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solutions for your environment

14 July 2022

Jocelyn Lewes
Strategy and Policy Planner
Selwyn District Council
PO Box 90
ROLLESTON 7643

Dear Jocelyn

PRELIMINARY SITE INVESTIGATION – LOT 2 DP 61162, SPRINGSTON ROLLESTON ROAD, ROLLESTON, SELWYN DISTRICT

1.0 Introduction

Pattle Delamore Partners Limited (PDP) has been engaged by Selwyn District Council (SDC) to undertake a preliminary site investigation (PSI) for the property legally described as Lot 2 DP 61162 located on Springston Rolleston Road, Rolleston (i.e., the site). The attached Figure 1 defines the extent of the site subject to this assessment.

The PSI was carried out to gain an understanding of potential ground contamination sources and support the proposed rezoning of the site and wider area within Selwyn District as part of the Future Urban Development Area (FUDA) programme. The PSI is also intended to assist SDC with the variation of the Proposed District Plan, particularly with regards to future compliance assessments relating to land use activities covered by the *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soils to Protect Human Health) Regulations 2011* (the NESCS).

The PSI has been undertaken through the review of available site information including review of district and regional council records, property file records, aerial photographs and previous investigation reports, as well as undertaking a site inspection and interviews to identify areas of the site where HAIL[1] activities may have been undertaken.

This assessment has been carried out in accordance with Ministry for the Environment's (MfE) *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand (Revised 2021)* (MfE, 2021). The investigation has been certified by suitably qualified and experienced practitioners (SQEP) as outlined by the NESCS. A certifying statement to this effect is attached.

[1] Hazardous Activities and Industries List (HAIL; MfE 2011). The HAIL is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal. The HAIL is intended to identify most situations in New Zealand where hazardous substances could cause, and in many cases have caused, land contamination.

2.0 Site Details

The site currently comprises vacant paddocks used for animal grazing. A disused farm shed is located in the eastern portion, while a vacant garage is present in the northern part. An area along the northern site boundary is used for temporary soil storage for the adjacent Silverstream subdivision development to the immediate north of the site.

The site identification and environmental setting are summarised in Tables 1 and 2 below. An aerial photograph of the site is attached as Figure 1.

Table 1: Site Identification

Address	Legal Description	Lot Area (m^2)	Current Land Use	Current Owner
No associated physical address	Lot 2 DP 61162	159,235	Vacant paddocks	CJFA Holdings Limited

Table 2: Environmental Setting	
Zoning	'Inner Plains' as per the Operative Selwyn District Plan 'General Rural Zone' as per Proposed Selwyn District Plan
Future Land Use	Potentially residential subdivisions
Immediate Surrounding Land Uses	The site is bordered by Springston Rolleston Road to the east, the Silverstream residential subdivision, under construction, to the north and a residential subdivision to the northwest. The areas to the west, southwest and south are currently undeveloped rural land (grazing paddocks), although it is understood that these areas are earmarked for residential subdivision in the near future.
Topography[1]	Generally flat and level.
Site Services	The Canterbury Maps GIS database show the site is not connected to the council's reticulated network. The database however also shows the rapidly expanding services network given the completed and ongoing residential subdivision work in the immediate vicinity of the site. During the site inspection, a concrete stormwater sump/manhole, likely used as a soakhole was observed along the north eastern site boundary. A water tank and a pump shed structure were present in the north eastern part of the site although this was not inspected during the recent PDP site visit due to access constraints (see Section 4.0).
Regional Geology	Brownish-grey river alluvium and grey river alluvium beneath plains or low-level terrace[1].
Hydrogeology	Information obtained from Environment Canterbury's (ECan) GIS database indicates that the groundwater level beneath the site and immediate surrounding area to be at least 5 m below ground level (bgl) (based on recorded initial water level measurements of bores in the area) and is expected to flow in a general south easterly direction. The GIS database shows that a bore (M36/2762) is present in the central part of the site which is likely connected to the water tank and pump shed present in the north eastern part. The GIS database recorded this bore as being currently 'not used' for irrigation purposes and there is no data available regarding drilling and construction details. The bore is registered under the ownership of Thom C.N. & S.M. Of note, the GIS database recorded two bores located approximately 10 m north of the site boundary in the neighbouring property, including an 'active (exist, present)' irrigation bore screened between 11 and 14 m bgl (M36/1853) and a 'filled in' bore for domestic and stockwater purposes (M36/4481). Within a 1 km radius of the site, the GIS database indicates presence of 75 registered bores of which 52 are currently recorded as being 'active' and used for a range of purposes including domestic, irrigation and/or stockwater supply. The remaining 23 bores are recorded as being either not used, not drilled, capped or expired bore consent. A plot and table showing the recorded bores within a 1 km radius of the site is attached.
Ecological Receptors (within 500 m)	There does not appear to be a natural surface water body in the immediate vicinity, although it is noted that due to the rural nature of the general area, several stock water races are present in the immediate vicinity of the site; the nearest of which is located along the eastern boundary of the neighbouring property/Springston Rolleston Road (see Section 4.0). In addition, several stormwater treatment reserve/basin areas are present in the wider vicinity of the site as part of the completed residential subdivision works.

Notes:

1. *Geology of the Christchurch Area, GNS, 2008 (1:250,000 scale).*

3.0 Desktop Review of Site History

A desktop review of available information has been undertaken to understand past and present land use activities at the site which could potentially result in ground contamination sources. The following information was obtained and reviewed in order to establish the history of the site:

- Historical aerial photographs;
- ECan Listed Land Use Register (LLUR);
- Property file records from Selwyn District Council;
- Previous investigation report; and
- Site inspection and interview with the current landowner.

3.1 Historical Aerial Photographs

Selected historical aerial photographs from between 1942 and 2021 have been reviewed for the site, and these photographs have been sourced from Canterbury Map Partners administered by ECan. The historical aerial photographs reviewed are attached. Note that the review of the aerial photographs was carried out on the electronic versions, which provides a higher resolution compared with the printed versions appended.

In summary, the aerial photographs review showed that:

- The 1942, 1961, 1974 and 1982 aerial images show the site to be vacant paddocks, likely used for animal grazing. There is no observable presence of any farm related structures such as animal yards, sheds or pest treatment facilities (e.g., sheep dip structures). The immediate surrounding land use also appears to comprise vacant paddocks, likely used for animal grazing.
- The 1994 aerial photograph shows the presence of a partially fenced farm shed within the eastern portion. Based on location, this is expected to be the same shed that remains present at the site, albeit now disused. No major change has occurred across the remainder of the site, and immediately adjacent land, although some division/separation between different paddocks is evident.
- The 2004 aerial photograph shows that a small shed has been constructed in the north eastern portion (to the immediate north of a row of trees) as well as another small building structure in the northern portion. These are consistent with the location of the water tank and pump shed and disused garage observed during the recent PDP site inspection.
- The 2012 aerial photograph shows that the fence around the farm shed had been mostly removed. Little has changed across the remainder of the site and immediately adjacent land.
- The 2021 aerial photograph shows the site in its present-day configuration. Residential development is evident to the east over Springston Rolleston Road and to the northwest.

3.2 Review of Environment Canterbury Records

3.2.1 Listed Land Use Register (LLUR)

An online search was made via ECan for information from their Listed Land Use Register (LLUR) on 26 April 2022. The Register is used to hold information about sites that have used, stored or disposed of hazardous substances, based on activities detailed on the HAIL (MfE, 2011). It should be noted that the LLUR is not complete and new sites are regularly being added as ECan receives information and conduct their own investigations into current and historical land uses.

In summary, the site is not listed on the LLUR (i.e., no known HAIL activity). A copy of the LLUR is attached.

3.2.2 Resource Consents

A review of resource consents within the ECan GIS database shows the site does not hold any active resource consent from ECan. The GIS database recorded that the site held a resource consent to take groundwater for irrigation (CRC917125) between 1991 and 1997 under Mr & Mrs C.N & S.M. Thom. This consent was subsequently renewed (CRC917125.1) by the succeeding site owner CJFA Holdings Limited (current owner) and expired in 2001. There is no other historical consent recorded for the site in the ECan GIS database.

A plot showing resource consents within a 1 km radius of the site is attached.

3.3 Review of Selwyn District Council Property Records

The property file record for the site was obtained from SDC and reviewed. Given the limited land use at the site, the files obtained were limited to building consent information relating to the construction of the farm shed in 1991 and the construction of the garage in 1995. No other information relevant to potential ground contamination sources was available.

A copy of the relevant property file information is attached.

3.4 Previous Investigation

Wiley Geotechnical Limited (WGL) undertook a detailed environmental site investigation (DSI) for the site in June 2022. The DSI was completed for Kevler Developments Limited (Kevler) to assist with the proposed residential subdivision of the site and followed on from the findings of the PSI undertaken by WGL in 2021. A copy of the DSI report was provided to PDP for review, but the PSI report was not available although a summary was included in the DSI. The key findings of the WGL (2022) DSI are summarised below:

- The PSI (WGL, 2021) identified three HAIL activities across the site based on the review of site history, including HAIL Reference A1 (*agrichemicals including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application*) associated with the use of fertiliser at the site, HAIL Reference G4 (*scrap yards including automotive dismantling, wrecking or scrap metal yards*) associated with tyre storage in and around the garage, and HAIL Reference G5 (*waste disposal to land*) associated with a green waste pile on site. While three HAIL activities were identified, the PSI concluded that the NESCS will be applicable to a 'risk area' associated with the storage of tyres (i.e. HAIL G4) undertaken adjacent to the north of the garage given the potential of this activity to cause soil contamination and pose potential risk to human health.
- The DSI (WGL, 2022) involved the collection of two samples (SS01 and SS02) between the ground surface and 0.2 m bgl in the 'risk area' and analysed for heavy metals and polycyclic aromatic hydrocarbon (PAH) compounds. Both samples contained heavy metals and PAH compounds below the adopted background concentrations as well as the assessment criteria for residential (10% produce) and commercial/industrial (future development workers) land uses.
- The DSI (WGL, 2022) concluded that based on the contamination status of the site, it was considered highly unlikely that there will a risk to human health from chemical contamination of the new residential development if activities, including subdividing, developing for residential use, and future occupation of residential dwellings, are done on the piece of land.
- The DSI (WGL, 2022) recommended that the residential development of the land be allowed as a Controlled Activity under the NESCS. PDP notes that this recommendation is not consistent with the provisions of Regulation 5(9) which states that the *NESCS will not apply where a DSI exists that demonstrates that any contaminants in or on the piece of land are at or below background concentrations*, as has been already shown by the WGL (2022) DSI.

A copy of the WGL (2022) DSI is attached.

4.0 Site Inspection

A site inspection was carried out by a PDP Environmental Scientist on 10 June 2022 to understand the current land use activities within the site. Photographs taken during the site inspection are attached.

In summary, the findings of the site inspection and discussion showed that:

- The current site layout was generally consistent with that observed in the 2021 aerial imagery. The site was predominantly vacant paddocks with wrapped hay bales present across the site. The redundant/disused farm shed remained present in the eastern portion of the site and constructed with timber framing and corrugated metal sheets wall cladding, with no obvious asbestos containing material (ACM) observed.
- The disused garage was also present in the northern portion. The garage was of metal construction with no obvious ACM observed. Metal pipes and a tyre were observed to the north of the garage, although the full extent of materials stored could not be confirmed due to overgrown vegetation present. The presence of the tyre was consistent with the observations made by WGL in their DSI report (WGL, 2022).
- An area along the northern site boundary was used for temporary soil storage for the neighbouring Silverstream subdivision to the north of the site, which was being developed by Kevler. The Operations Manager of Kevler (pers. comm. Rob Preston) confirmed that soils temporarily stored in this area only included cleanfill materials (sands and gravels) and topsoil.
- A water tank and a pump shed were observed located in a locked area in the north eastern area. The presence of the bore could not be confirmed due to the overgrown ground condition and access restriction in this part of the site.
- There was no obvious indication of contamination sources, such as anthropogenic waste, stained/odorous soils or stressed vegetation, observed on the ground surface or on stockpiled soils during the inspection. Similarly, there was no evidence of use and/or bulk storage of chemicals such as pesticides or fuel within the site. Of note, the *green waste pile* and *fertiliser use* indicated by WGL in their 2022 DSI report was not observed by PDP therefore could not be confirmed.

