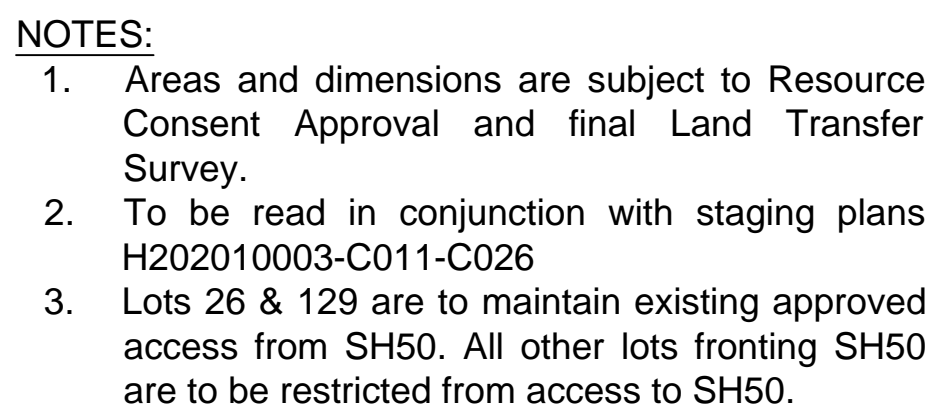
Legend

 Indicated Wastewater Disposal Field

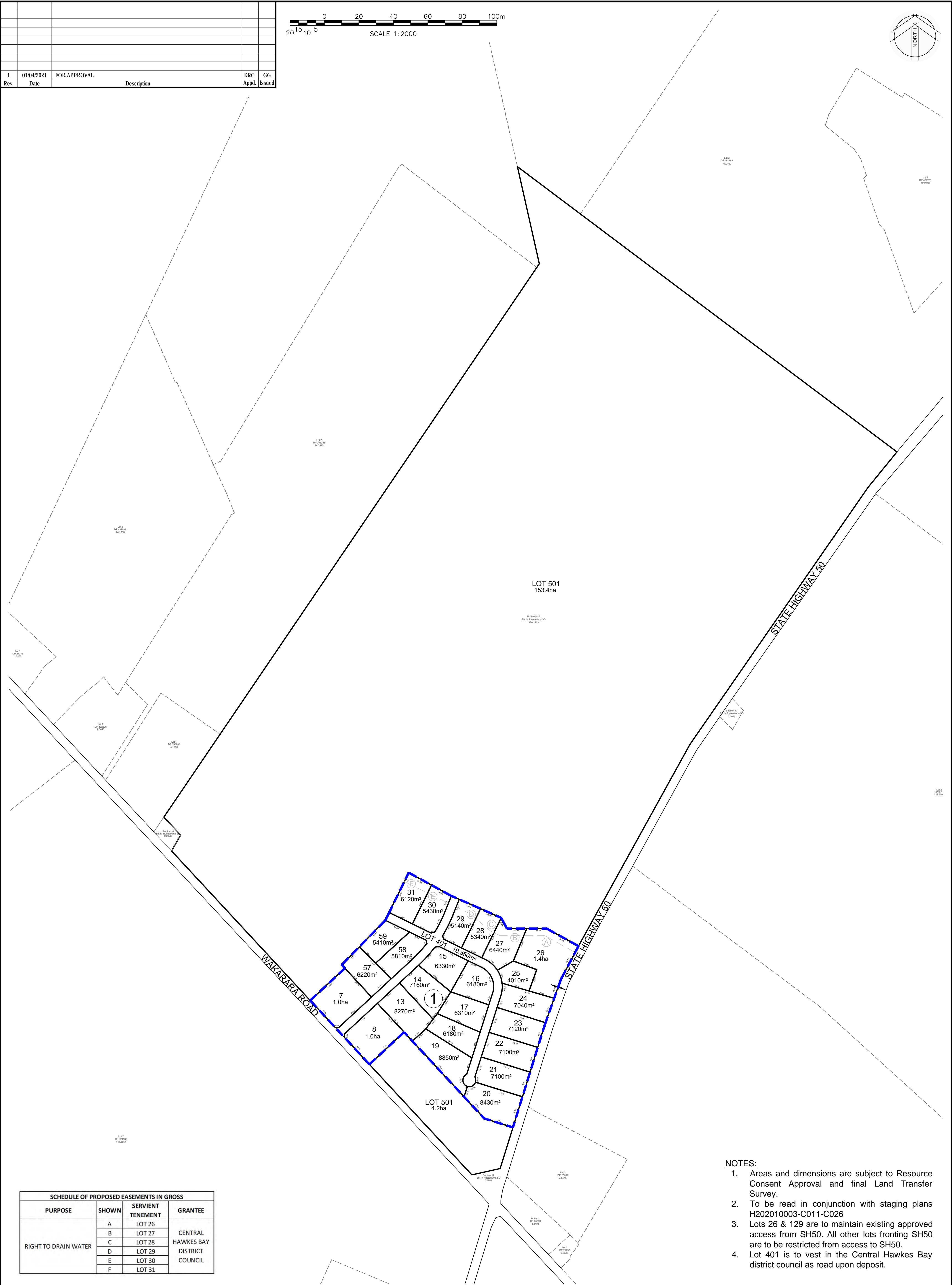


Aerial photograph courtesy of LINZ

APPENDIX A PROPOSED SCHEME PLAN



SCHEDULE OF PROPOSED EASEMENTS IN GROSS			
PURPOSE	SHOWN	SERVIENT TENEMENT	GRANTEE
RIGHT TO DRAIN WATER	A	LOT 26	CENTRAL HAWKES BAY DISTRICT COUNCIL
	B	LOT 27	
	C	LOT 28	
	D	LOT 29	
	E	LOT 30	
	F	LOT 31	

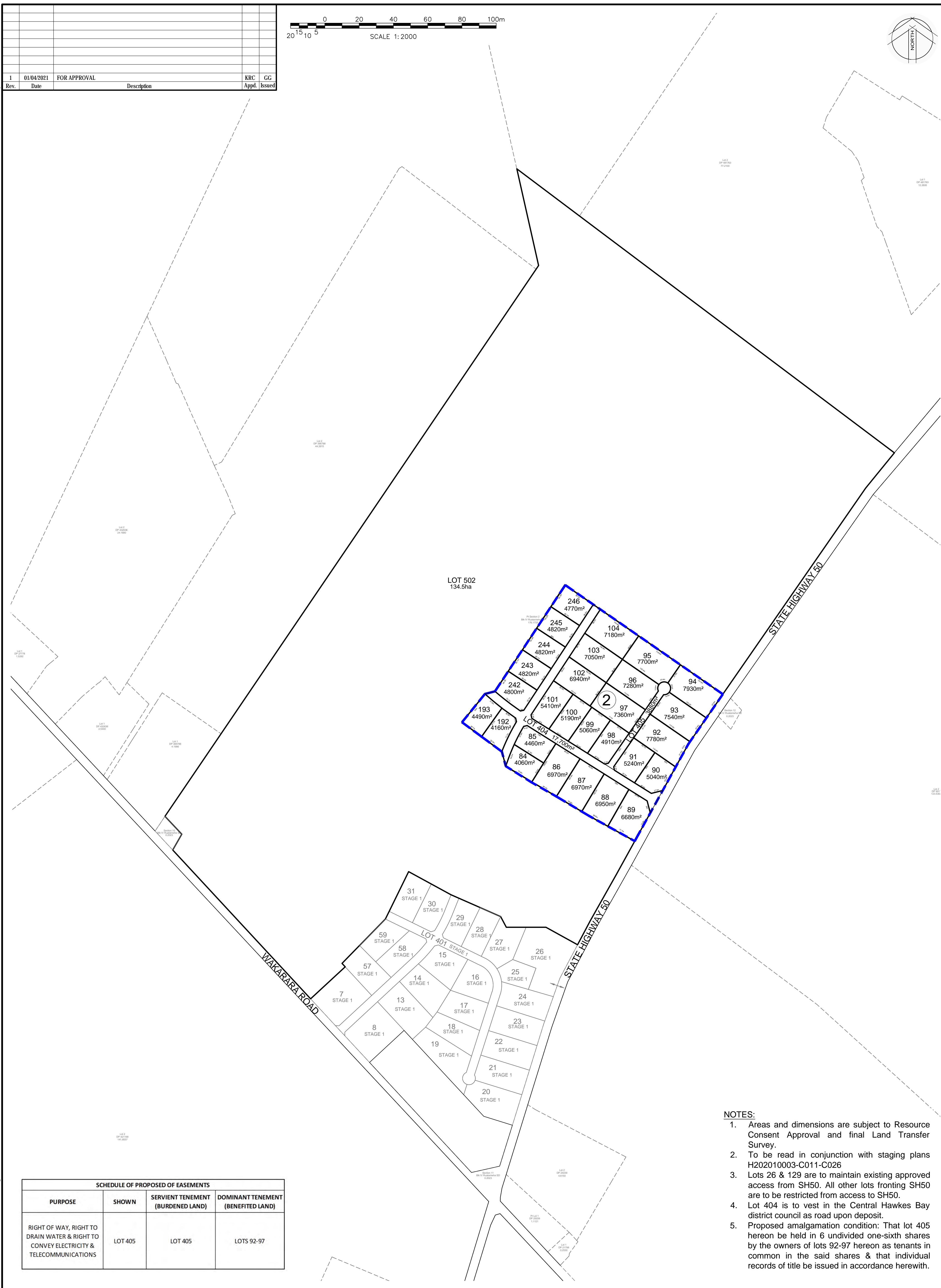
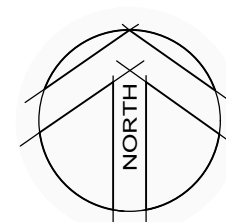


- NOTES:**
1. Areas and dimensions are subject to Resource Consent Approval and final Land Transfer Survey.
 2. To be read in conjunction with staging plans H202010003-C011-C026
 3. Lots 26 & 129 are to maintain existing approved access from SH50. All other lots fronting SH50 are to be restricted from access to SH50.
 4. Lot 401 is to vest in the Central Hawkes Bay district council as road upon deposit.

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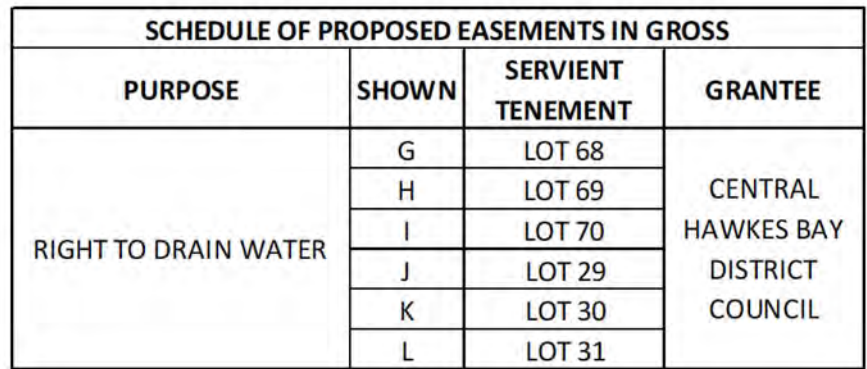
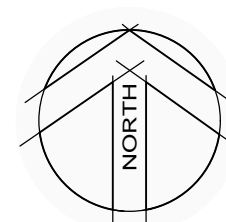


Fieldwork	Date	Client	SPRINGHILL FARM HOLDINGS				
Drawn	Date	Project	1200 STATE HIGHWAY 50 & 612 WAKARARA ROAD, ONGAONGA		Status	FOR APPROVAL NOT TO BE USED FOR CONSTRUCTION PURPOSES	
Checked	Date	SPRINGHILL FARM LIFESTYLE DEVELOPMENT			Datum		
KRC	25/01/2021	SCHEME PLAN - STAGE 1			Council Ref.		
Designed	Date	Title	SUBDIVISION OF LOT PT SECTION 2 BLK IV RUATANIWA		Scale		
GG	19/02/2021	SD, SECTION 10 BLK IV RUATANIWA SD & LOT 2 DP 395788			Size		
Approved	Date	COMPRISED IN RT HB91/1065. 382377 & HBA2/1134			HB2000	A1	
KC	19/03/2021				Drawing Number	Revision	
					H20210003-C011	1	



SCHEDULE OF PROPOSED OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITED LAND)
RIGHT OF WAY, RIGHT TO DRAIN WATER & RIGHT TO CONVEY ELECTRICITY & TELECOMMUNICATIONS	LOT 405	LOT 405	LOTS 92-97

- NOTES:**
1. Areas and dimensions are subject to Resource Consent Approval and final Land Transfer Survey.
 2. To be read in conjunction with staging plans H202010003-C011-C026
 3. Lots 26 & 129 are to maintain existing approved access from SH50. All other lots fronting SH50 are to be restricted from access to SH50.
 4. Lot 404 is to vest in the Central Hawkes Bay district council as road upon deposit.
 5. Proposed amalgamation condition: That lot 405 hereon be held in 6 undivided one-sixth shares by the owners of lots 92-97 hereon as tenants in common in the said shares & that individual records of title be issued in accordance herewith.

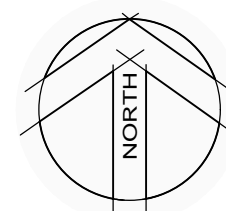
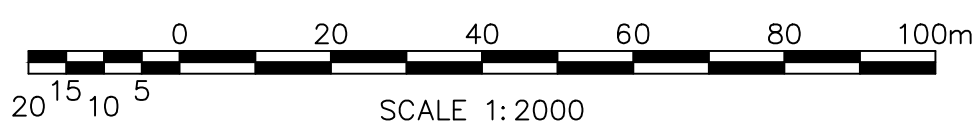


SCHEDULE OF PROPOSED OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITED LAND)
RIGHT OF WAY, RIGHT TO DRAIN WATER & RIGHT TO CONVEY ELECTRICITY & TELECOMMUNICATIONS	LOT 402	LOT 402	LOTS 71-80

NOTES:

1. Areas and dimensions are subject to Resource Consent Approval and final Land Transfer Survey.
2. To be read in conjunction with staging plans H202010003-C011-C026
3. Lots 26 & 129 are to maintain existing approved access from SH50. All other lots fronting SH50 are to be restricted from access to SH50.
4. Lot 403 is to vest in the Central Hawkes Bay district council as road upon deposit.
5. Proposed amalgamation condition: That lot 402 hereon be held in 10 undivided one-tenth shares by the owners of lots 71-80 hereon as tenants in common in the said shares & that individual records of title be issued in accordance herewith.