5.0 Summary of Site History and Potential Contamination Sources

The reviewed historical information showed that the site comprised undeveloped/vacant paddocks since at least the 1940s and remained as such until the present day. A small farm shed and a garage were constructed in the early 1990s but are now disused on the site.

The site is not listed on the ECan LLUR. The site does not hold any resource consent indicative of any potentially contaminating activities or contamination sources. The available property files from SDC were limited to the construction of the farm shed and the garage at the site.

The recent PDP site inspection confirmed the existing layout of the site to be vacant paddocks and the presence of the disused shed and garage. In addition, an area along the northern site boundary was observed to be used for temporary storage of topsoil and cleanfill material, which reportedly originated from the neighbouring Silverstream subdivision development to the north. Metal pipes and a tyre were observed in the overgrown area outside of the garage. Building materials observed in the disused shed and garage were mainly timber and metal sheets with no obvious/suspected ACM. There was no obvious indication of contamination sources, such as anthropogenic waste, stained/odorous soils or stressed

vegetation, observed on the ground surface or on stockpiled soils during the inspection. Similarly, there was no evidence of use and/or bulk storage of chemicals such as pesticides or fuel.

A recent investigation, including a PSI (2021) and DSI (2022) was undertaken by WGL for Kevler to assist with the proposed residential subdivision development of the site. While a copy of the PSI (WGL, 2021) was not available for review, the DSI (WGL, 2022) provided a brief summary, which indicated the presence of three HAIL activities within the site relating to the use of fertiliser at the site (HAIL Reference A1), tyre storage in and around the garage (HAIL Reference G4) and a pile of green waste (HAIL Reference G5).

However, the PSI (WGL, 2022) concluded that only the storage of tyres could pose a potential risk to human health (see additional commentary below regarding HAIL references A1 and G5), thus becoming the focus of the subsequent DSI, which involved the collection of two surface soil samples beneath the tyre storage area. The sample results showed heavy metals and PAH compounds below the adopted background levels and below the applicable standards/guidelines for residential and commercial/industrial land uses. The DSI concluded that soil contaminants at the site were considered highly unlikely to pose a potential risk to human health. WGL recommended that residential development of the site be allowed as a controlled activity under the NESCS. Although PDP notes this was not consistent with the provisions of Regulation 5(9) relating to the non-applicability of the NESCS, based on DSI findings showing contaminant concentrations at or around background levels, as were the findings of the WGL (2022) DSI.

Therefore, based on the reviewed information, the balance of evidence shows that HAIL activities are not considered to have been undertaken within the site and the presence of land contamination that would pose a potential risk to human health is **highly unlikely**.

5.1 Additional Commentary on HAIL A1 and G5

As the copy of WGL (2021) PSI report was not available, PDP was unable to confirm the basis for the exclusion of the two HAIL activities (i.e. HAIL A1 and HAIL G5) in the DSI. Irrespective of this, PDP agrees with the conclusion that only the tyre storage activity has the higher potential to cause ground contamination. However, it should be noted that the original classification in the WGL PSI report for tyre storage as HAIL activity G4 (*Scrap yards including automotive dismantling, wrecking or scrap metal yards*) does appear to be a very conservative approach, as there does not appear to be any evidence of vehicle dismantling or scrap yard activities within the site.

Furthermore, PDP considers that HAIL activity A1 (*Agrichemicals including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application*) has not occurred at the site based on our review of the available information, and in particular the likely use of the onsite buildings for commercial agrichemical purposes.

Similarly, PDP does not consider 'green waste' to be HAIL activity G5. The intention of HAIL Category G5 is to capture anthropogenic type wastes as opposed to vegetative type wastes (excluding those that undergo chemical treatment such as treated timber, which is not the case at this site).

6.0 Conceptual Site Model (CSM)

For a risk to human health to exist there has to be a hazard (in this case, a source of contaminated soil), a receptor (e.g., people) and an exposure pathway (e.g., ingestion of soil) linking the hazard and the receptor. An absence of any one of these components means that the source to receptor linkage is incomplete and therefore there is unlikely to be a risk to the receptor. A CSM is designed to identify the hazards, receptors and possible links between these.

As previously discussed in Section 5.0, HAIL activities were not considered to have been undertaken at the site based the available information regarding past and present land use activities and recent soil data quality obtained though the WGL (2022) DSI. As such, there are no potential contamination sources and

the linkage between the source-receptor-pathway is incomplete. Therefore, it is highly unlikely that there will be a risk to human health and the environment should any land use activities be carried out within the site in the future (e.g., residential land use).

7.0 Provisions of the NESCS

The NESCS seeks to control activities on contaminated land so as to protect human health. The regulations apply to land, which is described as having, has had or is more likely than not to have had an activity or industry described in the HAIL undertaken on it and if a person wants to do an activity described in sub-clauses (2) to (6) of regulation 5, including removal/replacement of fuel storage system, sampling of soil, disturbance of soil, change of land use and land subdivision.

As previously discussed in Section 5.0, it is highly unlikely that the previously identified HAIL activities have caused land contamination that would pose a risk to human health. This is further re-enforced in the CSM assessment (Section 6.0), which showed there is an incomplete linkage to the receptor given the absence of potential contamination sources. Therefore, under regulation 5(1)(b), the requirements of the NESCS are considered **not applicable** should any of the activities covered by the regulation be undertaken within the site. These activities include the future residential subdivision of the site as a result of the proposed re-zoning and district plan changes.

8.0 Summary and Conclusions

PDP has undertaken a PSI (site history review) for the property legally described as Lot 2 DP 61162 located on Springston Rolleston Road, Rolleston. The PSI was carried out to gain an understanding of land use practices that may result in potential ground contamination sources and to support the proposed rezoning of the site and wider area within Selwyn District as part of the Future Urban Development Area (FUDA) programme. The PSI was also intended to assist SDC with the variation of the Proposed District Plan particularly with regards to future compliance assessments relating to land use activities covered by the NESCS.

In summary, the reviewed information showed that:

- Review of aerial imagery showed the site largely comprised vacant paddocks used for animal grazing from at least the early 1940s. A farm shed and a garage were constructed at the site in the 1990s but are now disused. Recent inspection of these buildings did not show obvious/suspected presence of ACM.
- Review of publicly available district council (property files) and regional council (LLUR, bores and consent records) documents did not show any evidence of potential contamination sources or potentially contaminating activities.
- Recent inspection of the site showed that the site remained as vacant paddocks. A water tank and pump shed were present in the north eastern area. In addition, an area along the northern site boundary was being used for temporary storage of topsoil and cleanfill materials originating from the neighbouring Silverstream subdivision development to the north. Inspection of these stockpiled materials, as well as the site ground surface did not show obvious signs of contamination, such as anthropogenic waste, stained/odorous soils or distressed vegetation. Similarly, there was no evidence of use and/or bulk storage of hazardous chemicals such as pesticides or fuel.
- A recent PSI (2021) and DSI (2022) was undertaken by WGL for Kevler to assist with the proposed residential subdivision development of the site. While a copy of the PSI was not available for review, the DSI summarised that three HAIL activities within the site were identified by WGL relating to the use of fertiliser at the site (HAIL Reference A1), tyre storage in and around the

garage (HAIL Reference G4) and pile of green waste (HAIL Reference G5). The PSI concluded that only the storage of tyres could pose a potential risk to human health, therefore, the subsequent DSI focused on this area, which involved the collection of two surface soil samples beneath the tyre storage area. The DSI concluded that soil contaminants at the site were highly unlikely to pose a risk to human health based on sample results showing heavy metals and PAH compounds below the adopted background levels and below the applicable standards/guidelines for residential and commercial/industrial land uses. The DSI recommended that residential development of the site be allowed as a controlled activity under the NESCS. Although PDP notes this recommendation was not consistent with the provisions of Regulation 5(9) relating to the non-applicability of the NESCS, based on DSI findings showing contaminant concentrations at or around background levels, as were the findings of the WGL (2022) DSI.

Therefore, based on the reviewed information, the balance of evidence shows that HAIL activities are not considered to have been undertaken within the site, and the presence of land contamination that would pose a risk to human health is **highly unlikely**. Furthermore, given the absence of any obvious contamination sources, the source-pathway-receptor linkage is assessed to be incomplete and therefore, there can be no risk to human health and the environment.

Finally, in the context of the proposed future re-zoning and district plan changes, the requirements of the NESCS are considered **not applicable** should any of the regulated activities be undertaken within the site.

9.0 References

Ministry for the Environment, 2011. *Hazardous Activities and Industries List (HAIL)*.

Ministry for the Environment, 2021. *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand (Revised 2021)*. Ministry for the Environment, Wellington.

Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

Wiley Geotechnical Limited, 2022. *Detailed Environmental Site Investigation – Harrow Green, Lot 2 DP 61162, Springston Rolleston Road, Rolleston* dated 7 June 2022. Prepared for Kevler Developments Limited.

10.0 Limitations

This letter has been prepared on the basis of information provided by Selwyn District Council and others (not directly contracted by PDP for the work) including Environment Canterbury and Wiley Geotechnical Limited. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the letter. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This letter has been prepared by PDP on the specific instructions of Selwyn District Council for the limited purposes described in the letter. PDP accepts no liability to any other person for their use of or reliance on this letter, and any such use or reliance will be solely at their own risk.

Owing to the limited nature of this assessment (as described in Section 1.0), there could be conditions at the site that have not been identified and which have not been considered in this letter. Although the assessment has shown no specific knowledge of sources of soil contamination, there is a risk that sources of soil contamination could exist that have not been identified by the assessment. This risk could be reduced by undertaking further research or subsoil investigation.

Yours faithfully

PATTLE DELAMORE PARTNERS LIMITED

Prepared by

Vivien Pan

Environmental Geologist/ Scientist

Reviewed by

Tracy Singson, CEnvP

Service Leader - Contaminated Land

Approved by

Guy Knoyle

Technical Director - Contaminated Land

Certifying Statement

I, Guy Knoyle, of Pattle Delamore Partners Limited certify that:

1. This preliminary site investigation meets the requirements of the *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011* (the NESCS) because it has been:
   a. done by a suitably qualified and experienced practitioner, and
   b. reported on in accordance with the current edition of *Contaminated land management guidelines No 1 – Reporting on contaminated sites in New Zealand*, and
   c. the report is certified by a suitably qualified and experienced practitioner.
2. This preliminary site investigation concludes that:

   No HAIL activities were identified to have occurred within the site subject to this assessment, therefore under Regulation 5(1)(b) the NESCS is not applicable. Furthermore, the recent DSI undertaken by WGL (2022) showed contaminant concentrations at or around background levels and therefore, the NESCS is not applicable pursuant to Regulation 5(9).

Evidence of the qualifications and experience of the suitably qualified and experienced practitioner(s) who have done this investigation and certified this report is provided below.

This certification applies to the date of this report.

Signed

Guy Knoyle
Technical Director – Contaminated Land

Guy Knoyle – Project Director

Guy is an environmental scientist with over 25 years of experience in undertaking environmental and contaminated land assessments. He has a BSc (Joint Honours) in Environmental Science and Zoology, and a MSc in Applied Hydrobiology, both from the University of Wales, College of Cardiff. Guy currently project manages contaminated land assessments and monitoring programmes for a diverse range of sites including commercial/industrial and largescale residential developments, former market gardens, horticultural and timber treatment sites, pesticide storage depots, landfills, the petroleum industry, former gas works sites and illicit methamphetamine laboratories, with experience attained over several hundred sites.

Guy has experience involved in a wide range of environmental issues, across a broad range of media including soil, sediment, surface water, groundwater, and ground gas; and for a wide range of contaminants including heavy metals, petroleum hydrocarbons, and asbestos.

Guy's knowledge has also allowed him to present technical evidence on behalf of various clients, as part of a multi-disciplinary team, at District Court, High Court and Environment Court mediation and at numerous joint territorial and regional authority hearings.

Guy has familiarity with and understanding of the current contaminated land regulation and practice in New Zealand including assessments against the NESCS, and in the consenting of contaminated sites.

Figure

SOURCE:
1. AERIAL IMAGERY SOURCED FROM CANTERBURY MAP PARTNERS ADMINISTERED BY ENVIRONMENT CANTERBURY.
2. CADASTRAL INFORMATION SOURCED FROM THE LINZ DATA SERVICE AND LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

FIGURE 1: SITE LOCATION AND CURRENT LAYOUT

SCALE : 1:4,000 (A4)

0 25 50 100 150 200
METRES

PATTLE DELAMORE PARTNERS LTD

C04602100Z004_FIGURE1_SITE4.mxd 07/07/2022 ISSUE 1

Site Photographs

Photograph 1: View looking south-west across the northern paddock from the north-eastern corner of the site.

Photograph 2: View looking south-east at the water tank and pump shed along in the northern part of the site.

Photograph 3: The stormwater structure along the north-eastern site boundary.

Photograph 4: View looking north across the area where imported soils were temporarily store.

Photograph 5: View looking south across the area where imported soils were temporarily stored.

Photograph 6: View looking north-east across the northern paddock of the site.

Photograph 7: The garage in the central part of the northern paddock.

Photograph 8: Metal pipes stored to the immediate north of the garage.

Photograph 9: View looking south-west across the eastern paddock from the north-eastern site boundary.

Photograph 10: View looking north-east across the eastern paddock from the southern site boundary.

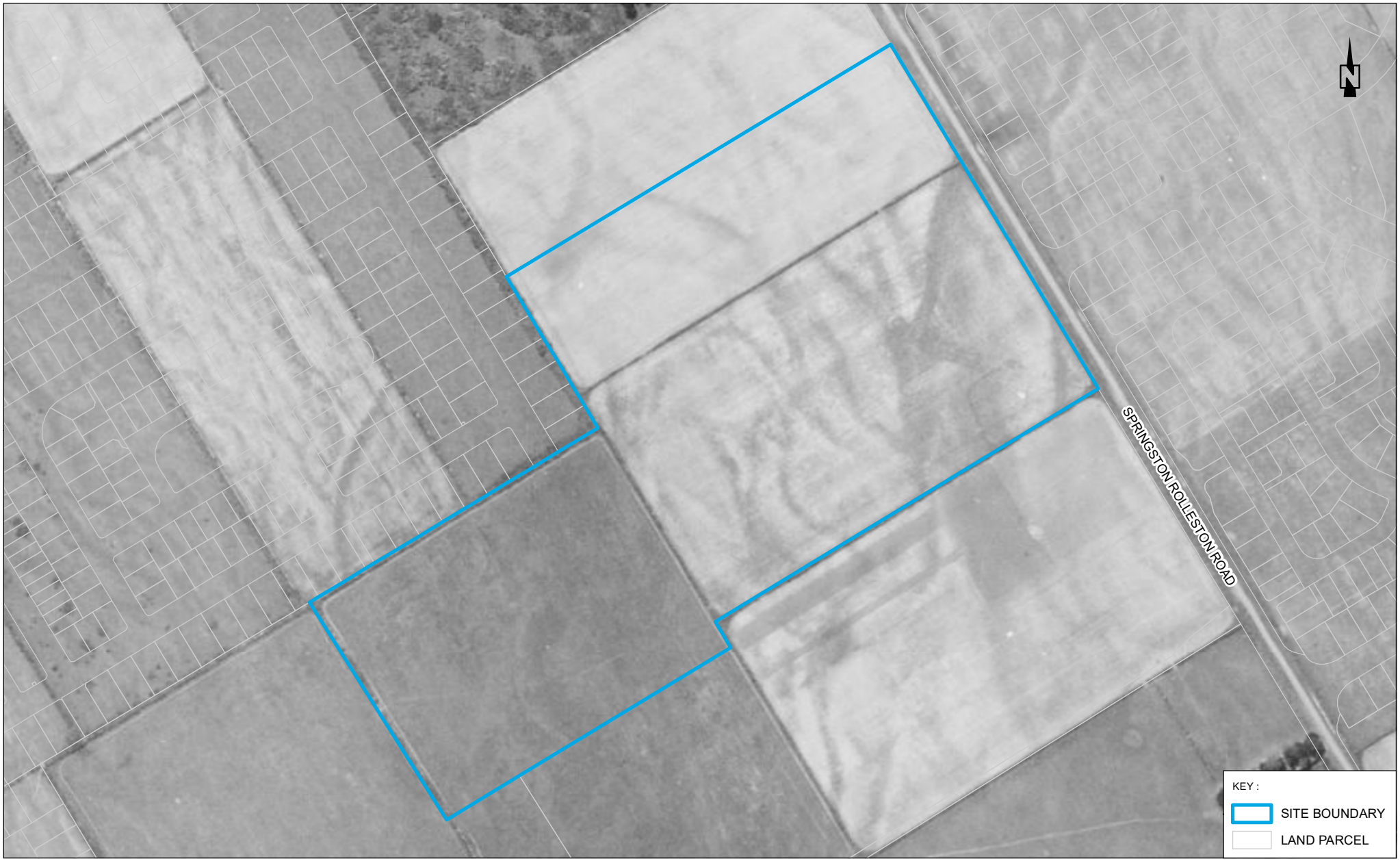
Photograph 11: Looking east at the farm shed on the eastern paddock.

Photograph 12: Looking north-west at the farm shed on the eastern paddock.

Photograph 13: View looking south-west across the western paddock from the north-western corner.

Photograph 14: View looking east across the western paddock from the western corner of the site.

Historical Aerial Photographs



SOURCE:
1. AERIAL IMAGERY SOURCED FROM CANTERBURY MAP PARTNERS ADMINISTERED BY ENVIRONMENT CANTERBURY.
2. CADASTRAL INFORMATION SOURCED FROM THE LINZ DATA SERVICE AND LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

1942 AERIAL PHOTOGRAPH

SCALE : 1:4,000 (A4)

0 25 50 100 150 200

METRES

SOURCE:
1. AERIAL IMAGERY SOURCED FROM CANTERBURY MAP PARTNERS ADMINISTERED BY ENVIRONMENT CANTERBURY.
2. CADASTRAL INFORMATION SOURCED FROM THE LINZ DATA SERVICE AND LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

1961 AERIAL PHOTOGRAPH

SCALE : 1:4,000 (A4)

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METRES

PATTLE DELAMORE PARTNERS LTD

SOURCE:
1. AERIAL IMAGERY SOURCED FROM CANTERBURY MAP PARTNERS ADMINISTERED BY ENVIRONMENT CANTERBURY.
2. CADASTRAL INFORMATION SOURCED FROM THE LINZ DATA SERVICE AND LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

1974 AERIAL PHOTOGRAPH

SCALE : 1:4,000 (A4)

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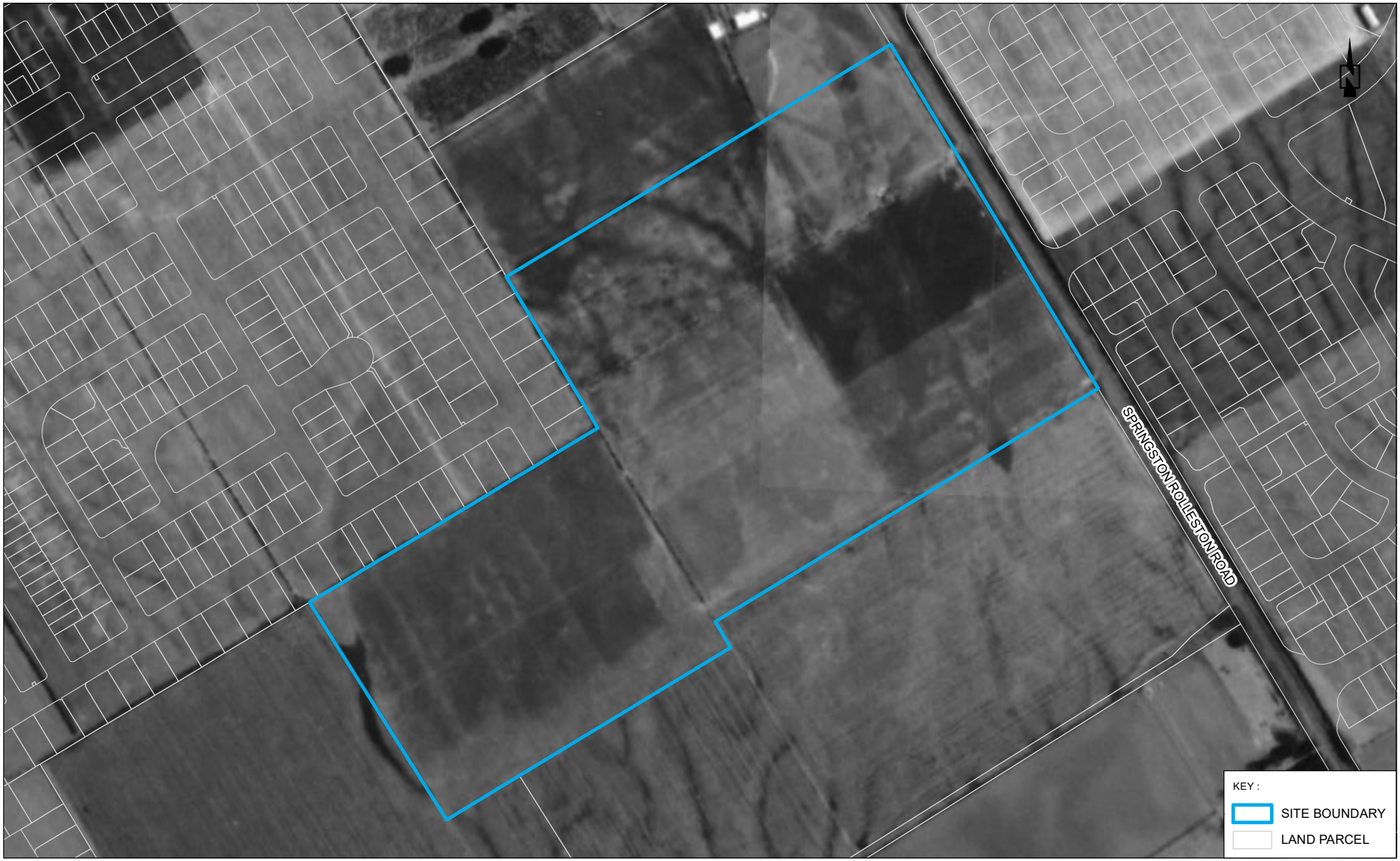
METRES



SOURCE:
1. AERIAL IMAGERY SOURCED FROM CANTERBURY MAP PARTNERS ADMINISTERED BY ENVIRONMENT CANTERBURY.
2. CADASTRAL INFORMATION SOURCED FROM THE LINZ DATA SERVICE AND LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

1982 AERIAL PHOTOGRAPH

SCALE : 1:4,000 (A4)

0 25 50 100 150 200

METRES

PATTLE DELAMORE PARTNERS LTD

SOURCE:
1. AERIAL IMAGERY SOURCED FROM CANTERBURY MAP PARTNERS ADMINISTERED BY ENVIRONMENT CANTERBURY.
2. CADASTRAL INFORMATION SOURCED FROM THE LINZ DATA SERVICE AND LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

1994 AERIAL PHOTOGRAPH

SCALE : 1:4,000 (A4)

0 25 50 100 150 200

METRES

PATTLE DELAMORE PARTNERS LTD

SOURCE:
1. AERIAL IMAGERY SOURCED FROM CANTERBURY MAP PARTNERS ADMINISTERED BY ENVIRONMENT CANTERBURY.
2. CADASTRAL INFORMATION SOURCED FROM THE LINZ DATA SERVICE AND LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

2004 AERIAL PHOTOGRAPH

SCALE : 1:4,000 (A4)