Fieldworked	Date	Client SPRINGHILL FARM HOLDINGS				
Drawn	Date	Project 1200 STATE HIGHWAY 50 & 612 WAKARARA ROAD, ONGAONGA SPRINGHILL FARM LIFESTYLE DEVELOPMENT SCHEME PLAN - STAGE 3	Status FOR APPROVAL NOT TO BE USED FOR CONSTRUCTION PURPOSES			
T	19/03/2021					
Checked	Date					
KRC	25/01/2021					
Designed	Date	Title SUBDIVISION OF LOT PT SECTION 2 BLK IV RUATIANIWA SD, SECTION 10 BLK IV RUATIANIWA SD & LOT 2 DP 395788 COMPRISED IN RT HB91/1065, 382377 & HBA2/1134	Datum HB2000	Council Ref.	Scale 1:2000	Size A1
GG	19/02/2021					
Approved	Date					
KC	19/03/2021					
			Drawing Number	H2010003-C013		
						Revision 1



NOTES:

1. Areas and dimensions are subject to Resource Consent Approval and final Land Transfer Survey.
2. To be read in conjunction with staging plans H202010003-C011-C026
3. Lots 26 & 129 are to maintain existing approved access from SH50. All other lots fronting SH50 are to be restricted from access to SH50.

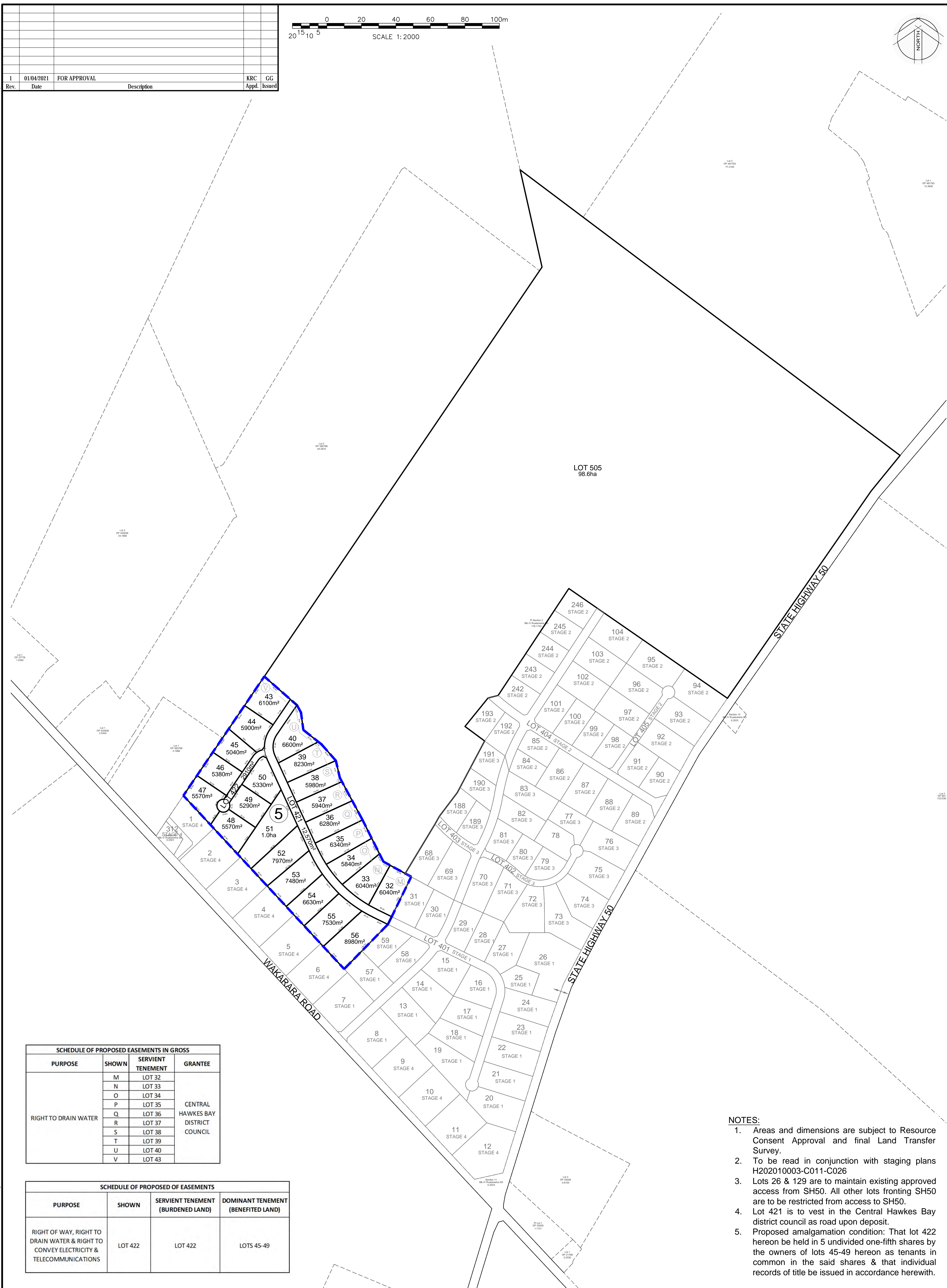
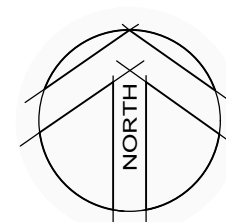
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Fieldworked	Date
Drawn LT	Date 19/03/2021
Checked KRC	Date 25/01/2021
Designed GG	Date 19/02/2021
Approved KC	19/03/2021

Client	SPRINGHILL FARM HOLDINGS
Project	1200 STATE HIGHWAY 50 & 612 WAKARARA ROAD, ONGAONGA SPRINGHILL FARM LIFESTYLE DEVELOPMENT SCHEME PLAN - STAGE 4
Title	SUBDIVISION OF LOT PT SECTION 2 BLK IV RUATANIWHA SD, SECTION 10 BLK IV RUATANIWHA SD & LOT P 29 395788 COMPRISED IN RT HB91/1065, 3823777 & HBA2/1134

Status					FOR APPROVAL				
NOT TO BE USED FOR CONSTRUCTION PURPOSES									
Datum		Council Ref.		Scale		Size			
HB20000				1:2000				A1	
Drawing Number								Revision	
H20210003-C014								1	



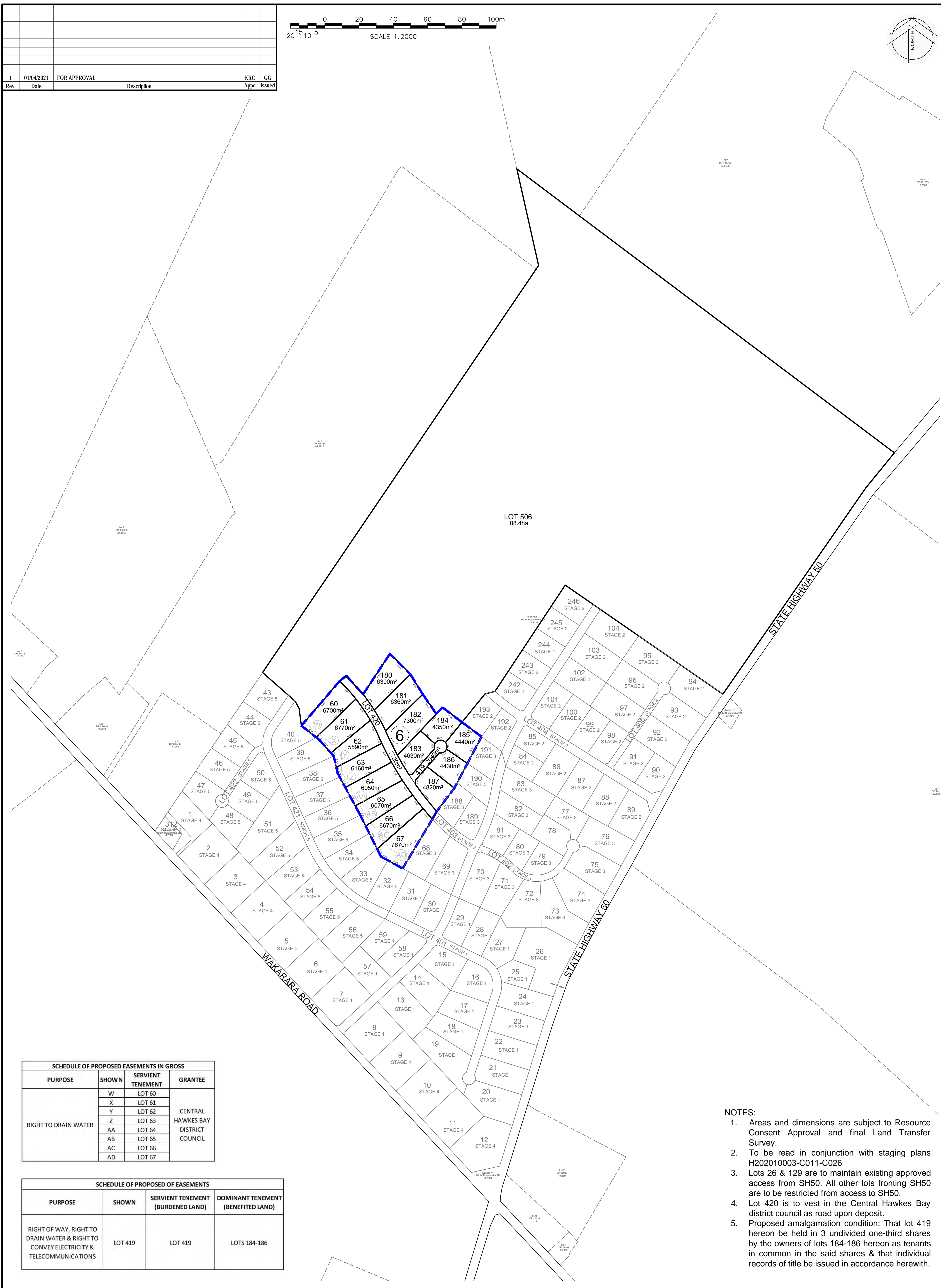
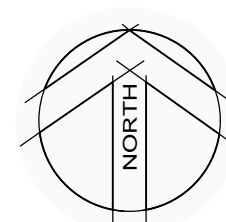
SCHEDULE OF PROPOSED EASEMENTS IN GROSS			
PURPOSE	SHOWN	SERVIENT TENEMENT	GRANTEE
RIGHT TO DRAIN WATER	M	LOT 32	CENTRAL HAWKES BAY DISTRICT COUNCIL
	N	LOT 33	
	O	LOT 34	
	P	LOT 35	
	Q	LOT 36	
	R	LOT 37	
	S	LOT 38	
	T	LOT 39	
	U	LOT 40	
	V	LOT 43	

SCHEDULE OF PROPOSED OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITED LAND)
RIGHT OF WAY, RIGHT TO DRAIN WATER & RIGHT TO CONVEY ELECTRICITY & TELECOMMUNICATIONS	LOT 422	LOT 422	LOTS 45-49

NOTES:

1. Areas and dimensions are subject to Resource Consent Approval and final Land Transfer Survey.
2. To be read in conjunction with staging plans H202010003-C011-C026
3. Lots 26 & 129 are to maintain existing approved access from SH50. All other lots fronting SH50 are to be restricted from access to SH50.
4. Lot 421 is to vest in the Central Hawkes Bay district council as road upon deposit.
5. Proposed amalgamation condition: That lot 422 hereon be held in 5 undivided one-fifth shares by the owners of lots 45-49 hereon as tenants in common in the said shares & that individual records of title be issued in accordance herewith.

Fieldworked	Date	Client SPRINGHILL FARM HOLDINGS				
Drawn T	Date 19/03/2021	Project 1200 STATE HIGHWAY 50 & 612 WAKARARA ROAD, ONGAONGA SPRINGHILL FARM LIFESTYLE DEVELOPMENT SCHEME PLAN - STAGE 5	Status	FOR APPROVAL NOT TO BE USED FOR CONSTRUCTION PURPOSES		
Checked KRC	Date 25/01/2021		Datum HB2000	Council Ref.	Scale 1:2000	Size A1
Designed GG	Date 19/02/2021		Drawing Number H2010003-C015			
Approved KC	Date 19/03/2021		Revision 1			
		Title	SUBDIVISION OF LOT PT SECTION 2 BLK IV RUATIANIWA SD, SECTION 10 BLK IV RUATIANIWA SD & LOT 2 DP 395788 COMPRISED IN RT HB91/1065, 382377 & HBA2/1134			

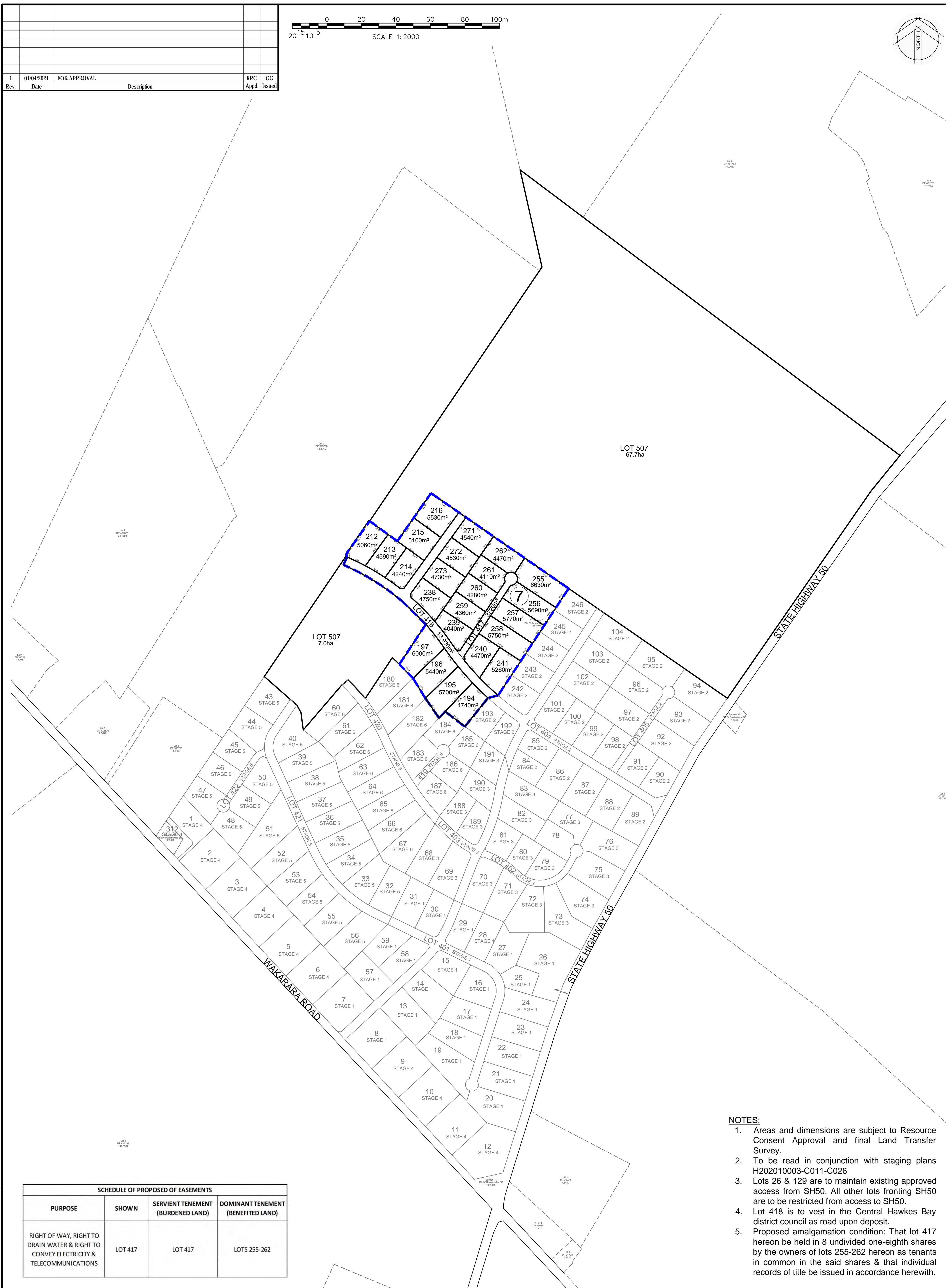
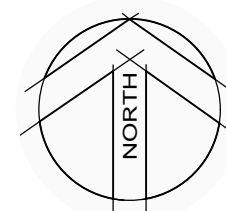