0 25 50 100 150 200

METRES

PATTLE DELAMORE PARTNERS LTD

SOURCE:
1. AERIAL IMAGERY SOURCED FROM CANTERBURY MAP PARTNERS ADMINISTERED BY ENVIRONMENT CANTERBURY.
2. CADASTRAL INFORMATION SOURCED FROM THE LINZ DATA SERVICE AND LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

2012 AERIAL PHOTOGRAPH

SCALE : 1:4,000 (A4)

0 25 50 100 150 200

METRES

PATTLE DELAMORE PARTNERS LTD

SOURCE:
1. AERIAL IMAGERY SOURCED FROM CANTERBURY MAP PARTNERS ADMINISTERED BY ENVIRONMENT CANTERBURY.
2. CADASTRAL INFORMATION SOURCED FROM THE LINZ DATA SERVICE AND LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

2021 AERIAL PHOTOGRAPH

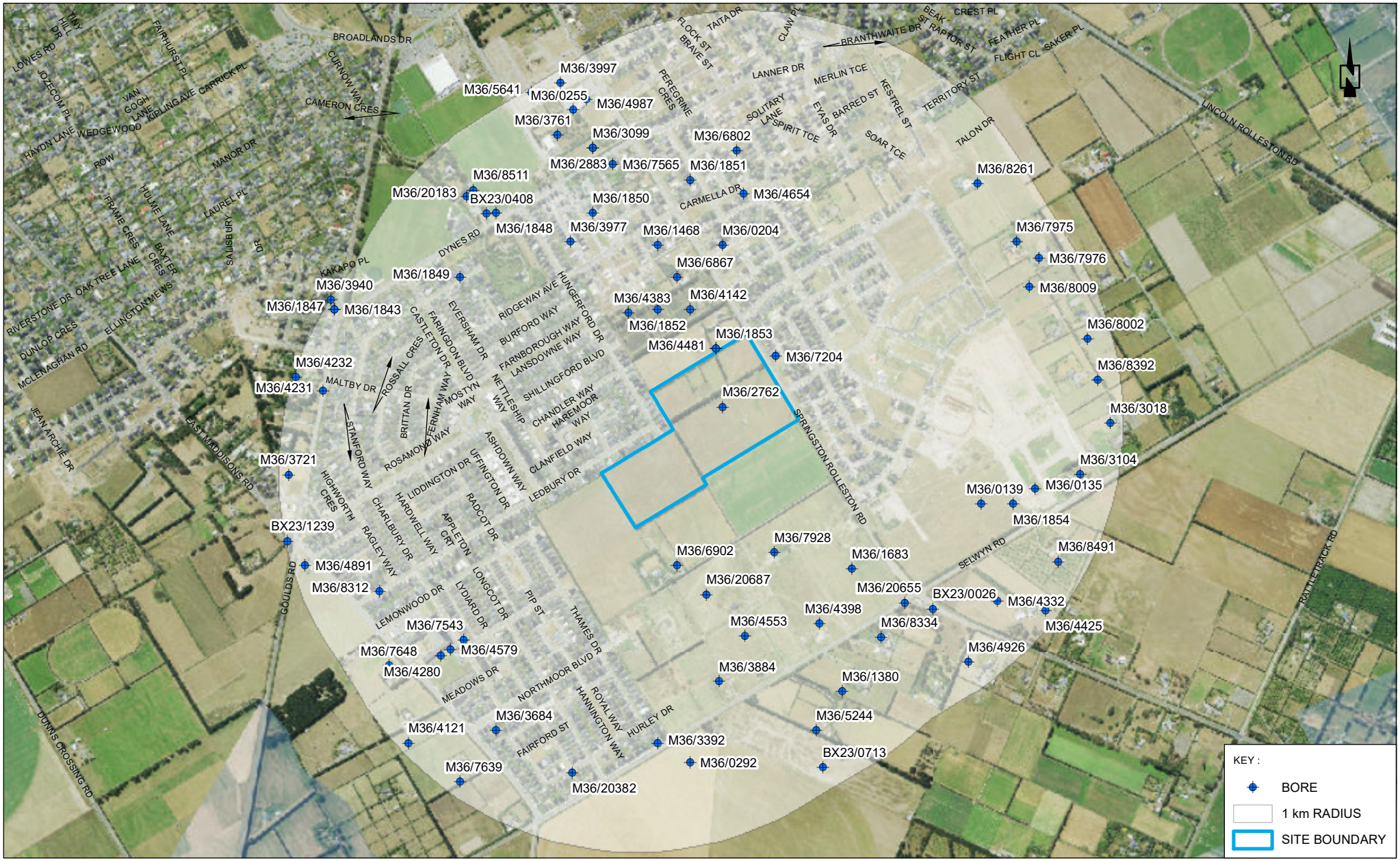
SCALE : 1:4,000 (A4)

0 25 50 100 150 200

METRES

PATTLE DELAMORE PARTNERS LTD

Environment Canterbury Records



SOURCE:
1. AERIAL IMAGERY SOURCED FROM CANTERBURY MAP PARTNERS ADMINISTERED BY ENVIRONMENT CANTERBURY.
2. CADASTRAL INFORMATION SOURCED FROM THE LINZ DATA SERVICE AND LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

GROUNDWATER BORES WITHIN A 1 KM RADIUS OF THE SITE BOUNDARY - SOURCED FROM THE ECAN GIS DATABASE APRIL 2022

SCALE : 1:16,000 (A4)

0 50 100 200 300 400 500 600

METRES

Bores located within a 1 km radius of the Site Boundary. (Sourced from ECan GIS Database in April 2022)