SCHEDULE OF PROPOSED EASEMENTS IN GROSS			
PURPOSE	SHOWN	SERVIENT TENEMENT	GRANTEE
RIGHT TO DRAIN WATER	W	LOT 60	CENTRAL HAWKES BAY DISTRICT COUNCIL
	X	LOT 61	
	Y	LOT 62	
	Z	LOT 63	
	AA	LOT 64	
	AB	LOT 65	
	AC	LOT 66	
	AD	LOT 67	

SCHEDULE OF PROPOSED OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITED LAND)
RIGHT OF WAY, RIGHT TO DRAIN WATER & RIGHT TO CONVEY ELECTRICITY & TELECOMMUNICATIONS	LOT 419	LOT 419	LOTS 184-186

NOTES:

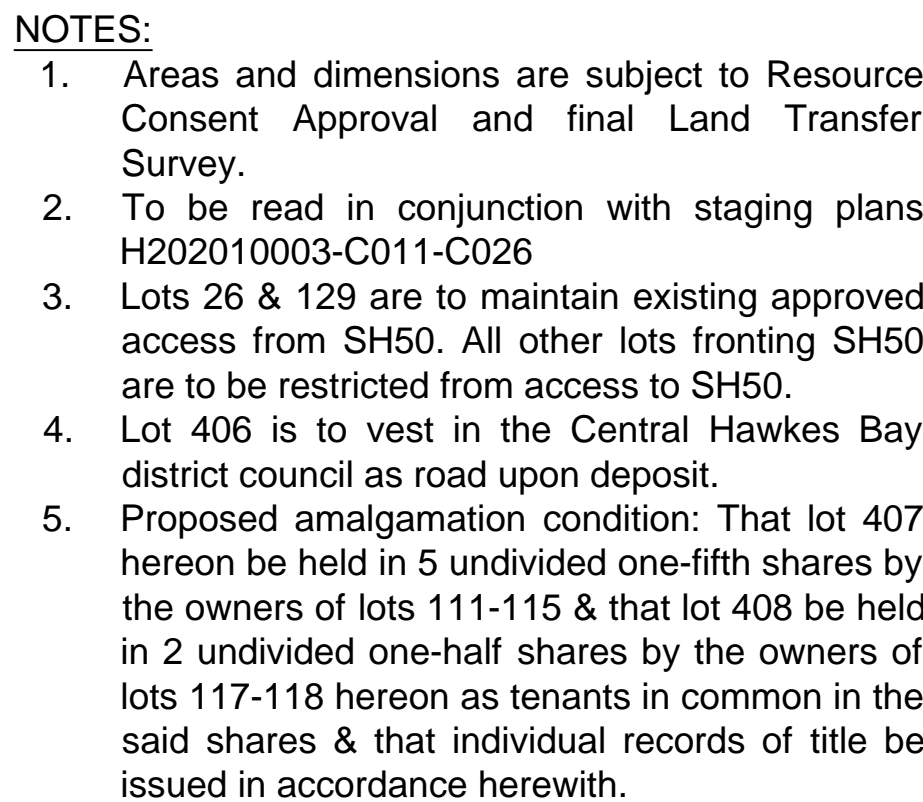
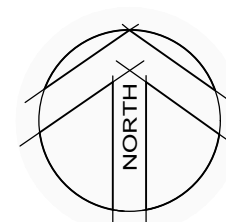
1. Areas and dimensions are subject to Resource Consent Approval and final Land Transfer Survey.
2. To be read in conjunction with staging plans H202010003-C011-C026
3. Lots 26 & 129 are to maintain existing approved access from SH50. All other lots fronting SH50 are to be restricted from access to SH50.
4. Lot 420 is to vest in the Central Hawkes Bay district council as road upon deposit.
5. Proposed amalgamation condition: That lot 419 hereon be held in 3 undivided one-third shares by the owners of lots 184-186 hereon as tenants in common in the said shares & that individual records of title be issued in accordance herewith.



SCHEDULE OF PROPOSED OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITED LAND)
RIGHT OF WAY, RIGHT TO DRAIN WATER & RIGHT TO CONVEY ELECTRICITY & TELECOMMUNICATIONS	LOT 417	LOT 417	LOTS 255-262

NOTES:

1. Areas and dimensions are subject to Resource Consent Approval and final Land Transfer Survey.
2. To be read in conjunction with staging plans H202010003-C011-C026
3. Lots 26 & 129 are to maintain existing approved access from SH50. All other lots fronting SH50 are to be restricted from access to SH50.
4. Lot 418 is to vest in the Central Hawkes Bay district council as road upon deposit.
5. Proposed amalgamation condition: That lot 417 hereon be held in 8 undivided one-eighth shares by the owners of lots 255-262 hereon as tenants in common in the said shares & that individual records of title be issued in accordance herewith.



SCHEDULE OF PROPOSED OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITED LAND)
RIGHT OF WAY, RIGHT TO DRAIN WATER & RIGHT TO CONVEY ELECTRICITY & TELECOMMUNICATIONS	LOT 407	LOT 407	LOTS 111-115
	LOT 408	LOT 408	LOTS 117-118

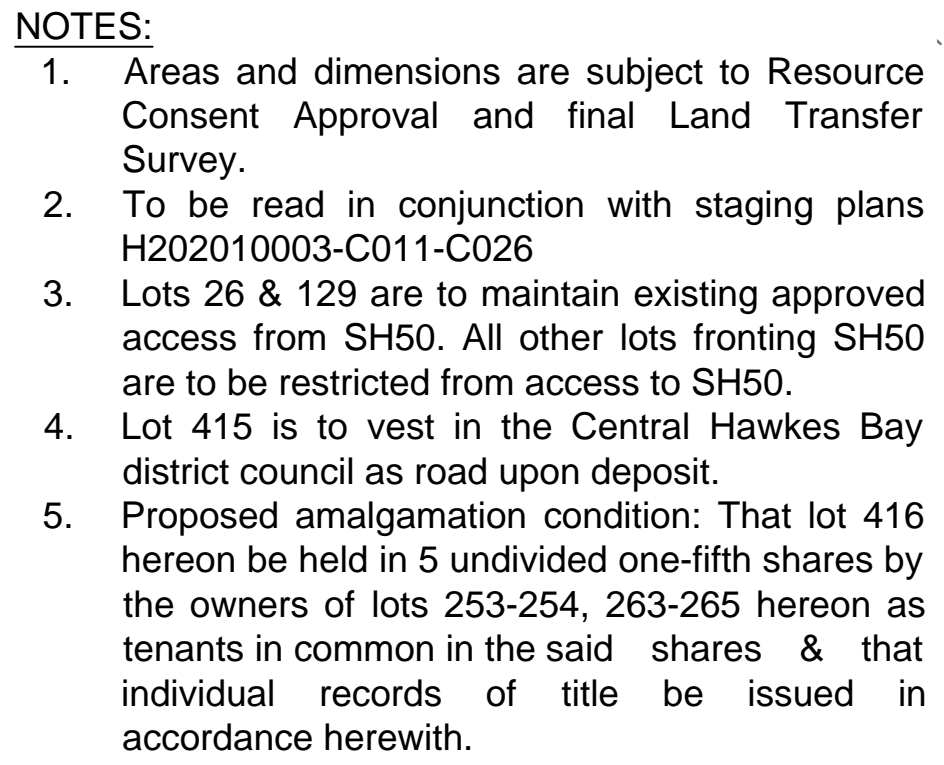
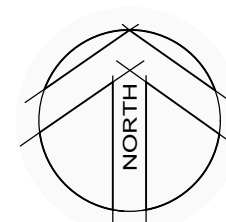
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Fieldworked	Date
Drawn	Date
LT	19/03/2021
Checked	Date
KRC	25/01/2021
Designed	Date
GG	19/02/2021
Approved	
KC	19/03/2021

Client	SPRINGHILL FARM HOLDINGS
Project	1200 STATE HIGHWAY 50 & 612 WAKARARA ROAD, ONGAONGA SPRINGHILL FARM LIFESTYLE DEVELOPMENT SCHEME PLAN - STAGE 8
Title	SUBDIVISION OF LOT PT SECTION 2 BLK IV RUATANIWHA SD, SECTION 10 BLK IV RUATANIWHA SD & LOT 2 DP 395788 COMPRISED IN RT HB91/1065, 382377 & HBA2/1134

<div> <div>Status</div> <div> <div>FOR APPROVAL</div> <div>NOT TO BE USED FOR CONSTRUCTION PURPOSES</div> </div> </div>			
<div>Datum</div> <div>HB2000</div>	<div>Council Ref.</div>	<div>Scale</div> <div>1:2000</div>	<div>Size</div> <div>A1</div>
<div>Drawing Number</div> <div>H20210003-C018</div>			<div>Revision</div> <div>1</div>



SCHEDULE OF PROPOSED OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITED LAND)
RIGHT OF WAY, RIGHT TO DRAIN WATER & RIGHT TO CONVEY ELECTRICITY & TELECOMMUNICATIONS	LOT 416	LOT 416	LOTS 253-254, 263-265

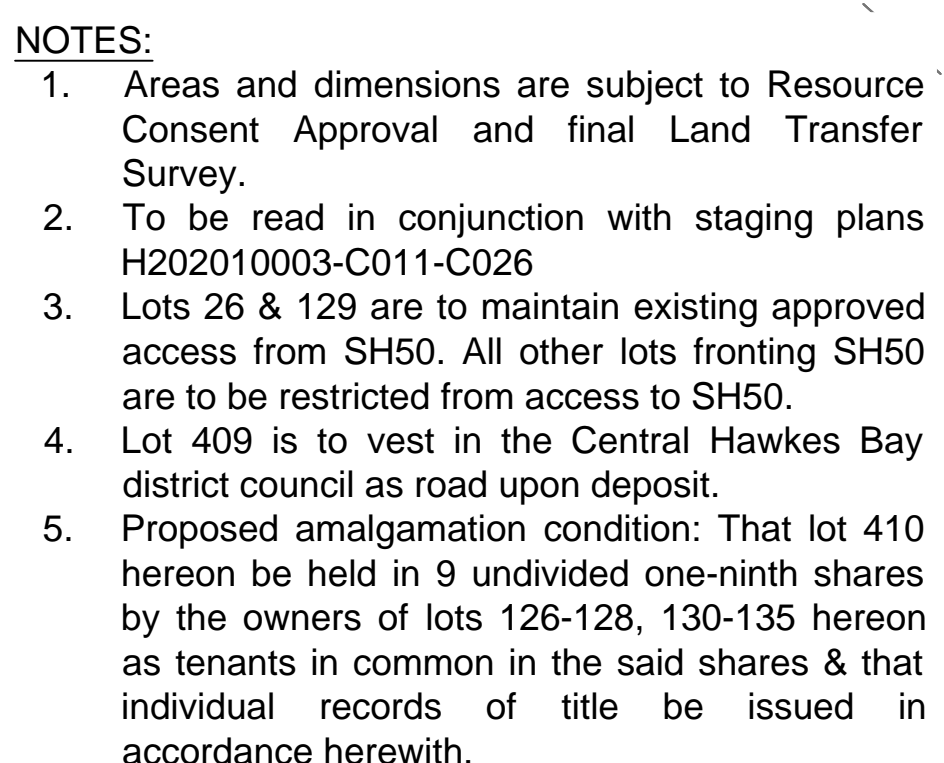
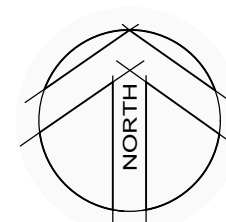
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Drawn LT	Date 19/03/2021
Checked KRC	Date 25/01/2021
Designed GG	Date 19/02/2021
Approved KC	Date 19/03/2021

Client	SPRINGHILL FARM HOLDINGS
Project	1200 STATE HIGHWAY 50 & 612 WAKARARA ROAD, ONGAONGA SPRINGHILL FARM LIFESTYLE DEVELOPMENT SCHEME PLAN - STAGE 9
Title	SUBDIVISION OF LOT PT SECTION 2 BLK IV RUATANIWHA SD, SECTION 10 BLK IV RUATANIWHA SD & LOT 2 DP 395788 COMPRISED IN RT HB91/1065, 3823777 & HBA2/1134

Status		FOR APPROVAL	
NOT TO BE USED FOR CONSTRUCTION PURPOSES			
Date	Council Ref.	Scale	Size
HB2000		1:2000	A1
Drawing Number			Revision
H20210003-C019			1



SCHEDULE OF PROPOSED OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITED LAND)
RIGHT OF WAY, RIGHT TO DRAIN WATER & RIGHT TO CONVEY ELECTRICITY & TELECOMMUNICATIONS	LOT 410	LOT 410	LOTS 126-128, 130-135