	Well No.	Well Status	Depth (m)	Diameter (mm)	Use Codes	Screened Depth/s	Grid East	Grid North	Well Owner	Well Type	Well Location	Top Screen	Bottom Screen	Initial SWL	Aprrox. Distance from centre of Site (m)
1	M36/2762	Not Used	24.3	200	Irrigation		1551407	5170490	THOM, C.N. & S.M.	Bore or Well	SPRINGSTON-ROLLESTON ROAD			-5.80	50
2	M36/1853	Active (exist, present)	14	150	Irrigation	11 to 14	1551387	5170670	KIDD P.R.	Bore or Well	SPRINGSTON ROLLESTON ROAD	11	14		190
3	M36/4481	Filled in	30	150	Domestic and Stockwater	28 to 30	1551387	5170670	THOM C.N & S.M	Bore or Well	SPRINGSTON ROLLESTON RD	28	30	-5.5	190
4	M36/7204	Buried / unlikely still exists	114	200	Irrigation	88 to 94	1551572	5170646	Mr & Mrs R Geddes & Davis	Bore or Well	SPRINGSTON ROLLESTON ROAD	88	94	-7.3	270
5	M36/4142	Active (exist, present)	27.4	100	Domestic Supply		1551307	5170790	DONALDSON J.D.	Bore or Well	SPRINGSTON ROLLESTON RD				310
6	M36/1852	Filled in	24.3	150	Irrigation	21.3 to 24.3	1551207	5170790	MAWHINNEY, D.	Bore or Well	SPRINGSTON & ROLLESTON ROAD	21.3	24.3		340
7	M36/4383	Active (exist, present)	24	150	Domestic Supply	23 to 24	1551117	5170780	WARMAN D.G.	Bore or Well	SPRINGSTON ROLLESTON RD	23	24		380
8	M36/6867	Active (exist, present)	30	150	Domestic Supply	28.5 to 30	1551267	5170890	BN McIntyre	Bore or Well	Springston Rolleston Road	28.5	30	-6.3	410
9	M36/6902	Active (exist, present)	42	150	Irrigation	25.5 to 27	1551267	5170000	Mr A J Cartwright	Bore or Well	Springston Rolleston Road	25.5	27	-6.4	500
10	M36/0204	Not Used	27.4	102	Domestic Supply	24.2 to 27.4	1551407	5170990	MOW	Bore or Well	SPRINGSTON ROLLESTON RD	24.2	27.4	-7.3	500
11	M36/7928	Active (exist, present)	37	150	Domestic and Stockwater	35 to 37	1551567	5170040	RP & EM YATES	Bore or Well	SELWYN ROAD	35	37	-7.6	500
12	M36/1468	Active (exist, present)	30	150	Irrigation		1551207	5170990	GILES B.J.	Bore or Well	SPRINGSTON-ROLLESTON ROAD			-9.6	520
13	M36/20687	Active (exist, present)	36	150	Domestic and Stockwater	35 to 36	1551357	5169910	MR G M SOLE	Bore or Well	SELWYN ROAD	35	36		580
14	M36/3977	Active (exist, present)	34	150	Domestic Supply		1550937	5171000	HOWDEN K.D.	Bore or Well	DYNES RD				660
15	M36/1683	Active (exist, present)	13.1	150	Domestic and Stockwater	10.1 to 13.1	1551807	5169990	YATES R.P.	Bore or Well	SPRINGSTON ROLLESTON ROAD	10.1	13.1		670
16	M36/4654	Active (exist, present)	45.85	200	Irrigation	43.9 to 45.9	1551472	5171148	Mr G C Main & Mrs V L Eilken-Main	Bore or Well	SPRINGSTON-ROLLESTON ROAD	43.9	45.9		670
17	M36/1850	Active (exist, present)	18	150	Domestic and Stockwater		1551007	5171090	WHITTINGTON, B.R.	Bore or Well	DYNES ROAD			-9.67	690
18	M36/1851	Not Used	16	76			1551307	5171190	DUNCAN	Bore or Well	CNR DYNES ROAD & SPRINGSTON ROLLESTO			-9.93	700
19	M36/4553	Not Used	33	150	Irrigation	31 to 33	1551477	5169781	MILLS .J	Bore or Well	SELWYN RD	31	33	-5.791	720
20	M36/4398	Active (exist, present)	24.4	150	Irrigation	22 to 24	1551707	5169821	YATES RP & EM	Bore or Well	SELWYN RD	22	24	-8.00	760
21	M36/7565	Active (exist, present)	35	150	Domestic Supply	33 to 35	1551067	5171240	Mr & Mrs T & N Buhrs	Bore or Well	551 Dynes Road	33	35	-12.5	800
22	M36/6802	Active (exist, present)	36.4	150	Irrigation	34 to 36.4	1551451	5171282	Mr & Mrs J R & A J Forrest	Bore or Well	SPRINGSTON-ROLLESTON ROAD	34	36.4	-8.1	800
23	M36/3884	Sealed / Grouted up	24	127	Domestic Supply	23.1 to 24	1551397	5169641	PALMER AG & ER	Bore or Well	SELWYN RD	23.1	24	-5.84	850
24	M36/1849	Not Used	48	200	Irrigation	44 to 48	1550597	5170890	FOSTER,D.M.	Bore or Well	DYNES ROAD	44	48	-11.5	860
25	M36/20655	Active (exist, present)	14.5	150	Water Level Observation	7.5 to 15	1551971	5169884	SELWYN DISTRICT COUNCIL	Bore or Well	SPRINGSTON ROLLESTON ROAD	7.5	15		860
26	M36/2883	Active (exist, present)	21	150	Domestic Supply		1551007	5171290	SHEARER	Bore or Well	DYNES RD				870
27	M36/3099	Active (exist, present)	36	150	Domestic Supply	34.5 to 36	1551007	5171290	DEPT.LANDS & SURVEY	Bore or Well	DYNES RD	34.5	36	-10.5	870
28	M36/1848	Not Used	24	200	Irrigation		1550707	5171090	FOSTER D.M.	Bore or Well	DYNES ROAD.				880
29	M36/8334	Active (exist, present)	48	150	Domestic and Stockwater	46.5 to 48	1551898	5169777	MR & MRS VAN DER ZWET	Bore or Well	SELWYN ROAD	46.5	48	-8.2	900
30	M36/0139	Sealed / Grouted up	65.8	203	Domestic and Stockwater	55.1 to 65.8	1552207	5170190	GREENSLADE J.C.	Bore or Well	SELWYN RD	55.1	65.8	-5.3	900
31	BX23/0408	Active (exist, present)	102	200	Irrigation	99 to 102	1550678	5171087	Selwyn District Council	Bore or Well	Dynes Road	99	102	-11.1	900
32	BX23/0026	Active (exist, present)	38.8	150	Other - see comments	37.3 to 38.8	1552058	5169865	SELWYN DISTRICT COUNCIL	Bore or Well	CN SELWYN & SPRINGSTON ROLLESTON RDS	37.3	38.8	-7.2	940
33	M36/3761	Active (exist, present)	33.25	125	Domestic Supply		1550897	5171330	BARNES M.R.	Bore or Well	DYNES RD			-8.6	960
34	M36/1380	Active (exist, present)	56.1	200	Irrigation		1551777	5169611	P J & H M Rains Family Trust	Bore or Well	CNR SELWYN & SPRINGSTON ROLLESTON RD			-5.94	970
35	M36/8511	No Info Expired Boreconsent	43	150	Domestic and Stockwater		1550637	5171160	MR D J FOSTER	Bore or Well	DYNES ROAD				980
36	M36/20183	No Info Expired Boreconsent	50	200	Irrigation		1550617	5171140	MR & MRS D J & A P FOSTER	Bore or Well	DYNES ROAD				980
37	M36/1854	Not Used	10.2	76			1552306	5170190	GREENSLADE J.C.	Bore or Well	SELWYN RD			-7.88	1000
38	M36/0255	Sealed / Grouted up	24.4	100	Water Level Observation		1550946	5171407	Christian Schools Trust	Bore or Well	SPRINGSTON ROLLESTON ROAD			-8.09	1010
39	M36/4987	Active (exist, present)	28	150	Domestic Supply	26 to 28	1550987	5171440	MITCHELL, A.J. & L.A.	Bore or Well	SPRINGSTON ROLLESTON ROAD	26	28	-11.20	1020
40	M36/7543	Active (exist, present)	26	150	Domestic and Stockwater	24 to 26	1550607	5169770	Mr & Ms G K & P R Poole & Eastmond	Bore or Well	East Maddison Road	24.0	26.0	-7.7	1040
41	M36/3392	Active (exist, present)	34	150	Domestic Supply	31 to 34	1551207	5169451	STERNE SJ & VL	Bore or Well	SELWYN RD	31	34	-2.96	1050
42	M36/0135	Sealed / Grouted up	14	203	Irrigation	8.5 to 11.6	1552373	5170238	Mr D L Geddes	Bore or Well	SELWYN RD	8.5	11.6	-7.3	1050
43	M36/5244	Active (exist, present)	38	150	Domestic and Stockwater	36.5 to 38	1551697	5169491	MORRIS, A.R & M.A	Bore or Well	SELWYN ROAD	36.5	38	-10.8	1050
44	M36/4332	Active (exist, present)	30	150	Irrigation		1552257	5169891	MOULDER D.W	Bore or Well	SELWYN RD				1080
45	M36/8261	No Info Expired Boreconsent	40	150	Domestic Supply		1552196	5171180	MR & MS SR & AJ BOYCE & SMITH	Bore or Well	SELWYN ROAD				1090
46	M36/7975	Active (exist, present)	37.5	150	Domestic Supply	35 to 37.5	1552316	5171000	MR & MS SH & EL LOEFFLER & HUISMANS	Bore or Well	SELWYN ROAD	35	37.5	-10	1090
47	M36/4579	Not Used	23.5	150			1550567	5169740	MEADOWS, G.L.	Bore or Well	MADDISONS RD			-7.0	1090
48	M36/3997	Sealed / Grouted up	42	125	Domestic Supply	39 to 42	1550907	5171490	COMMON A.D. H	Bore or Well	SPRINGSTON ROLLESTON RD	39	42	-13.00	1100
49	M36/0292	Active (exist, present)	12.8	100	Domestic Supply		1551307	5169391		Bore or Well	SELWYN ROAD				1100
50	M36/5641	Sealed / Grouted up	36	125	Domestic Supply	34 to 36	1550817	5171460	BUNKER, RJA	Bore or Well	SPRINGSTON ROLLESTON ROAD	34	36	-9.0	1110
51	M36/4280	Active (exist, present)	25	150	Irrigation		1550537	5169720	MEADOWS, G.L & J.M	Bore or Well	MADDISONS RD				1120
52	M36/4926	Active (exist, present)	30	150	Irrigation		1552167	5169701	Messrs R S, A G & J H Paton & Mrs J R Geddes	Bore or Well	SPRINGSTON ROLLESTON ROAD				1130
53	M36/7976	Active (exist, present)	36	150	Domestic and Stockwater	34 to 36	1552386	5170950	WEATHERBY ESTATE LIMITED	Bore or Well	SELWYN ROAD	34	36	-10.6	1130
56	M36/8312	No Info Expired Boreconsent	38	150	Domestic and Stockwater		1550347	5169920	MR K D FINDLATER	Bore or Well	EAST MADDISON ROAD				1160
57	BX23/0713	Active (exist, present)	36	150	Domestic and Stockwater	34 to 36	1551718	5169376	Robert Harneiss	Bore or Well	725 Selwyn Rd	34	36		1170
58	M36/4231	Active (exist, present)	35	150	Domestic Supply		1550173	5170539	WHITE C.E.	Bore or Well	GOULDS RD				1180
59	M36/3104	Active (exist, present)	20	150	Domestic Supply		1552512	5170281	VICKERS .M	Bore or Well	SELWYN RD				1180
60	M36/3684	Active (exist, present)	19	150	Irrigation	12.2 to 13.4	1550707	5169491	MEADOWS G.L.	Bore or Well	MADDISONS RD	12.2	13.4		1190
61	M36/8491	Active (exist, present)	44.8	150	Irrigation	41 to 45	1552445	5170012	Mr & Mrs Andrew & Megan Murphy	Bore or Well	623 SELWYN ROAD	41	45	9.3	1190
62	M36/1847	Active (exist, present)	19	150	Domestic Supply		1550207	5170790	MAYER IF & JK	Bore or Well	GOULDS RD			-8.85	1190
63	M36/20382	Active (exist, present)	36	150	Domestic and Stockwater	34.5 to 36	1550943	5169360	I J & B A BURRELL	Bore or Well	CRN EAST MADDISONS & SELWYN ROADS	34.5	36	-7.2	1200
64	M36/3940	Active (exist, present)	32.4	150	Stock Supply		1550197	5170820	WATSON .G.	Bore or Well	GOULDS RD			-9.2	1200
65	M36/8002	Active (exist, present)	66	150	Domestic and Stockwater	64.5 to 66	1552536	5170700	MR & MRS AT & JM MULCAY	Bore or Well	SELWYN ROAD	64.5	66	-12.40	1200
66	M36/8392	Active (exist, present)	36	150	Domestic Supply	34 to 36	1552567	5170574	A J LLOYD	Bore or Well	572 SELWYN ROAD	34	36	-10.0	1220
67	M36/4425	Active (exist, present)	36	150	Irrigation		1552406	5169861	Ms V A Bingham-Grandiek	Bore or Well	Selwyn RD				1230
68	M36/3018	Active (exist, present)	65.7	200	Irrigation	58 to 61	1552606	5170440	BOWDEN M.L.	Bore or Well	SELWYN RD	58	61	-9.32	1250
69	M36/7648	Active (exist, present)	26	150	Domestic and Stockwater	24 to 26	1550377	5169690	Mr & Ms PM & KI Tilling & Thompson	Bore or Well	East Maddisons Road	24	26	-8.1	1260
70	M36/4232	Not Used		51			1550089	5170582	WHITE C.E.	Bore or Well	GOULDS RD				1270
71	M36/3721	Active (exist, present)	19	150	Domestic Supply		1550067	5170280	WILSON N.L.	Bore or Well	GOULDS RD			-7	1300
72	M36/4891	Active (exist, present)	25.25	150	Domestic and Stockwater	23.25 to 25.25	1550117	5170000	Mr & Ms B N & J A Stevens & Gray	Bore or Well	CNR MADDISONS & GOULDS ROAD	23.25	25.25	-7.38	1330
73	BX23/1239	Buried / unlikely still exists	31	100			1550063	5170075		Bore or Well	Corner Maddisons and Goulds Road				1350
74	M36/7639	Active (exist, present)	32	150	Domestic and Stockwater	29 to 31	1550597	5169331	Mr & Mrs DA & MG Miller	Bore or Well	0503 East Maddisons Road	29	31	-6.3	1380
75	M36/4121	Active (exist, present)	21.5	152	Domestic and Stockwater		1550437	5169451	WARREN RJ & CL	Bore or Well	MADDISONS RD			-6.0	1380

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Customer Services
P. 03 353 9007 or 0800 324 636

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

Dear Sir/Madam

Thank you for submitting your property enquiry from our Listed Land Use Register (LLUR). The LLUR holds information about sites that have been used or are currently used for activities which have the potential to cause contamination.

The LLUR statement shows the land parcel(s) you enquired about and provides information regarding any potential LLUR sites within a specified radius.

Please note that if a property is not currently registered on the LLUR, it does not mean that an activity with the potential to cause contamination has never occurred, or is not currently occurring there. The LLUR database is not complete, and new sites are regularly being added as we receive information and conduct our own investigations into current and historic land uses.

The LLUR only contains information held by Environment Canterbury in relation to contaminated or potentially contaminated land; additional relevant information may be held in other files (for example consent and enforcement files).

Please contact Environment Canterbury if you wish to discuss the contents of this property statement.

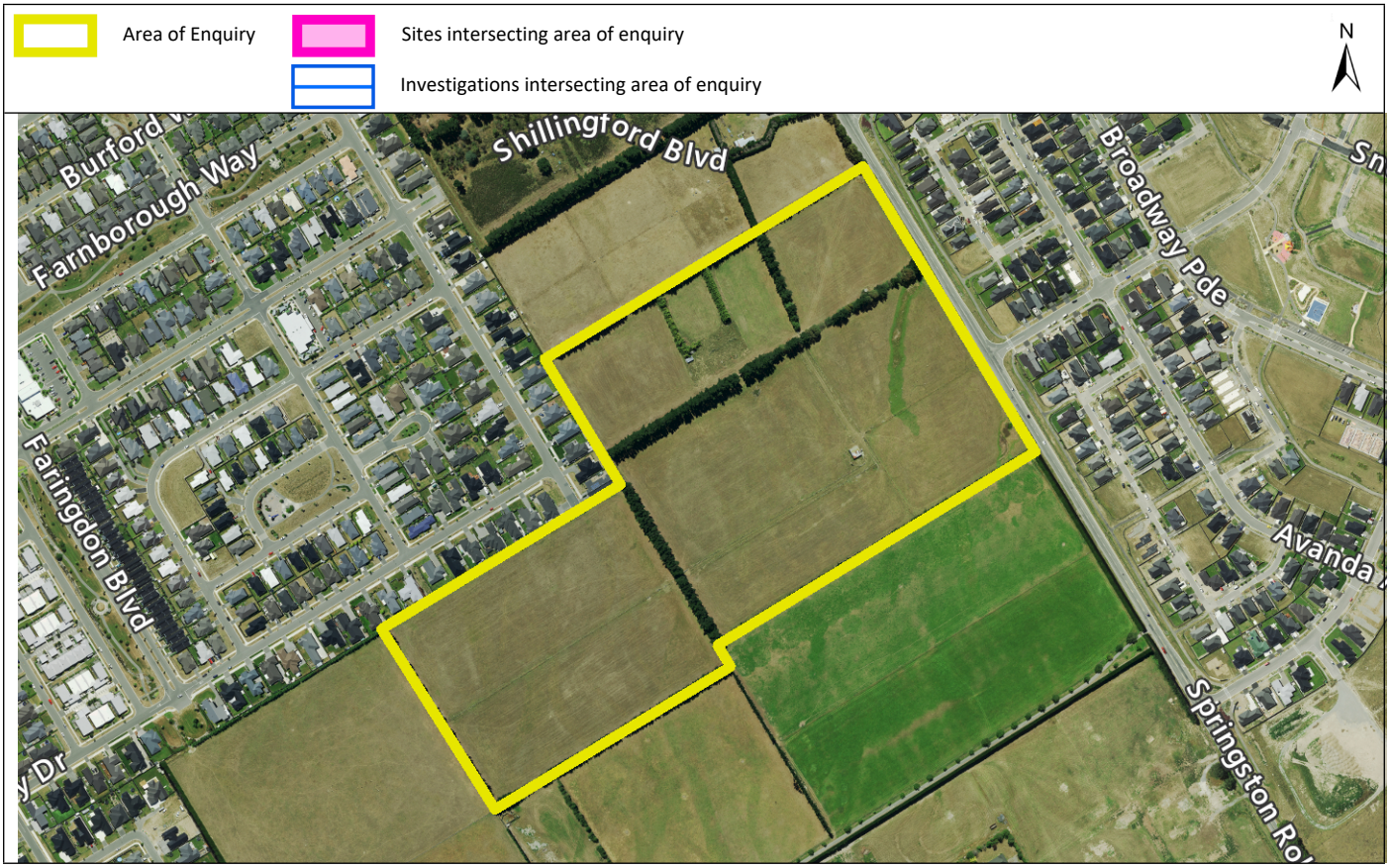
Yours sincerely

Contaminated Sites Team

Property Statement
from the Listed Land Use Register

Visit ecan.govt.nz/HAIL for more information or
contact Customer Services at ecan.govt.nz/contact/ and quote ENQ312358

Date generated: 26 April 2022
Land parcels: Lot 2 DP 61162



The information presented in this map is specific to the property you have selected. Information on nearby properties may not be shown on this map, even if the property is visible.