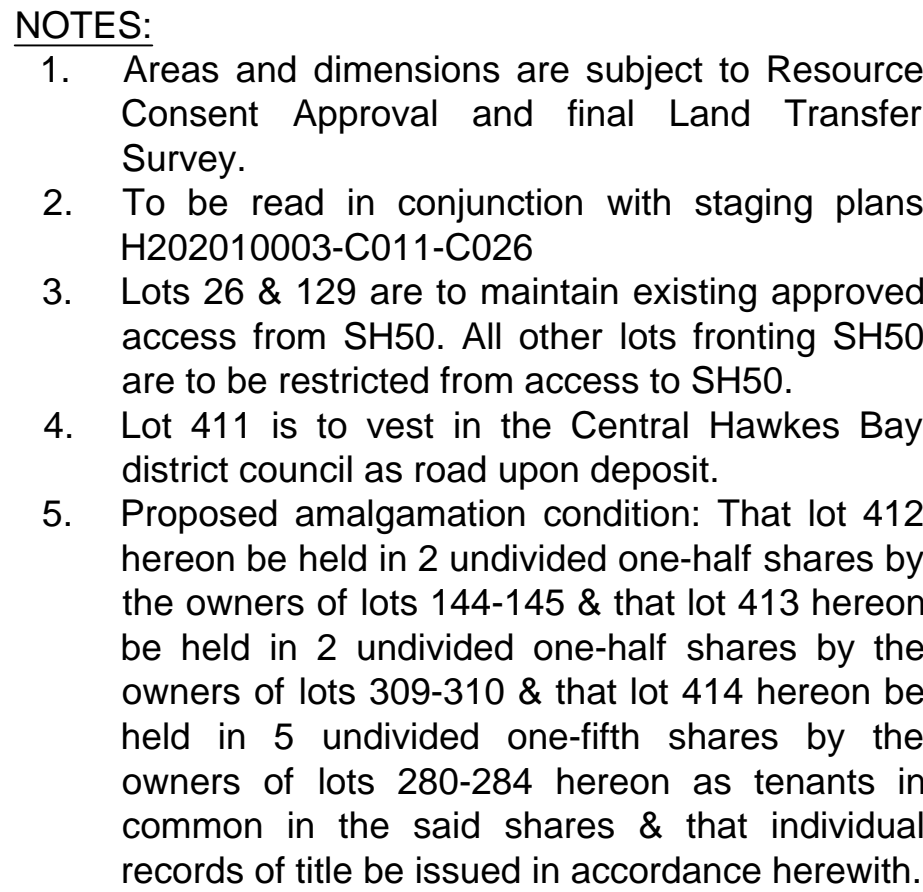
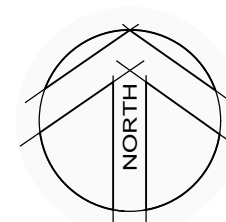
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Fieldworked	Date
Drawn LT	Date 19/03/2021
Checked KRC	Date 25/01/2021
Designed GG	Date 19/02/2021
Approved KC	19/03/2021

Client	SPRINGHILL FARM HOLDINGS
Project	1200 STATE HIGHWAY 50 & 612 WAKARARA ROAD, ONGAONGA SPRINGHILL FARM LIFESTYLE DEVELOPMENT SCHEME PLAN - STAGE 10
Title	SUBDIVISION OF LOT PT SECTION 2 BLK IV RUATANIWHA SD. SECTION 10 BLK IV RUATANIWHA SD & LOT 2 DP 395788 COMPRISED IN RT HR91/1065 382'377' & HR2/1134.

Status				<h1>FOR APPROVAL</h1> <p>NOT TO BE USED FOR CONSTRUCTION PURPOSES</p>	
Datum		Council Ref.	Scale	Size	A1
HB2000			1:2000		
Drawing Number				Revision	
H20210003-C020				1	



SCHEDULE OF PROPOSED OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITED LAND)
RIGHT OF WAY, RIGHT TO DRAIN WATER & RIGHT TO CONVEY ELECTRICITY & TELECOMMUNICATIONS	LOT 412	LOT 412	LOTS 144-145
	LOT 413	LOT 413	LOTS 309-310
	LOT 414	LOT 414	LOTS 280-284

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Fieldworked	Date
Drawn LT	Date 19/03/2021
Checked KRC	Date 25/01/2021
Designed GG	Date 19/02/2021
Approved KC	19/03/2021

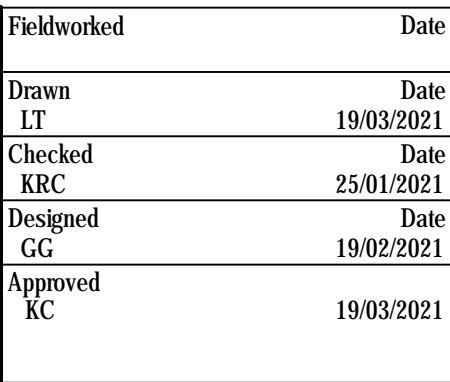
Client	SPRINGHILL FARM HOLDINGS
Project	1200 STATE HIGHWAY 50 & 612 WAKARARA ROAD, ONGAONGA SPRINGHILL FARM LIFESTYLE DEVELOPMENT SCHEME PLAN - STAGE 11
Title	SUBDIVISION OF LOT PT SECTION 2 BLK IV RUATANIWHA SD, SECTION 10 BLK IV RUATANIWHA SD & LOT 2 PD 395788 COMPRISED IN RT HB91/1065, 382377 & HBA2/1134

<div> <div>Status</div> <div> <div>FOR APPROVAL</div> <div>NOT TO BE USED FOR CONSTRUCTION PURPOSES</div> </div> </div>			
<div>Datum</div> <div>HB2000</div>	<div>Council Ref.</div>	<div>Scale</div> <div>1:2000</div>	<div>Size</div> <div>A1</div>
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SCHEDULE OF PROPOSED OF EASEMENTS

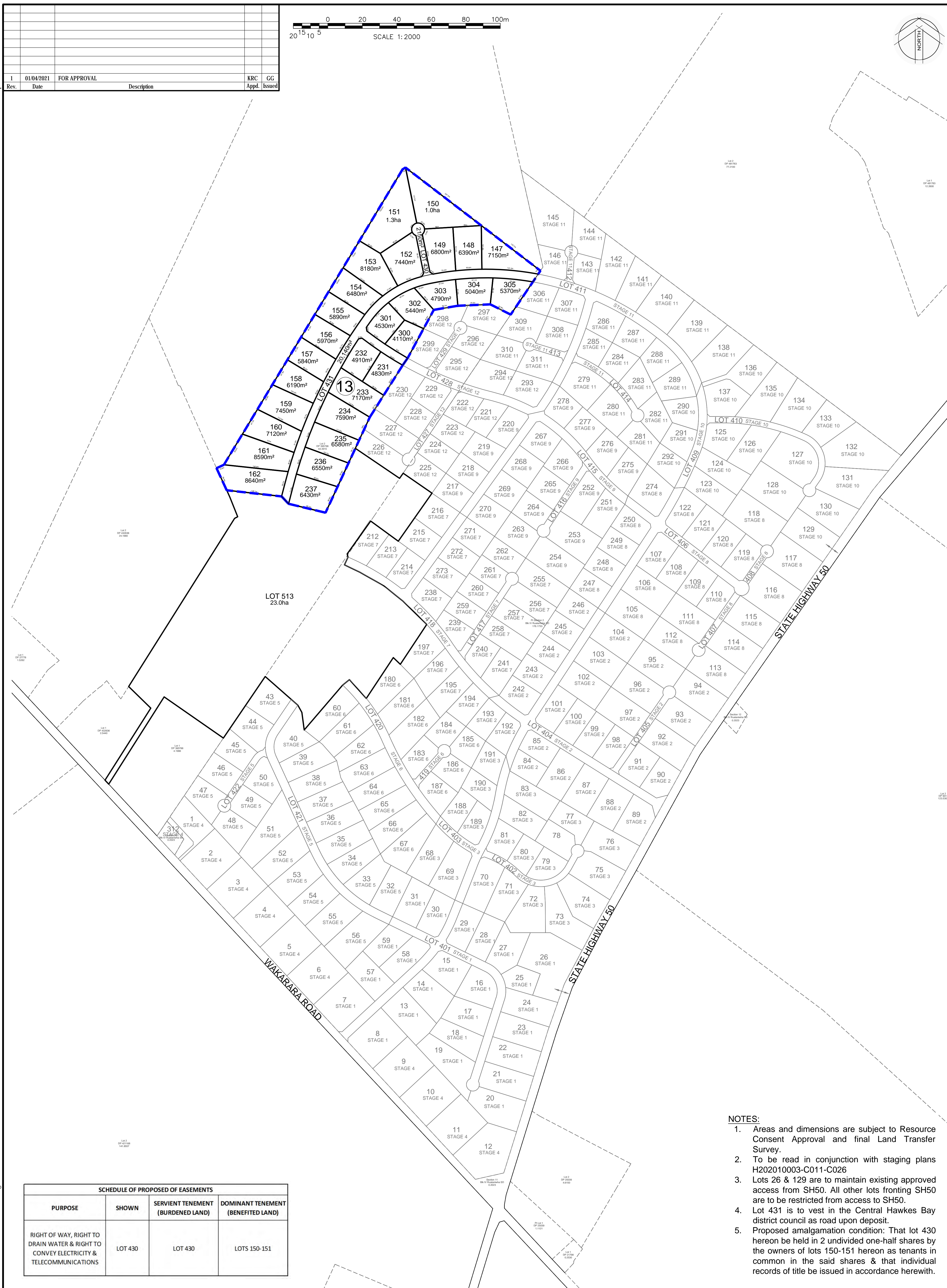
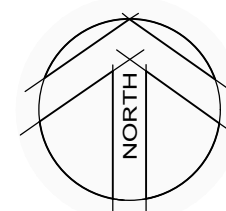
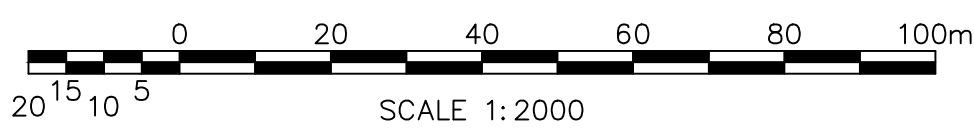
PURPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITED LAND)
RIGHT OF WAY, RIGHT TO DRAIN WATER & RIGHT TO CONVEY ELECTRICITY & TELECOMMUNICATIONS	LOT 427	LOT 427	LOTS 223-228
	LOT 429	LOT 429	LOTS 296-298

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Status				<h1>FOR APPROVAL</h1> <p>NOT TO BE USED FOR CONSTRUCTION PURPOSES</p>	
Datum HB2000		Council Ref.		Scale 1:2000	
				Size A1	
Drawing Number H20210003-C022					Revision 1

- NOTES:**
1. Areas and dimensions are subject to Resource Consent Approval and final Land Transfer Survey.
 2. To be read in conjunction with staging plans H202010003-C011-C026
 3. Lots 26 & 129 are to maintain existing approved access from SH50. All other lots fronting SH50 are to be restricted from access to SH50.
 4. Lot 428 is to vest in the Central Hawkes Bay district council as road upon deposit.
 5. Proposed amalgamation condition: That lot 427 hereon be held in 6 undivided one-sixth shares by the owners of lots 223-228 & that lot 429 hereon be held in 3 undivided one-third shares by the owners of lots 296-298 hereon as tenants in common in the said shares & that individual records of title be issued in accordance herewith.



SCHEDULE OF PROPOSED OF EASEMENTS			
PURPOSE	SHOWN	SERVIENT TENEMENT (BURDENED LAND)	DOMINANT TENEMENT (BENEFITED LAND)
RIGHT OF WAY, RIGHT TO DRAIN WATER & RIGHT TO CONVEY ELECTRICITY & TELECOMMUNICATIONS	LOT 430	LOT 430	LOTS 150-151

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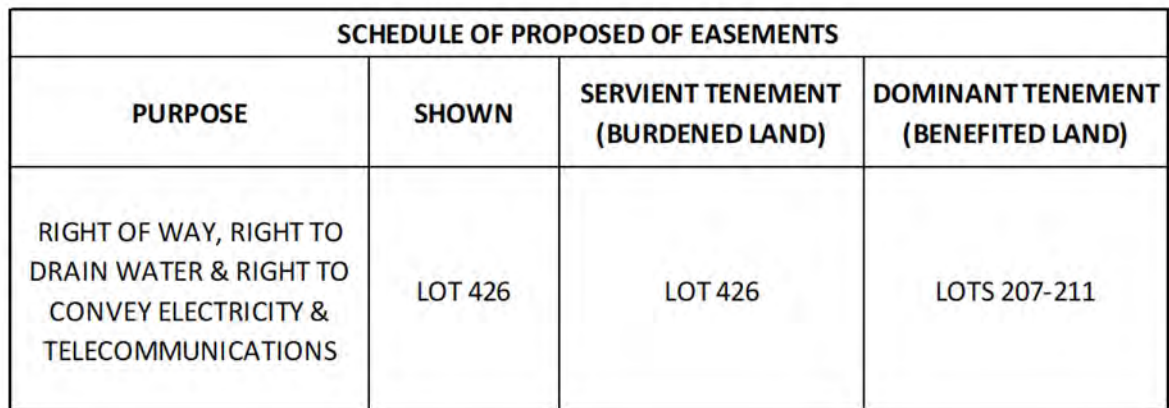
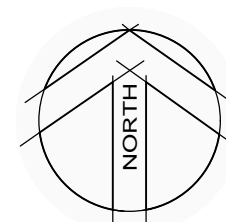
Fieldworked	Date
Drawn LT	Date 19/03/2021
Checked KRC	Date 25/01/2021
Designed GG	Date 19/02/2021
Approved KC	19/03/2021

Client	SPRINGHILL FARM HOLDINGS
Project	1200 STATE HIGHWAY 50 & 612 WAKARARA ROAD, ONGAONGA SPRINGHILL FARM LIFESTYLE DEVELOPMENT SCHEME PLAN - FASE 13
Title	SUBDIVISION OF LOT PT SECTION 2 BLK IV RUATANIWHA SD, SECTION 10 BLK IV RUATANIWHA SD & LOT 2 DP 395788 COMPRISED IN RT HB91/1065, 382377 & HBA2/1134