Sites at a glance

Sites within enquiry area

There are no sites associated with the area of enquiry.

More detail about the sites

There are no sites associated with the area of enquiry.

Disclaimer

The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987.

The information contained in this report reflects the current records held by Environment Canterbury regarding the activities undertaken on the site, its possible contamination and based on that information, the categorisation of the site. Environment Canterbury has not verified the

accuracy or completeness of this information. It is released only as a copy of Environment Canterbury's records and is not intended to provide a full, complete or totally accurate assessment of the site. It is provided on the basis that Environment Canterbury makes no warranty or representation regarding the reliability, accuracy or completeness of the information provided or the level of contamination (if any) at the relevant site or that the site is suitable or otherwise for any particular purpose. Environment Canterbury accepts no responsibility for any loss, cost, damage or expense any person may incur as a result of the use, reference to or reliance on the information contained in this report.

Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Listed Land Use Register

What you need to know

Everything is connected

What is the Listed Land Use Register (LLUR)?

The LLUR is a database that Environment Canterbury uses to manage information about land that is, or has been, associated with the use, storage or disposal of hazardous substances.

Why do we need the LLUR?

Some activities and industries are hazardous and can potentially contaminate land or water. We need the LLUR to help us manage information about land which could pose a risk to your health and the environment because of its current or former land use.

Section 30 of the Resource Management Act (RMA, 1991) requires Environment Canterbury to investigate, identify and monitor contaminated land. To do this we follow national guidelines and use the LLUR to help us manage the information.

The information we collect also helps your local district or city council to fulfil its functions under the RMA. One of these is implementing the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil, which came into effect on 1 January 2012.

For information on the NES, contact your city or district council.

How does Environment Canterbury identify sites to be included on the LLUR?

We identify sites to be included on the LLUR based on a list of land uses produced by the Ministry for the Environment (MfE). This is called the Hazardous Activities and Industries List (HAIL)[1]. The HAIL has 53 different activities, and includes land uses such as fuel storage sites, orchards, timber treatment yards, landfills, sheep dips and any other activities where hazardous substances could cause land and water contamination.

We have two main ways of identifying HAIL sites:

- We are actively identifying sites in each district using historic records and aerial photographs. This project started in 2008 and is ongoing.
- We also receive information from other sources, such as environmental site investigation reports submitted to us as a requirement of the Regional Plan, and in resource consent applications.

[1] The Hazardous Activities and Industries List (HAIL) can be downloaded from MfE's website www.mfe.govt.nz, keyword search HAIL

How does Environment Canterbury classify sites on the LLUR?

Where we have identified a HAIL land use, we review all the available information, which may include investigation reports if we have them. We then assign the site a category on the LLUR. The category is intended to best describe what we know about the land use and potential contamination at the site and is signed off by a senior staff member.

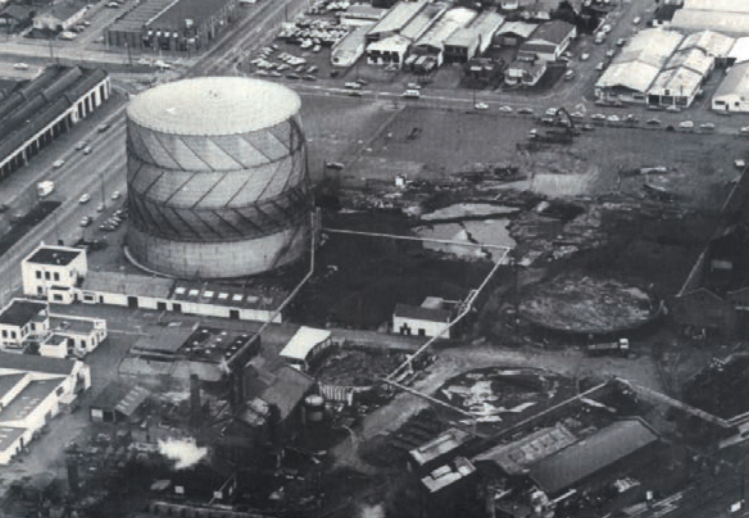
Please refer to the Site Categories and Definitions factsheet for further information.

What does Environment Canterbury do with the information on the LLUR?

The LLUR is available online at www.llur.ecan.govt.nz. We mainly receive enquiries from potential property buyers and environmental consultants or engineers working on sites. An inquirer would typically receive a summary of any information we hold, including the category assigned to the site and a list of any investigation reports.

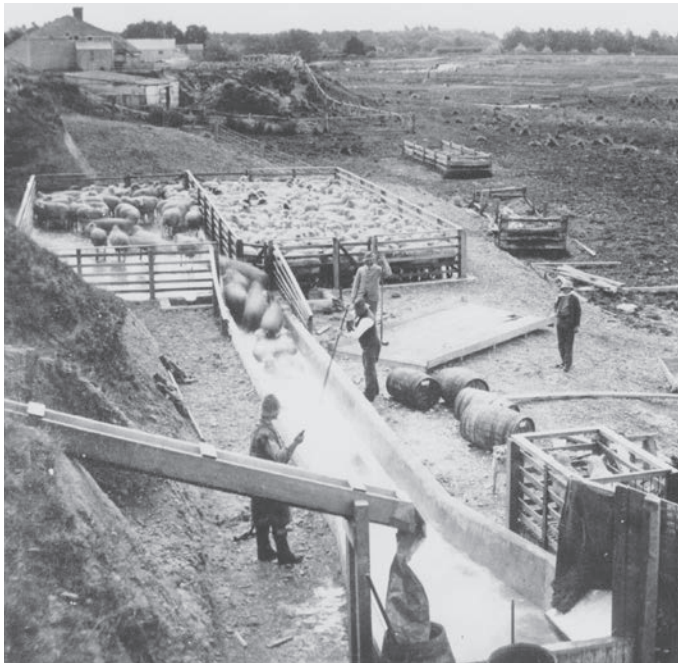
We may also use the information to prioritise sites for further investigation, remediation and management, to aid with planning, and to help assess resource consent applications. These are some of our other responsibilities under the RMA.

If you are conducting an environmental investigation or removing an underground storage tank at your property, you will need to comply with the rules in the Regional Plan and send us a copy of the report. This means we can keep our records accurate and up-to-date, and we can assign your property an appropriate category on the LLUR. To find out more, visit www.ecan.govt.nz/HAIL.



IMPORTANT!

The LLUR is an online database which we are continually updating. A property may not currently be registered on the LLUR, but this does not necessarily mean that it hasn't had a HAIL use in the past.



Sheep dipping (ABOVE) and gas works (TOP) are among the former land uses that have been identified as potentially hazardous. (Photo above by Wheeler & Son in 1987, courtesy of Canterbury Museum.)

My land is on the LLUR – what should I do now?

IMPORTANT! Just because your property has a land use that is deemed hazardous or is on the LLUR, it doesn't necessarily mean it's contaminated. The only way to know if land is contaminated is by carrying out a detailed site investigation, which involves collecting and testing soil samples.

You do not need to do anything if your land is on the LLUR and you have no plans to alter it in any way. It is important that you let a tenant or buyer know your land is on the Listed Land Use Register if you intend to rent or sell your property. If you are not sure what you need to tell the other party, you should seek legal advice.

You may choose to have your property further investigated for your own peace of mind, or because you want to do one of the activities covered by the National Environmental Standard for Assessing and Managing Contaminants in Soil. Your district or city council will provide further information.

If you wish to engage a suitably qualified experienced practitioner to undertake a detailed site investigation, there are criteria for choosing a practitioner on www.ecan.govt.nz/HAIL.

I think my site category is incorrect – how can I change it?

If you have an environmental investigation undertaken at your site, you must send us the report and we will review the LLUR category based on the information you provide. Similarly, if you have information that clearly shows your site has not been associated with HAIL activities (eg. a preliminary site investigation), or if other HAIL activities have occurred which we have not listed, we need to know about it so that our records are accurate.

If we have incorrectly identified that a HAIL activity has occurred at a site, it will be not be removed from the LLUR but categorised as Verified Non-HAIL. This helps us to ensure that the same site is not re-identified in the future.

Contact us

Property owners have the right to look at all the information Environment Canterbury holds about their properties.

It is free to check the information on the LLUR, online at www.llur.ecan.govt.nz.

If you don't have access to the internet, you can enquire about a specific site by phoning us on (03) 353 9007 or toll free on 0800 EC INFO (32 4636) during business hours.

Contact Environment Canterbury:

Email: ecinfo@ecan.govt.nz

Phone:
Calling from Christchurch: (03) 353 9007
Calling from any other area: 0800 EC INFO (32 4636)

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Everything is connected

Promoting quality of life through balanced resource management.

www.ecan.govt.nz E13/101

Listed Land Use Register

Site categories and definitions

When Environment Canterbury identifies a Hazardous Activities and Industries List (HAIL) land use, we review the available information and assign the site a category on the Listed Land Use Register. The category is intended to best describe what we know about the land use.

If a site is categorised as **Unverified** it means it has been reported or identified as one that appears on the HAIL, but the land use has not been confirmed with the property owner.

If the land use has been confirmed but analytical information from the collection of samples is not available, and the presence or absence of contamination has therefore not been determined, the site is registered as:

Not investigated:

- A site whose past or present use has been reported and verified as one that appears on the HAIL.
- The site has not been investigated, which might typically include sampling and analysis of site soil, water and/or ambient air, and assessment of the associated analytical data.
- There is insufficient information to characterise any risks to human health or the environment from those activities undertaken on the site. Contamination may have occurred, but should not be assumed to have occurred.

If analytical information from the collection of samples is available, the site can be registered in one of six ways:

At or below background concentrations:

The site has been investigated or remediated. The investigation or post remediation validation results confirm there are no hazardous substances above local background concentrations other than those that occur naturally in the area. The investigation or validation sampling has been sufficiently detailed to characterise the site.

Below guideline values for:

The site has been investigated. Results show that there are hazardous substances present at the site but indicate that any adverse effects or risks to people and/or the environment are considered to be so low as to be acceptable. The site may have been remediated to reduce contamination to this level, and samples taken after remediation confirm this.

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Managed for:

The site has been investigated. Results show that there are hazardous substances present at the site in concentrations that have the potential to cause adverse effects or risks to people and/or the environment. However, those risks are considered managed because:

- the nature of the use of the site prevents human and/or ecological exposure to the risks; and/or
- the land has been altered in some way and/or restrictions have been placed on the way it is used which prevent human and/or ecological exposure to the risks.

Partially investigated:

The site has been partially investigated. Results:

- demonstrate there are hazardous substances present at the site; however, there is insufficient information to quantify any adverse effects or risks to people or the environment; or
- do not adequately verify the presence or absence of contamination associated with all HAIL activities that are and/or have been undertaken on the site.