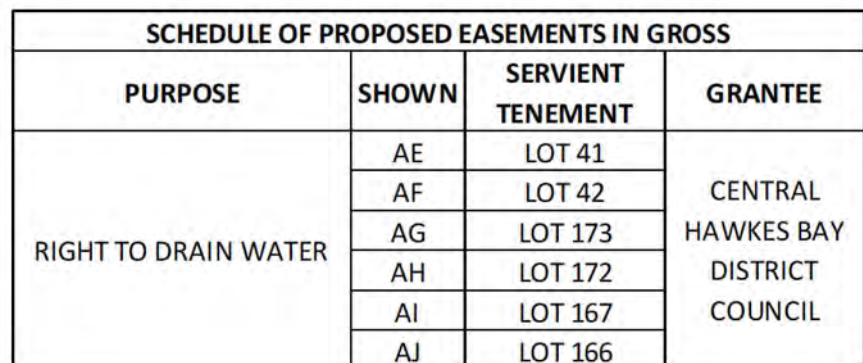
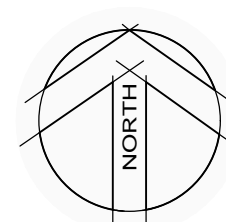
Status				FOR APPROVAL NOT TO BE USED FOR CONSTRUCTION PURPOSES			
Datum		Council Ref.		Scale		Size	
HB2000				1:2000		A1	
Drawing Number						Revision	
H20210003-C023						1	

NOTES:

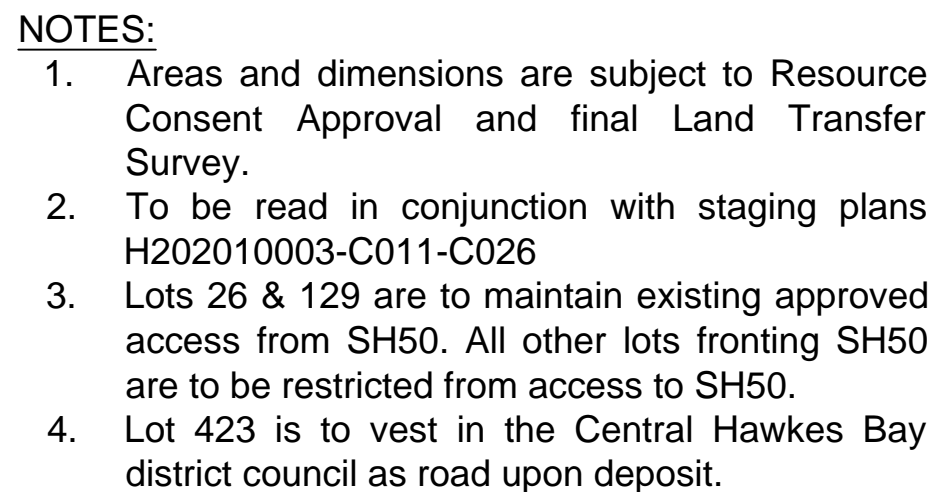
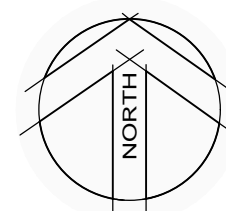
1. Areas and dimensions are subject to Resource Consent Approval and final Land Transfer Survey.
2. To be read in conjunction with staging plans H202010003-C011-C026
3. Lots 26 & 129 are to maintain existing approved access from SH50. All other lots fronting SH50 are to be restricted from access to SH50.
4. Lot 431 is to vest in the Central Hawkes Bay district council as road upon deposit.
5. Proposed amalgamation condition: That lot 430 hereon be held in 2 undivided one-half shares by the owners of lots 150-151 hereon as tenants in common in the said shares & that individual records of title be issued in accordance herewith.



- NOTES:**
1. Areas and dimensions are subject to Resource Consent Approval and final Land Transfer Survey.
 2. To be read in conjunction with staging plans H202010003-C011-C026
 3. Lots 26 & 129 are to maintain existing approved access from SH50. All other lots fronting SH50 are to be restricted from access to SH50.
 4. Lot 425 is to vest in the Central Hawkes Bay district council as road upon deposit.
 5. Proposed amalgamation condition: That lot 426 hereon be held in 5 undivided one-fifth shares by the owners of lots 207-211 hereon as tenants in common in the said shares & that individual records of title be issued in accordance herewith.



- NOTES:**
1. Areas and dimensions are subject to Resource Consent Approval and final Land Transfer Survey.
 2. To be read in conjunction with staging plans H202010003-C011-C026
 3. Lots 26 & 129 are to maintain existing approved access from SH50. All other lots fronting SH50 are to be restricted from access to SH50.
 4. Lot 424 is to vest in the Central Hawkes Bay district council as road upon deposit.



SCHEDULE OF PROPOSED EASEMENTS IN GROSS			
PURPOSE	SHOWN	SERVIENT TENEMENT	GRANTEE
RIGHT TO DRAIN WATER	AK	LOT 168	CENTRAL HAWKES BAY DISTRICT COUNCIL
	AL	LOT 171	

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Fieldworked	Date
Drawn LT	Date 19/03/2021
Checked KRC	Date 25/01/2021
Designed GG	Date 19/02/2021
Approved KC	Date 19/03/2021

Client	SPRINGHILL FARM HOLDINGS
Project	1200 STATE HIGHWAY 50 & 612 WAKARARA ROAD, ONGAONGA SPRINGHILL FARM LIFESTYLE DEVELOPMENT SCHEME PLAN - STAGE 16
Title	SUBDIVISION OF LOT PT SECTION 2 BLK IV RUATANIWHA SD, SECTION 10 BLK IV RUATANIWHA SD & LOT 2 DP 395788 COMPRISED IN RT HB91/1065, 3823777 & HBA2/1134

Status				FOR APPROVAL	
NOT TO BE USED FOR CONSTRUCTION PURPOSES					
Date	Council Ref.	Scale	Size		
HB2000		1:2000	A1		
Drawing Number				Revision	
H20210003-C026				1	

APPENDIX B RECORDS OF TITLE



RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy



R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **382377**
Land Registration District **Hawkes Bay**
Date Issued 22 November 2007

Prior References
HBY1/391

Estate Fee Simple
Area 44.3915 hectares more or less
Legal Description Lot 2 Deposited Plan 395788

Original Registered Owners
Kevin Stephen Murphy, Suzanne Joy Murphy and Eric Gordon Borrie

Interests

704573.3 Mortgage to Southland Building Society - 11.7.2000 at 9:07 am
Subject to a right to convey water over part marked D on DP 395788 created by Easement Instrument 7624642.4 - 22.11.2007 at 9:00 am
7647685.1 Discharge of Mortgage 704573.3 - 11.12.2007 at 1:09 pm
7647685.2 Transfer to Tony Graham Weber, Robyn Delle Weber and L.D. & P. Trustees Limited - 11.12.2007 at 1:09 pm
7647685.3 Mortgage to Westpac New Zealand Limited - 11.12.2007 at 1:09 pm
8347257.1 Discharge of Mortgage 7647685.3 - 24.11.2009 at 11:58 am
8347257.2 Transfer to Colin John Baker, Janice Lillian Baker, Kevin Colin Baker and Laurence Ivan Redshaw - 24.11.2009 at 11:58 am
9371083.1 Transmission to Janice Lillian Baker, Kevin Colin Baker and Laurence Ivan Redshaw as survivor(s) - 14.5.2013 at 2:19 pm
9499063.1 Transmission to Kevin Colin Baker and Laurence Ivan Redshaw as survivor(s) - 10.9.2013 at 9:34 am
10293927.1 Transfer to William John Foley, Abigail Jane Foley and Sainsbury Greer Trustee Company Limited - 21.12.2015 at 4:53 pm
10293927.2 Mortgage to ASB Bank Limited - 21.12.2015 at 4:53 pm
11941116.1 Discharge of Mortgage 10293927.2 - 30.11.2020 at 3:15 pm
11941116.2 Transfer to Ellmers Family Trustee Limited - 30.11.2020 at 3:15 pm



RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy




R.W. Muir
Registrar-General
of Land

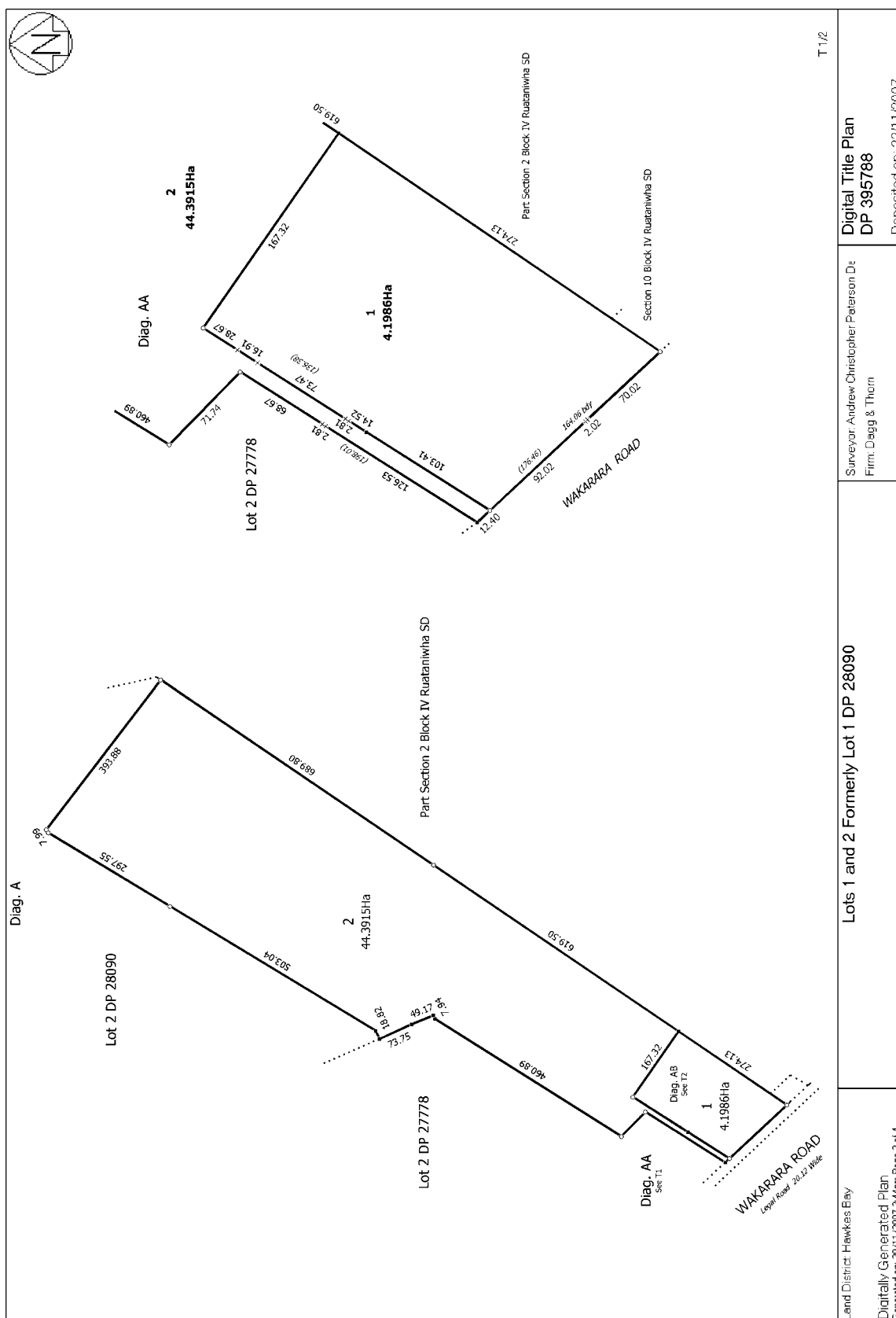
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Land Registration District **Hawkes Bay**
Date Issued 22 November 2007

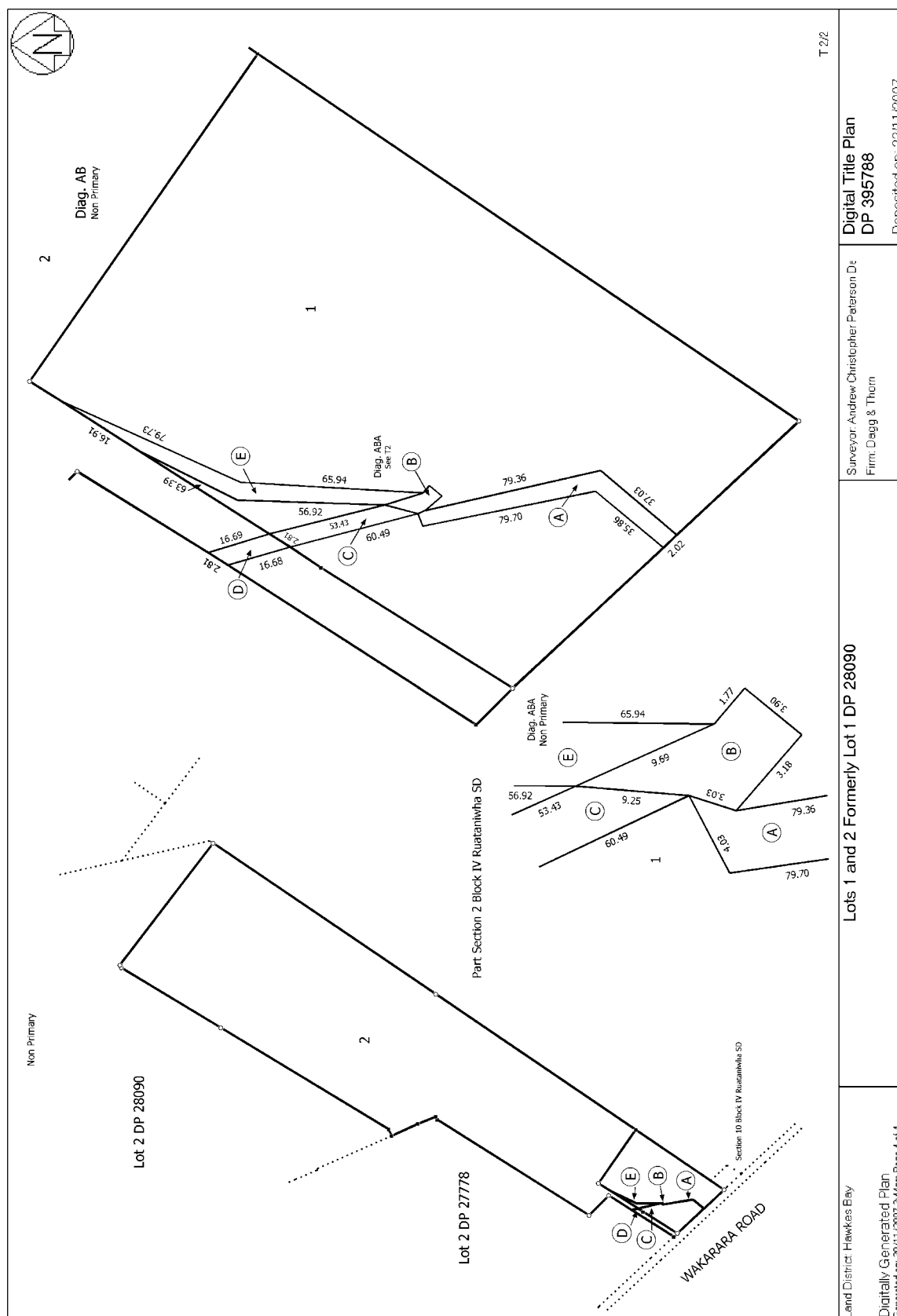
Prior References
HBY1/391

Estate Fee Simple
Area 44.3915 hectares more or less
Legal Description Lot 2 Deposited Plan 395788
Registered Owners
Ellmers Family Trustee Limited

Interests

Subject to a right to convey water over part marked D on DP 395788 created by Easement Instrument 7624642.4 - 22.11.2007 at 9:00 am







RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Historical Search Copy



R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **HBG1/1065**
Land Registration District **Hawkes Bay**
Date Issued 24 September 1975

Prior References
HB74/147

Estate Fee Simple
Area 176.1732 hectares more or less
Legal Description Part Section 2 Block IV Ruataniwha
Survey District

Original Registered Owners
C.L. Chesterman Farming Limited

Interests

340387.1 Mortgage to Nancy May Chesterman, Brian George Chesterman and Charles Leo Chesterman - 4.7.1977 at 9.09 am
624987.3 Mortgage to Charles Leo Chesterman, Roger Douglas Jull and Allen Curtis Cowan - 7.6.1995 at 11.25 am
5108329.1 Transmission of Mortgage 340387.1 to Brian George Chesterman and Charles Leo Chesterman - 14.11.2001 at 12:03 pm
5108329.2 Discharge of Mortgage 340387.1 - 14.11.2001 at 12:03 pm
5731624.1 Gazette Notice declaring adjoining State Highway 50 to be a Limited access road- 17.9.2003 at 9:00 am
5744406.4 Notice pursuant to Section 91 Transit New Zealand Act 1989 - 26.9.2003 at 9:00 am
5744449.1 Notice pursuant to Section 91 Transit New Zealand Act 1989 - 26.9.2003 at 9:00 am
5744449.2 Notice pursuant to Section 91 Transit New Zealand Act 1989 - 26.9.2003 at 9:00 am
5744449.3 Notice pursuant to Section 91 Transit New Zealand Act 1989 - 26.9.2003 at 9:00 am
5744449.4 Notice pursuant to Section 91 Transit New Zealand Act 1989 - 26.9.2003 at 9:00 am
7390319.1 Transfer of Mortgage 624987.3 to Louise Frances Chesterman , Roger Douglas Jull and Charles Leo Chesterman - 28.5.2007 at 9:00 am
11248907.2 Transmission of Mortgage 624987.3 to Louise Frances Chesterman and Charles Leo Chesterman as survivor(s) - 29.7.2019 at 5:13 pm
11999150.1 Discharge of Mortgage 624987.3 - 29.1.2021 at 1:15 pm
11999150.3 Transfer to Sandra Ellmers Family Trustee Limited - 29.1.2021 at 1:15 pm

Reference:

Prior C/T. 74/147(balance)

Transfer No.

N/C. Order No.

S.L.C. 317921.1



Land and Deeds 70

No. G1/1065

REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 24th day of September one thousand nine hundred and seventy-five under the seal of the District Land Registrar of the Land Registration District of HAWKE'S BAY

WITNESSETH that BRIAN GEORGE CHESTERMAN of Dannevirke, Farmer and CHARLES LEO CHESTERMAN of Onga Onga, Farmer as tenants in common in equal shares are

seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 176.1732 hectares more or less being part Section 2 Block IV Ruataniwha Survey District



Interests as at Date of Issue:

1. 127032 Mortgage to The Government Insurance Commissioners - 12.1956 at 10.50 a.m. (varied by one memorandum of variation).
2. 180116 Mortgage to Nancy May Chesterman - 24.7.1963 at 11.30 a.m.
3. 274406 Mortgage to Charles Leo Chesterman - 30.11.1972 at 11.30 a.m.

4. 317921.1 Statutory Land Charge under the Rural Housing Act 1959 - The Chairman Councillors of the Hawke's Bay County of Waipara - 15.1.1975 at 10.34 a.m.

DISCHARGED 20.3.1991
D.L.R.

- 340387.1 Mortgage to Nancy May Chesterman, Brian George Chesterman and Charles Leo Chesterman - 4.7.1977 at 9.9a.m.

A.L.R.

- 341845.1 Variation of Mortgage 180116 - 8.8.1977 at 9.15 a.m.

A.L.R.

- 536171.1 Transfer to Charles Leo Chesterman of Onga Onga, Farmer, Roger Douglas Jull of Tikokino, Farmer and Allen Curtis Cowan of Hastings, Clerk - 5.10.1990 at 2p.m.

A.L.R.

- 536171.2 Mortgage to Charles Leo Chesterman - 5.10.1990 at 2p.m.

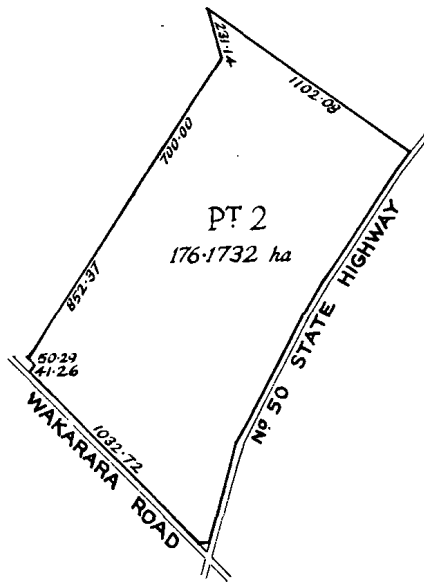
A.L.R.

- 624987.2 Transfer to C.L. Chesterman Farming Limited at Hastings - 7.6.1995 at 11.25a.m.

A.L.R.

- 624987.3 Mortgage to Charles Leo Chesterman, Roger Douglas Jull and Allen Curtis Cowan - 7.6.1995 at 11.25a.m.

A.L.R.



MEASUREMENTS ARE METRIC
S.O.'s 1335, 2866

No. G1/1065

3,000/8/67-37863 W
Register copy for L. & D. 69, 71, 72



RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy




R.W. Muir
Registrar-General
of Land

Identifier **HBG1/1065**
Land Registration District **Hawkes Bay**
Date Issued 24 September 1975

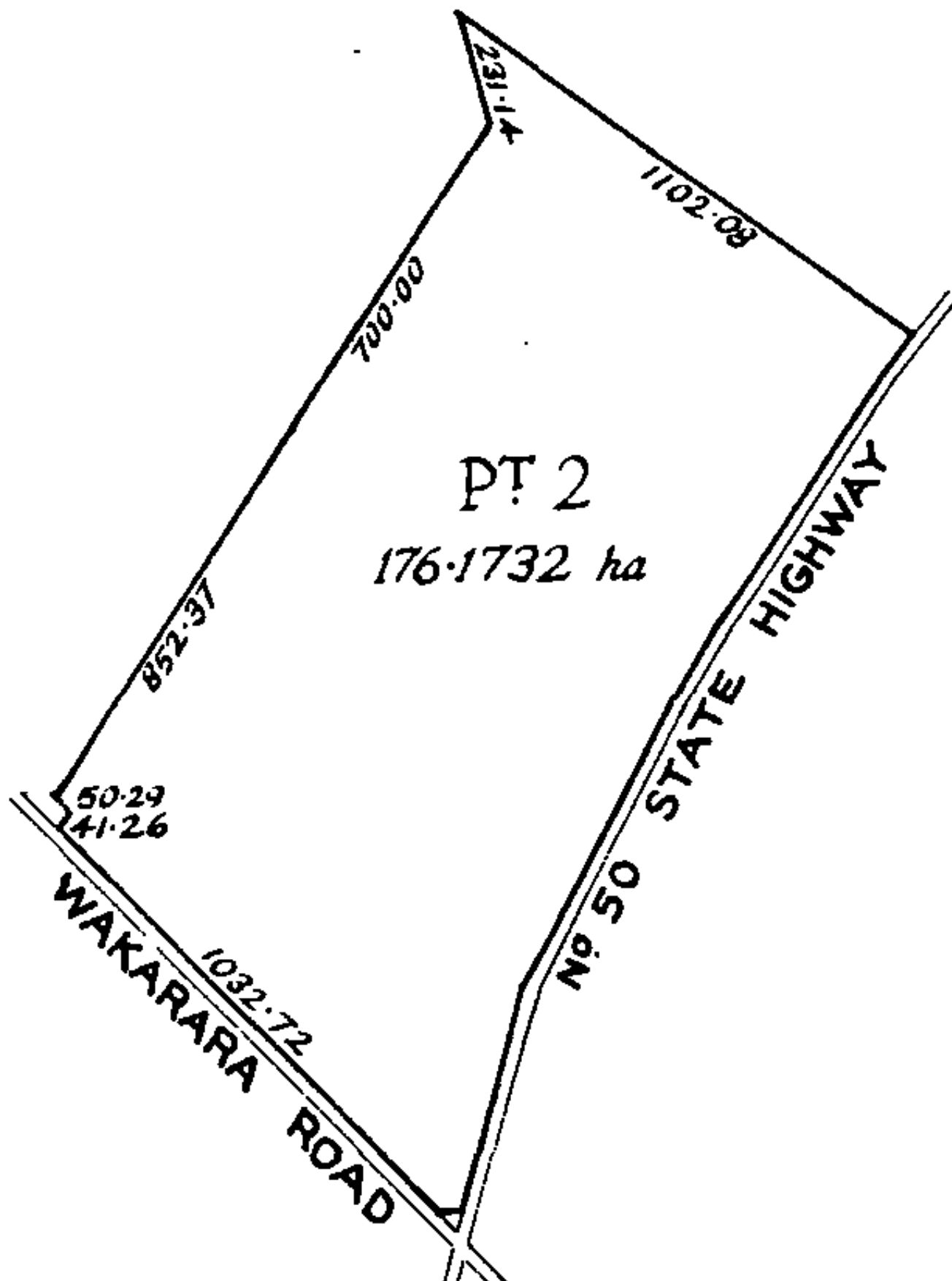
Prior References
HB74/147

Estate Fee Simple
Area 176.1732 hectares more or less
Legal Description Part Section 2 Block IV Ruataniwha
Survey District

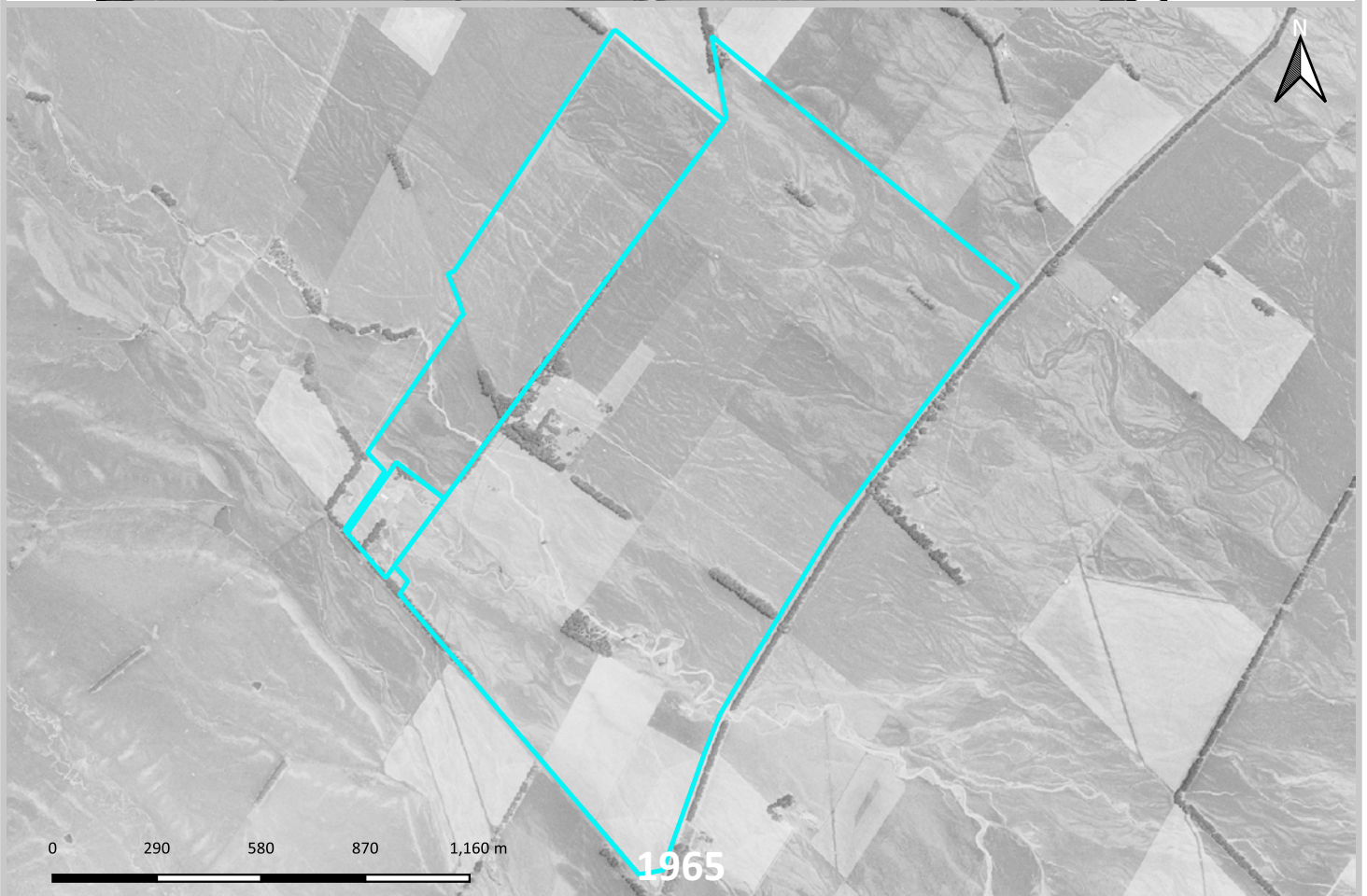
Registered Owners
Sandra Ellmers Family Trustee Limited