Significant adverse environmental effects:

The site has been investigated. Results show that sediment, groundwater or surface water contains hazardous substances that:

- have significant adverse effects on the environment; or
- are reasonably likely to have significant adverse effects on the environment.

Contaminated:

The site has been investigated. Results show that the land has a hazardous substance in or on it that:

- has significant adverse effects on human health and/or the environment; and/or
- is reasonably likely to have significant adverse effects on human health and/or the environment.

If a site has been included incorrectly on the Listed Land Use Register as having a HAIL, it will not be removed but will be registered as:

Verified non-HAIL:

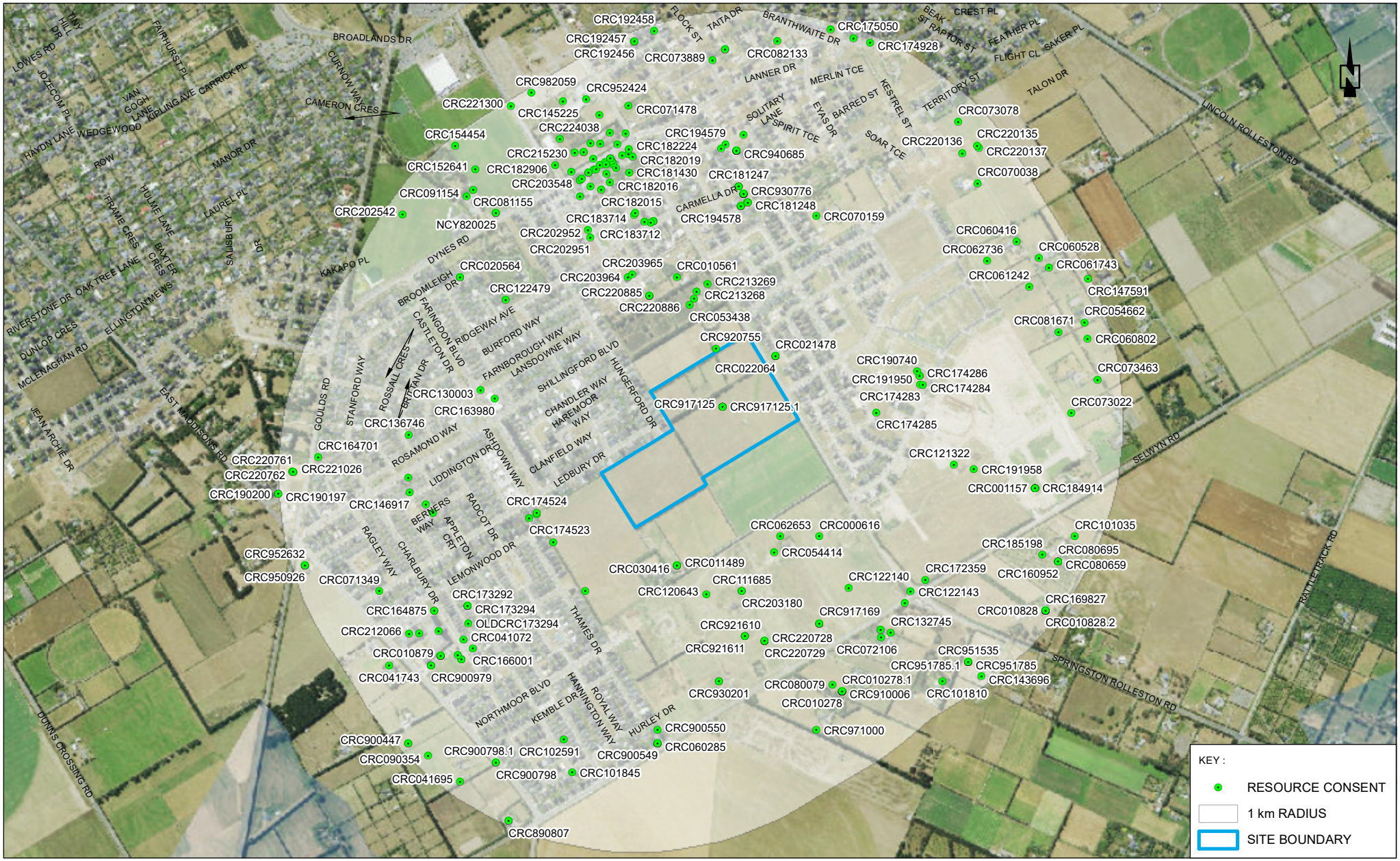
Information shows that this site has never been associated with any of the specific activities or industries on the HAIL.

Please contact Environment Canterbury for further information:

(03) 353 9007 or toll free
on 0800 EC INFO (32 4636)
email ecinfo@ecan.govt.nz

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

E13/102



SOURCE:
1. AERIAL IMAGERY SOURCED FROM CANTERBURY MAP PARTNERS ADMINISTERED BY ENVIRONMENT CANTERBURY.
2. CADASTRAL INFORMATION SOURCED FROM THE LINZ DATA SERVICE AND LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

RESOURCE CONSENTS WITHIN A 1 KM RADIUS OF THE SITE BOUNDARY - SOURCED FROM THE ECAN GIS DATABASE APRIL 2022

SCALE : 1:16,000 (A4)

0 50 100 200 300 400 500 600

METRES

Selwyn District Council Property Records

RS 41727
SO 16041

1
4·0305ha.

2
15·9235ha.

3
D.P. 30535

R.S. 15710

B. M. 68

R.S. 12514

SPRINGSTON - ROLLESTON ROAD (2012)

697 000mN

696 700mN

273 200mE

273 500mE

Approvals

Registered Owners

Approved pursuant to Section 223 of th Resource Management Act 1991 on the 5 day of February 1992.

The common seal of the Selwyn Distr Council is affixed hereto in the presence

Mayor

District Sec

THE SELWYN DISTRIC THIS Common Seal OF

Completion/~~Compliance~~/Condition Certificate No. A984552/1

Separate Approvals/Consents No.

New Titles Issued
Lot 1 CT 38C/604
Lot 2 CT 38C/605

DISTRICT LAND REGISTRAR CANTERBURY N.Z.

Total Area 19·9540

Comprised in C.T. 12F/513

I, Warren John McColl of Christc

Registered Surveyor and holder of an annual practising certificate may act as a registered surveyor pursuant to section 25 of the Su 1986) hereby certify that this plan has been made from surveys c by me or under my directions, that both plan and survey are cor have been made in accordance with the Survey Regulations 197 regulations made in substitution thereof.

Dated at Christchurch this 14th day of May 1992 Signature

Field Book p. Traverse Book p.

Reference Plans D.Ps 30535, 8530, 14298, 60199 S.Os 5877, 13712, 14728, 16041, BN

Examined Correct

Approved as to Survey

4/6/92 Deputy Chief Su

Deposited this 23rd day of February

Land ~~District~~ Land R.

File

Received 15·5·92

Instructions

DP 611

T

LAND DISTRICT Canterbury
SURVEY BLK. & DIST. III Leeston
NZMS 261 SHT M36 RECORD MAP 10,000 / 3·2 ✓

LOTS 1 & 2 BEING SUBDIVISION OF LOT 1 D.P. 30535

TERRITORIAL AUTHORITY Selwyn District
Surveyed by Davie, Lovell-Smith & Partners SO922
Scale 1:2,500 Date April 1992

W A ROBERTSON SURVEYOR GENERAL, DEPARTMENT OF SURVEY AND LAND INFORMATION, NEW ZEALAND

Selwyn
DISTRICT
COUNCIL

CENTRES: P.O. BOX 16342, HORNBY
PH: (03) 495-745 FAX (03) 495-746

LEESTON
P.O. BOX 2, LEESTON
PH: (03) 243-859 FAX (03) 243-531

DARFIELD
P.O. BOX 1, DARFIELD
PH: (0516) 88-416 FAX (0516) 88-542

BUILDING PERMIT APPLICATION

To: The Engineer,

I/We hereby apply for a building permit for the work described below and in accordance with the PLANS AND SPECIFICATIONS HEREWITH IN TRIPLICATE

Description of Work: Hay / Implement Shed.

Proposed use: Storage of farm machinery / Hay.

The following details are attached (please confirm checklist and tick appropriate box).

[✓] Site Plan [✓] Elevations [✓] Floor Plan [✓] Cross Section [✓] Specifications

PERMIT POSTED TO Owner [✓] Builder [ ] Applicant [ ]

Owner
Name: C.N & S.M. THOM (ex Wade)
Mailing Address: Springston Rolleston Rd, RD 5. Ch. ch.
Phone No. 3478-300

Builder
Name: C.N. THOM
Mailing Address: (as owner)
Phone No. 3478-300

Property on which work will be done
Street/Road: as above address
Town/District: Ch. Ch.

Designer/Principal Consultant
Name
Address
Phone No.

PROPERTY SIZE 19.9545 hectares

DWELLING UNITS PROPOSED
Ground Floor Existing ....m²
Proposed 535 [illegible] ....m²
Other Floors Existing ....m²
Proposed ....m²
Accessory Building area
Existing ....m²
Proposed ....m²
Total Area of all Buildings
Existing and Proposed ....m²

LEGAL DESCRIPTION CT 12F/513
Valuation Roll Number 24052/25.
Lot 1 DP 30535
Section 5383 & 9166 Block
Survey District Leeston
Certificate of Title Supplied: YES/NO ✓

ESTIMATED VALUES (INCLUDING GST)
Building:
(Not including drainage and Plumbing) $ 5000-00c
Drainage and Plumbing:
(Sanitary work) $ N/A
TOTAL $ 5,000.00

FEES APPLICABLE (INCLUDES GST)

Building Permit	BUPF	$ 85-00c
Building Research Levy	BRLV	$
Drainage and Plumbing	DRPP	$
Engineering Check	BUEN	$
Damage Bond	BUEN	$
Deposit Paid	BUPF	$
TOTAL:		$ 85.00

Signature of Applicant: Sherwyn M. Thom
Name of Applicant: Sherwyn M. Thom
Mailing Address: Springston Rolleston Road, RD5 Ch. Ch.

Deposit Receipt No. ________ Date ________
Receipt No. 67098 Date: 8/2/91
J08178 13/2/91
PERMIT NO. ________ Date: ________

SCHEDULE OF BUILDING PERMIT FEES AND NOTES

(effective from 1 November 1990)

Estimated value of work (excluding any amount on which plumbing and drainage fees are payable).

1. Note: Deposit of $50.00 for work up to and including $10,000; deposit fee $100.00 for work over $10,000. Balance of permit fees payable at time permit is issued. BUPF

2. A structural checking fee of 25% of the building permit is added where engineering checks are required.

All fees include GST.

Value of Building $			Fee $
0	-	3,000	65.00
3,001	-	4,000	75.00
4,001	-	5,000	85.00
5,001	-	6,000	95.00
6,001	-	7,000	110.00
7,001	-	8,000	120.00
8,001	-	9,000	135.00
9,001	-	10,000	145.00
10,001	-	15,000	190.00
15,001	-	20,000	240.00
20,001	-	30,000	300.00
30,001	-	40,000	360.00
40,001	-	50,000	450.00
50,001	-	60,000	540.00
60,001	-	70,000	600.00
70,001	-	80,000	640.00
80,001	-	90,000	685.00
90,001	-	100,000	720.00

BUILDING RESEARCH LEVY

for values over $20,000 $1.15/$1,000 (incl GST). This figure applies to the whole building value and includes all building costs including plumbing and drainage. e.g. a building valued at $20,300 incurs a levy of $24.15 including GST.

Values in excess of $100,000 and not exceeding $500,000 will be assessed at $720.00 plus $4.00 (including GST) per every additional $1,000 or part thereof.

Values in excess of $500,000 will be assesed at $2,320.00 plus $1.00 (incl. GST) per every additional $1,000 or part thereof.

APPLYING FOR A PERMIT

Floor Areas

The area of each floor in buildings of more than single storey must be entered. For site coverage only the area of the ground floor is computed. In accessory buildings the floor area is for computing permissable floor area.

Proposed Use

The proposed use of every building or part of a building must be clearly indicated: e.g. private car garage, private storage shed, ownership flats, leasehold shop etc.