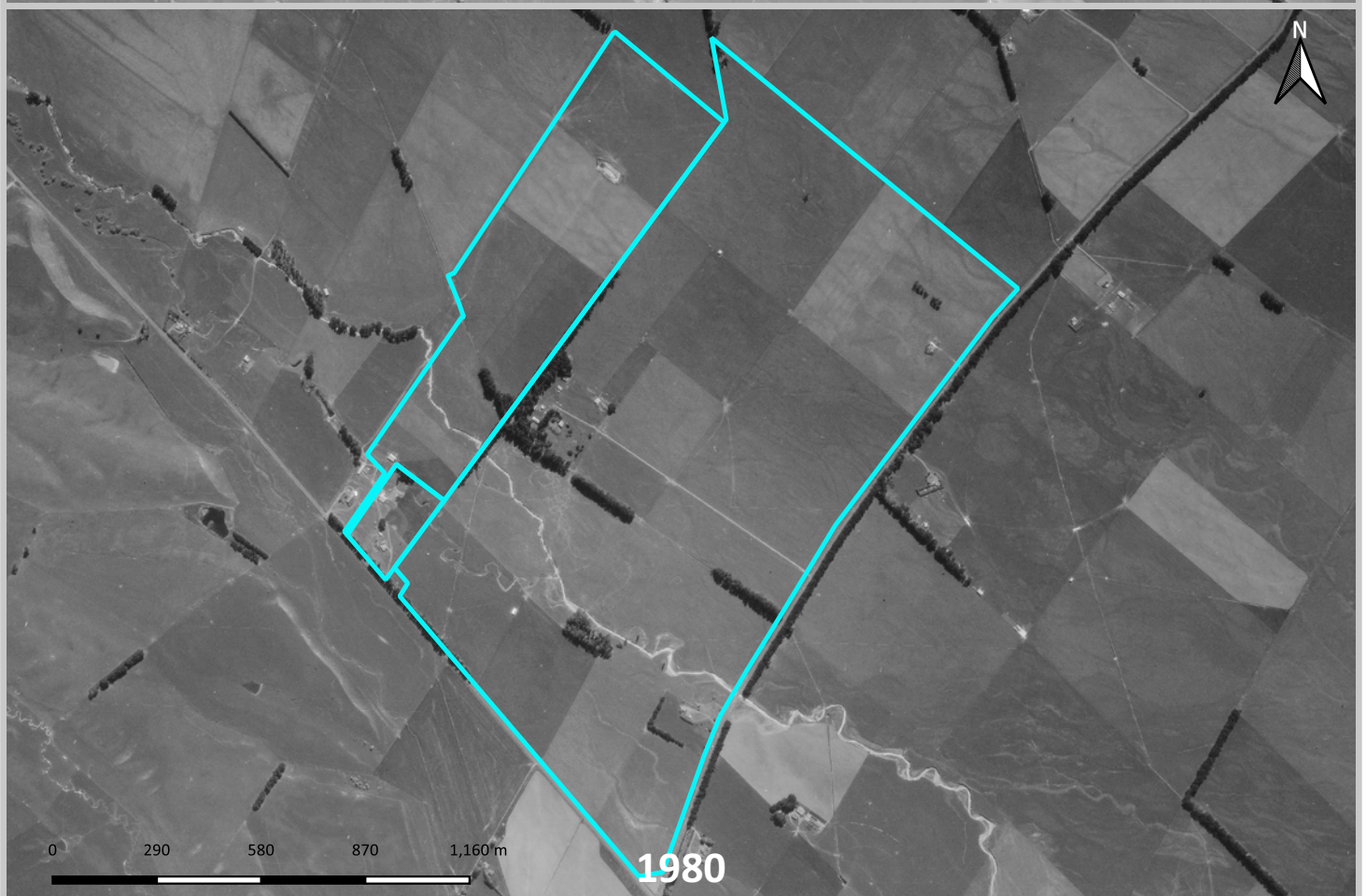
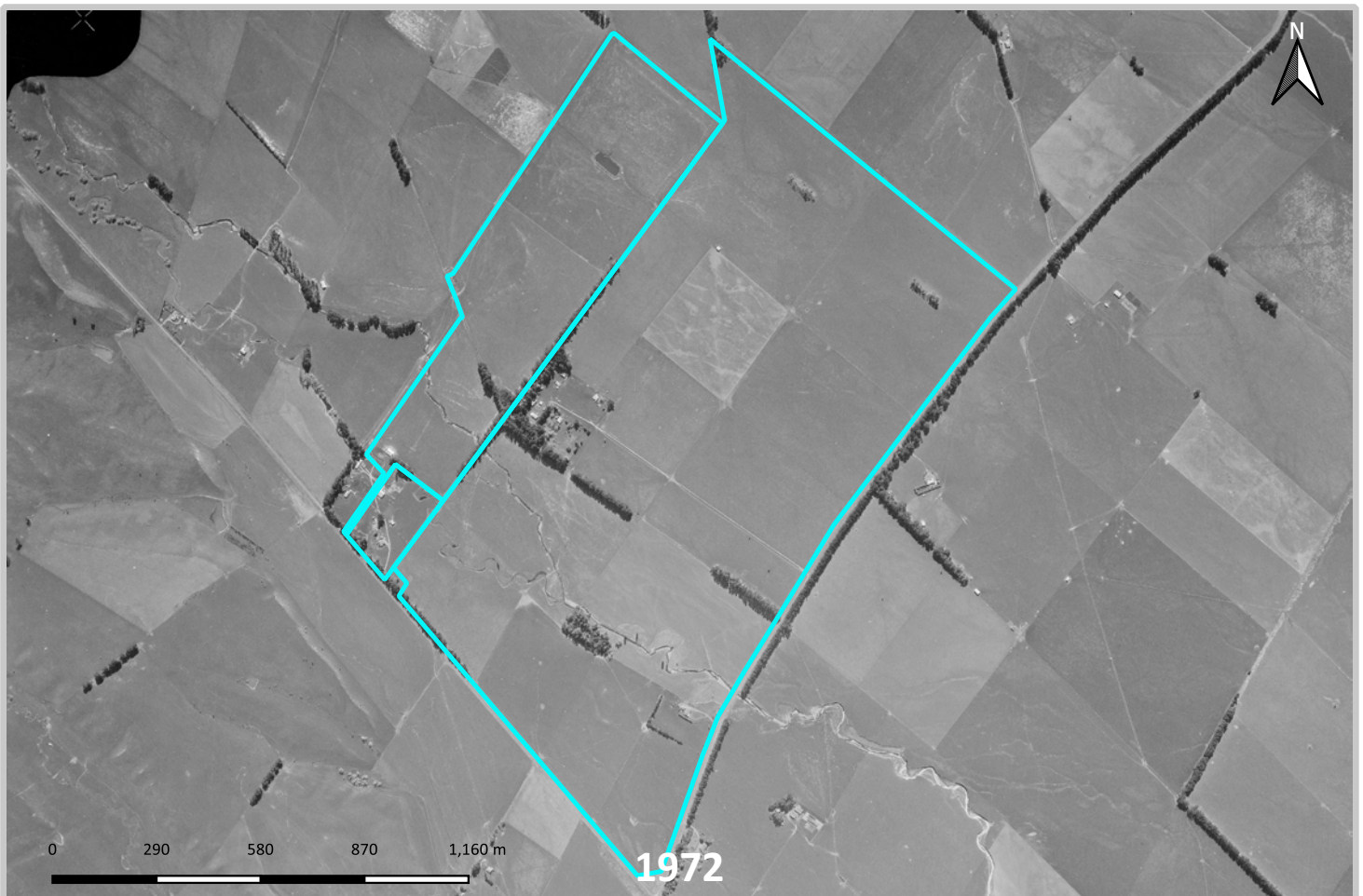
Interests

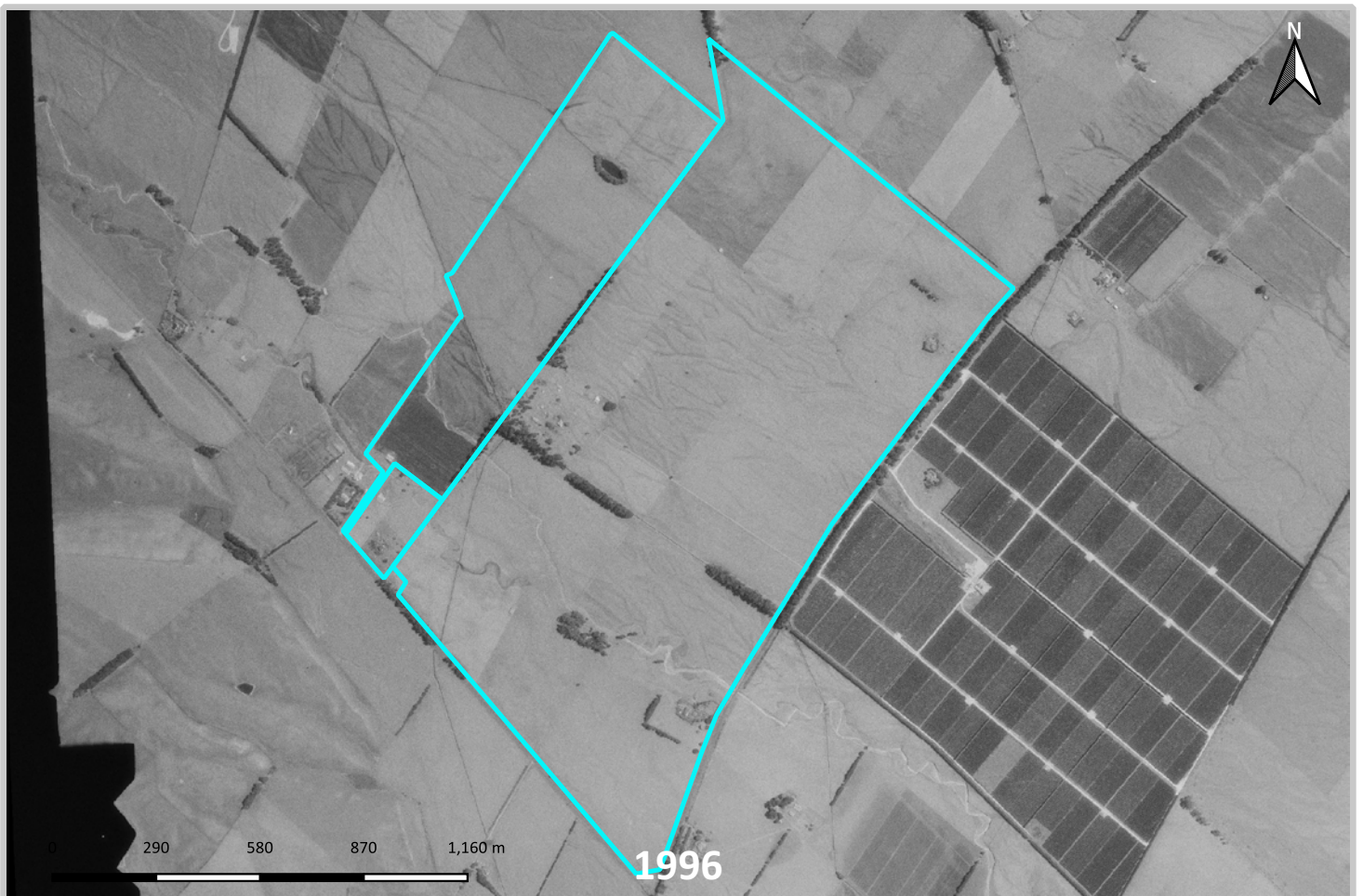
5731624.1 Gazette Notice declaring adjoining State Highway 50 to be a Limited access road- 17.9.2003 at 9:00 am
5744406.4 Notice pursuant to Section 91 Transit New Zealand Act 1989 - 26.9.2003 at 9:00 am
5744449.1 Notice pursuant to Section 91 Transit New Zealand Act 1989 - 26.9.2003 at 9:00 am
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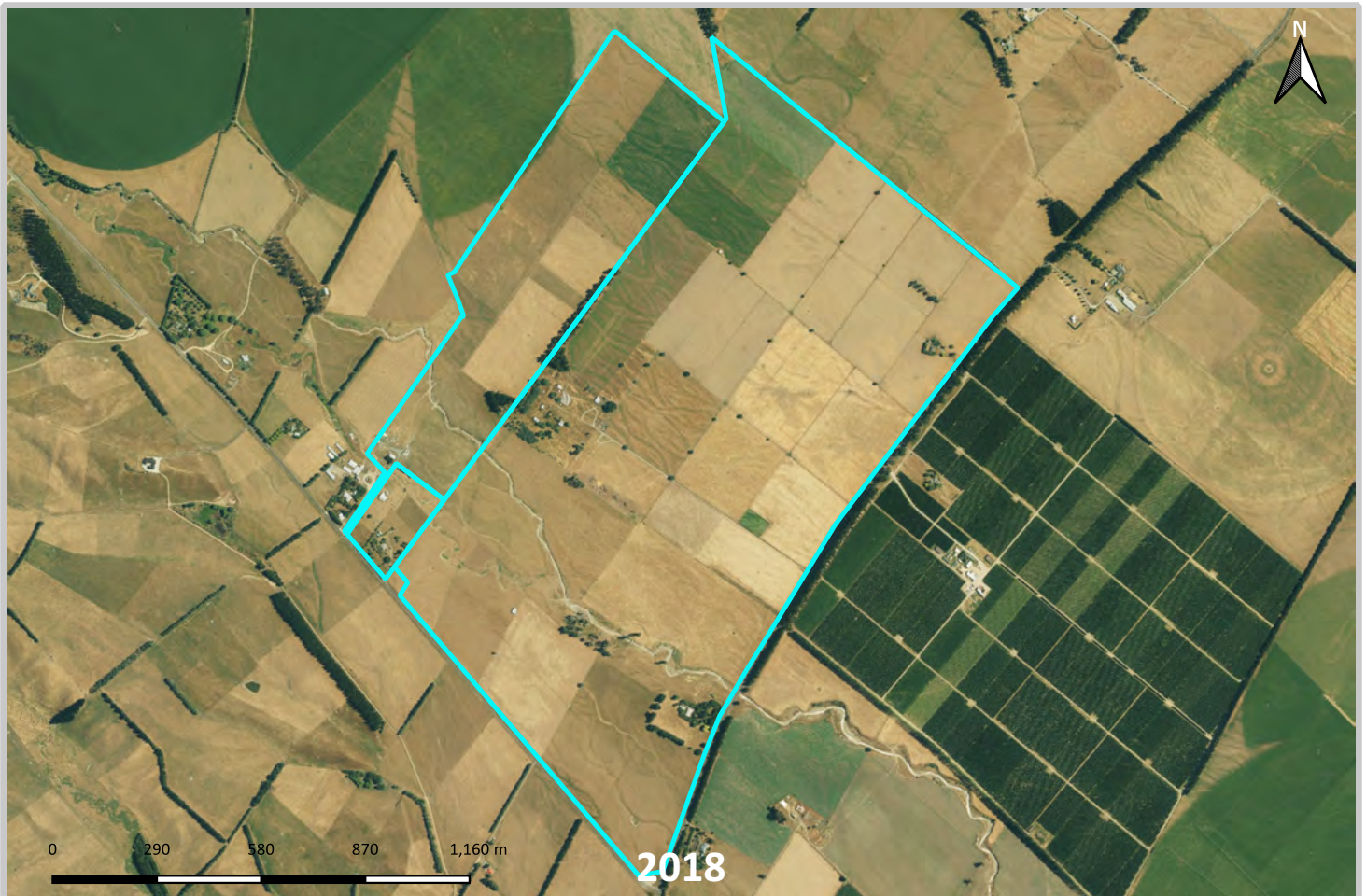


APPENDIX C HISTORIC AERIAL PHOTOGRAPHS









APPENDIX D

SITE PHOTOGRAPHS



PLATE 1: Former sheep dip location, now modified sorting race.



PLATE 2: Interior of sorting race / former sheep dip.



PLATE 3: Eastern extent of yards immediately adjacent to former dip location.



PLATE 4: Northern edge of races and pens attached to dip, locations of SS1 and SS2 in top left of plate by Woolshed exit.



PLATE 5: Edge of woolshed and area of concrete showing different stages of concrete placement.



PLATE 6: Sheep slide exit from woolshed.



PLATE 7: Western Edge of woolshed showing different ages of corrugated iron and foundations in poor repair



PLATE 8: Farm dump and offal hole showing varying refuse deposition.



PLATE 9: Composition of Farm Dump.



PLATE 10: Pasture blocks of State Highway 50 Property.



PLATE 11: HAYBARN IN POOR CONDITION, LOCATION OF SS49 ADJACENT TO WALL.



PLATE 12: Empty above ground storage tanks adjacent to pre 1960's shed.



PLATE 13: Example of aged sheds within State Highway 50 block. .



PLATE 14: Modern Yard area on Wakarara Road.

APPENDIX E LABORATORY TRANSCRIPTS



Certificate of Analysis

Geosciences Ltd
PO Box 35366, Browns Bay
Auckland 0753

Attention: Carl O'Brien
Phone: 09 475 0222
Email: carl@geosciences.co.nz

Sampling Site: Wakarara Road

Lab Reference: 21-12724
Submitted by: Carl O'Brien
Date Received: 19/03/2021
Testing Initiated: 19/03/2021
Date Completed: 24/03/2021
Order Number:
Reference: JH0151

Report Comments

Samples were collected by yourselves (or your agent) and analysed as received at Analytica Laboratories. Samples were in acceptable condition unless otherwise noted on this report. Specific testing dates are available on request.

Hort Suite in Soil

Client Sample ID			SS1 0-150mm	SS2 0-150mm	SS3 0-150mm	SS4 0-150mm	SS5 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-1	21-12724-2	21-12724-3	21-12724-4	21-12724-5
Arsenic	mg/kg dry wt	0.125	12	15.7	16.9	5.3	23.0
Copper	mg/kg dry wt	0.075	29.7	46.5	34.4	17.7	36.3
Lead	mg/kg dry wt	0.25	26.3	17.5	17.7	12.8	15.3

Hort Suite in Soil

Client Sample ID			SS6 0-150mm	SS7 0-150mm	SS8 0-150mm	SS9 0-150mm	SS10 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-6	21-12724-7	21-12724-8	21-12724-9	21-12724-10
Arsenic	mg/kg dry wt	0.125	23.2	138	76.8	13.3	11
Copper	mg/kg dry wt	0.075	38.3	41.8	26.6	31.1	20.4
Lead	mg/kg dry wt	0.25	18.9	19.9	13.6	15.5	12.1

Hort Suite in Soil

Client Sample ID			SS11 0-150mm	SS12 0-150mm	SS16 0-150mm	SS17 0-150mm	SS22 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-11	21-12724-12	21-12724-16	21-12724-17	21-12724-22
Arsenic	mg/kg dry wt	0.125	30.8	5.5	901	382	63.4
Copper	mg/kg dry wt	0.075	24.9	19.0	198	138	25.7

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation with the exception of tests marked *, which are not accredited.
This test report shall not be reproduced except in full, without the written permission of Analytica Laboratories.

Hort Suite in Soil

Client Sample ID			SS11 0-150mm	SS12 0-150mm	SS16 0-150mm	SS17 0-150mm	SS22 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Lead	mg/kg dry wt	0.25	17.3	11.4	19.2	38.0	86.6

Elements in Soil

Client Sample ID			SS13 0-150mm	SS14 0-150mm	SS15 0-150mm	SS18 0-150mm	SS19 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-13	21-12724-14	21-12724-15	21-12724-18	21-12724-19
Lead	mg/kg dry wt	0.25	348	158	82.0	27.6	91.9

Elements in Soil

Client Sample ID			SS20 0-150mm	SS21 0-150mm	SS23 0-150mm	SS24 0-150mm	SS25 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-20	21-12724-21	21-12724-23	21-12724-24	21-12724-25
Lead	mg/kg dry wt	0.25	19.3	37.1	626	190	99.6

Elements in Soil

Client Sample ID			SS26 0-150mm	SS27 0-150mm	SS28 0-150mm	SS29 0-150mm	SS30 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-26	21-12724-27	21-12724-28	21-12724-29	21-12724-30
Lead	mg/kg dry wt	0.25	230	34.1	52.3	31.4	281

Elements in Soil

Client Sample ID			SS32 0-150mm	SS35 0-150mm	SS36 0-150mm	SS37 0-150mm	SS38 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-32	21-12724-35	21-12724-36	21-12724-37	21-12724-38
Lead	mg/kg dry wt	0.25	6,410	92.3	55.1	14.7	20.9

Elements in Soil

Client Sample ID			SS39 0-150mm	SS40 0-150mm	SS41 0-150mm	SS42 0-150mm	SS43 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-39	21-12724-40	21-12724-41	21-12724-42	21-12724-43
Lead	mg/kg dry wt	0.25	27.4	43.9	1,190	4,240	2,770

Elements in Soil

Client Sample ID			SS44 0-150mm	SS45 0-150mm	SS46 0-150mm	SS47 0-150mm	SS48 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-44	21-12724-45	21-12724-46	21-12724-47	21-12724-48
Lead	mg/kg dry wt	0.25	66.2	729	269	128	83.6

Elements in Soil

Client Sample ID			SS49 0-150mm
Date Sampled			17/03/2021
Analyte	Unit	Reporting Limit	21-12724-49
Lead	mg/kg dry wt	0.25	22.9

Heavy Metals in Soil

Client Sample ID			SS31 0-150mm	SS33 0-150mm	SS34 0-150mm	SS50 0-150mm	SS51 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-31	21-12724-33	21-12724-34	21-12724-50	21-12724-51
Arsenic	mg/kg dry wt	0.125	22.3	14.9	14.9	9.1	8.3
Cadmium	mg/kg dry wt	0.005	0.726	0.609	1.55	0.45	0.21
Chromium	mg/kg dry wt	0.125	19.5	27.1	22.8	16.0	18.1
Copper	mg/kg dry wt	0.075	20.6	58.2	33.1	19.9	20.8
Lead	mg/kg dry wt	0.25	1,610	178	185	93.8	23.2
Nickel	mg/kg dry wt	0.05	8.22	14.7	52.2	14.2	8.07
Zinc	mg/kg dry wt	0.05	1,440	502	413	322	129

Organochlorine Pesticides - Soil

Client Sample ID			SS1 0-150mm	SS2 0-150mm	SS3 0-150mm	SS4 0-150mm	SS5 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-1	21-12724-2	21-12724-3	21-12724-4	21-12724-5
2,4'-DDD	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
2,4'-DDE	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
2,4'-DDT	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
4,4'-DDD	mg/kg dry wt	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
4,4'-DDE	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
4,4'-DDT	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total DDT	mg/kg dry wt	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
alpha-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Aldrin	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
beta-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-Chlordane	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-Nonachlor	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
delta-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dieldrin	mg/kg dry wt	0.05	<0.05	0.06	0.08	<0.05	0.07
Endosulfan I	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Endosulfan II	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulfan sulfate	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Endrin	mg/kg dry wt	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin ketone	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
gamma-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor epoxide	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Hexachlorobenzene	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Methoxychlor	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-nonachlor	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlordane (sum)	mg/kg dry wt	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
TCMX (Surrogate)	%	1	98.9	99.9	102.0	103.0	104.4

Organochlorine Pesticides - Soil

Client Sample ID			SS6 0-150mm	SS7 0-150mm	SS8 0-150mm	SS9 0-150mm	SS10 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-6	21-12724-7	21-12724-8	21-12724-9	21-12724-10
2,4'-DDD	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
2,4'-DDE	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
2,4'-DDT	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
4,4'-DDD	mg/kg dry wt	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
4,4'-DDE	mg/kg dry wt	0.005	0.015	0.008	<0.005	0.013	<0.005
4,4'-DDT	mg/kg dry wt	0.005	0.007	<0.005	<0.005	<0.005	<0.005
Total DDT	mg/kg dry wt	0.02	0.02	<0.02	<0.02	<0.02	<0.02
alpha-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Aldrin	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
beta-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-Chlordane	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-Nonachlor	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
delta-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dieldrin	mg/kg dry wt	0.05	0.16	0.09	<0.05	0.07	<0.05
Endosulfan I	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Endosulfan II	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulfan sulfate	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Endrin	mg/kg dry wt	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin ketone	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
gamma-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor epoxide	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Hexachlorobenzene	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Methoxychlor	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-nonachlor	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlordane (sum)	mg/kg dry wt	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
TCMX (Surrogate)	%	1	103.9	102.0	101.8	99.0	98.8

Organochlorine Pesticides - Soil

Client Sample ID			SS11 0-150mm	SS12 0-150mm	SS16 0-150mm	SS17 0-150mm	SS22 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-11	21-12724-12	21-12724-16	21-12724-17	21-12724-22
2,4'-DDD	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
2,4'-DDE	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
2,4'-DDT	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
4,4'-DDD	mg/kg dry wt	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
4,4'-DDE	mg/kg dry wt	0.005	0.007	<0.005	<0.005	<0.005	0.009
4,4'-DDT	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total DDT	mg/kg dry wt	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
alpha-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Aldrin	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
beta-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-Chlordane	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-Nonachlor	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
delta-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dieldrin	mg/kg dry wt	0.05	<0.05	<0.05	<0.05	0.14	<0.05
Endosulfan I	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Endosulfan II	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Organochlorine Pesticides - Soil

Client Sample ID			SS11 0-150mm	SS12 0-150mm	SS16 0-150mm	SS17 0-150mm	SS22 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Endosulfan sulfate	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Endrin	mg/kg dry wt	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin ketone	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
gamma-BHC	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor epoxide	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Hexachlorobenzene	mg/kg dry wt	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Methoxychlor	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-nonachlor	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlordane (sum)	mg/kg dry wt	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
TCMX (Surrogate)	%	1	102.4	104.0	100.6	102.7	101.5

Polycyclic Aromatic Hydrocarbons - Soil

Client Sample ID			SS31 0-150mm	SS33 0-150mm	SS34 0-150mm	SS50 0-150mm	SS51 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-31	21-12724-33	21-12724-34	21-12724-50	21-12724-51
1-Methylnaphthalene	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.011
2-Methylnaphthalene	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Acenaphthene	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Acenaphthylene	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Anthracene	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Benz[a]anthracene	mg/kg dry wt	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo[a]pyrene	mg/kg dry wt	0.01	0.02	<0.01	<0.01	<0.01	<0.011
Benzo[b] & [j] fluoranthene	mg/kg dry wt	0.02	0.03	<0.02	<0.02	<0.02	<0.02
Benzo[g,h,i]perylene	mg/kg dry wt	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo[k]fluoranthene	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Chrysene	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Dibenz(a,h)anthracene	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Fluoranthene	mg/kg dry wt	0.02	0.03	<0.02	<0.02	<0.02	<0.02
Fluorene	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Indeno(1,2,3-cd)pyrene	mg/kg dry wt	0.01	0.01	<0.01	<0.01	<0.01	<0.011
Naphthalene	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Phenanthrene	mg/kg dry wt	0.01	<0.01	<0.01	<0.01	<0.01	<0.011
Pyrene	mg/kg dry wt	0.02	0.04	<0.02	<0.02	<0.02	<0.02
Benzo[a]pyrene TEQ (LOR)	mg/kg dry wt	0.03	0.04	0.03	0.03	0.03	0.03
Benzo[a]pyrene TEQ (Zero)	mg/kg dry wt	0.01	0.03	<0.01	<0.01	<0.01	<0.01
Anthracene-d10 (Surrogate)	%	1	114.2	114.8	122.0	124.3	125.3

Moisture Content

Client Sample ID			SS31 0-150mm	SS33 0-150mm	SS34 0-150mm	SS50 0-150mm	SS51 0-150mm
Date Sampled			17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Analyte	Unit	Reporting Limit	21-12724-31	21-12724-33	21-12724-34	21-12724-50	21-12724-51
Moisture Content	%	1	24	17	29	32	34

Method Summary

Elements in Soil	Samples dried and passed through a 2 mm sieve followed by acid digestion and analysis by ICP-MS. In accordance with in-house procedure based on US EPA method 200.8.
OCP in Soil	Samples are extracted with hexane, pre-concentrated then analysed by GC-MSMS. (Chlordane (sum) is calculated from the main actives in technical Chlordane: Chlordane, Nonachlor and Heptachlor). (In accordance with in-house procedure).
Total DDT	Sum of DDT, DDD and DDE (4,4' and 2,4 isomers)
PAH in Soil	Solvent extraction, silica cleanup, followed by GC-MS analysis. Benzo[a]pyrene TEQ (LOR): The most conservative TEQ estimate, where a result is reported as less than the limit of reporting (LOR) the LOR value is used to calculate the TEQ for that PAH. Benzo[a]pyrene TEQ (Zero): The least conservative TEQ estimate, PAHs reported as less than the limit of reporting (LOR) are not included in the TEQ calculation. Benzo[a]pyrene toxic equivalence (TEQ) is calculated according to ' <i>Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health</i> '. Ministry for the Environment. 2011. (In accordance with in-house procedure).
Moisture	Moisture content is determined gravimetrically by drying at 103 °C.



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