Stormwater Disposal

An approved method of stormwater disposal must be provided to all buildings and must be fixed before occupation of the building.

Drainage and Plumbing

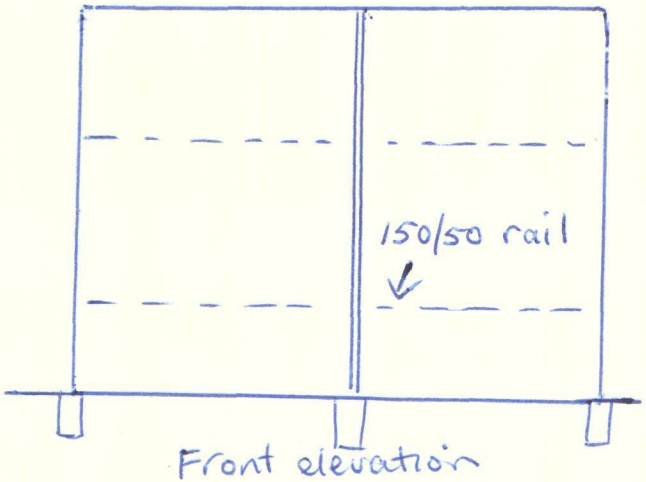
Where drainage and plumbing work is incorporated with any building work the permits must be uplifted at the same time.

Building Permit Requirements:

Applications will not be processed unless 3 copies of all plans (floor plans, elevations, cross sectional plans, site plans) full specifications, and complete land details are submitted with each application together with the necessary permit fees.

Other services for which fees may be charged are:

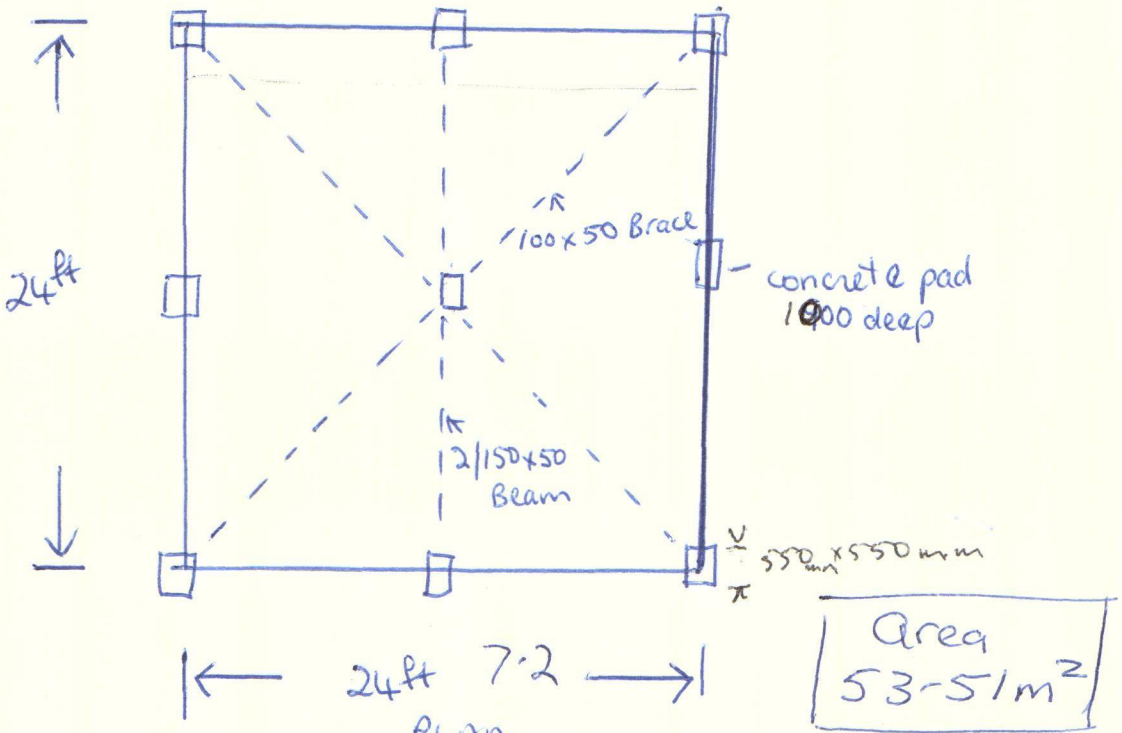
Inspections, planning and siting dispensations, sewer and water connections, vehicle crossings, street drainage, valuation roll search etc.



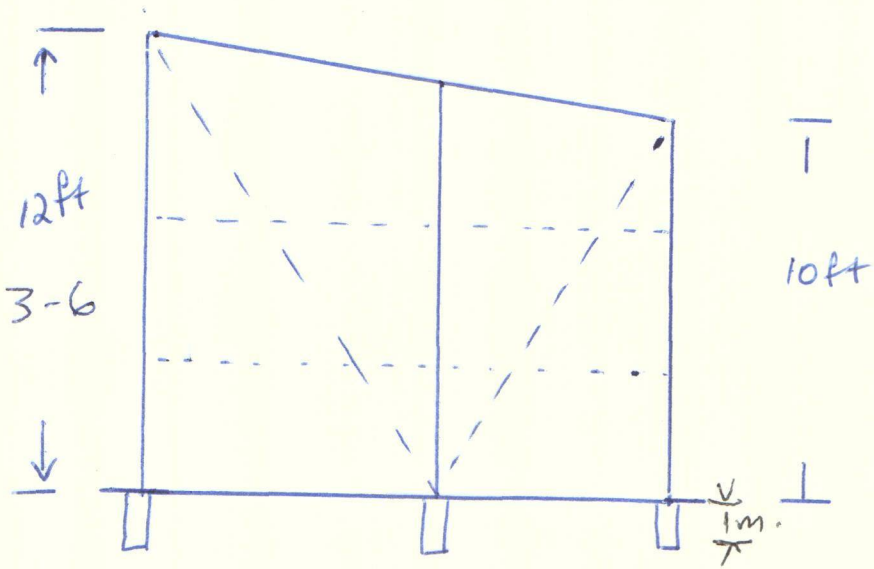
Front elevation

Specifications

Roof	–	Corrugated Iron
Wall Cladding	–	Corrugated Iron
Posts	–	Ex telegraph posts
Purlins	–	150 x 50 treated Pinus
Rails	–	150 x 50 treated Pinus
Bracing	–	100 x 50 treated Pinus
Beams	–	200 x 50 treated Pinus
Pads	–	550 x 550 Concrete
Bolts	–	1/2" Mild steel



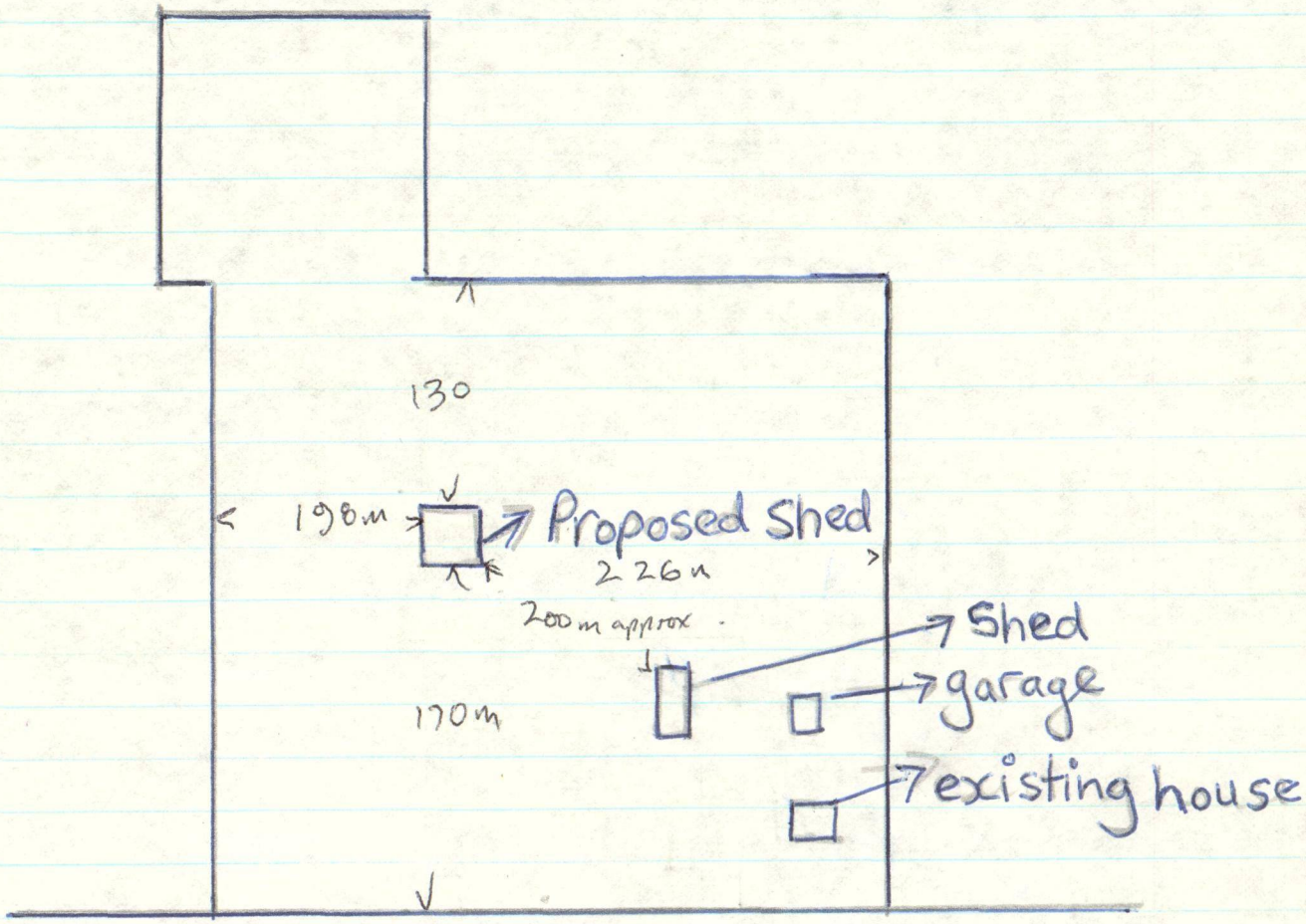
Area
53-51m²



End Elevation

Out Building proposed

Proposed Shed for C.N & S.M. THOM, Springston-Rolleston Rd, RD5, Ch. Ch.



Springston - Rolleston Road

C.N & S.M. THOM

CT 12F/513 19.9545 hectares

Lot 1 DP 30535 pt RS 5383 & 9166

Wiley Geotechnical Limited (2022) DSI Report

Detailed Environmental Site Investigation

Harrow Green

Lot 2 DP 61162

Springston Rolleston Road
Rolleston

Submitted to:

Kevler Developments Ltd.

Wiley Geotechnical Ltd.
Level 1, 10 Logistics Drive, Christchurch
PO Box 21171, Edgeware, Christchurch 8143

Contents

1 Executive Summary

Wiley Geotechnical Limited (WGL) was requested by Kevler Developments Ltd. to provide a Detailed environmental Site Investigation report (DSI) for the proposed residential development at Lot 2 DP 61162, Springston Rolleston Road, Rolleston (herein referred to as 'the site').

This DSI follows on from a Preliminary environmental Site Investigation report (PSI), produced by WGL, dated 3 August 2021, and should be read in conjunction with the PSI report. The PSI concluded that a DSI is necessary, as a HAIL activity has been confirmed on the site. We identified a risk area adjacent to the garage on the north side of the site, where tyres have been stored for a prolonged period. This activity is recognised by the Ministry for the Environment (MfE) as Hazardous Activities and Industries List (HAIL) activity (Category G4 – Scrap yards including automotive dismantling, wrecking or scrap metal yards). Potential contaminants in the soils on the site, resulting from this activity, may pose a risk to human health.

As part of this DSI, soil sampling was undertaken on the site obtain representative samples of the soil within the risk area. The soil samples were transported by WGL to RJ Hill Laboratories (Hills) to analyse the concentrations of contaminants (if any) present and to determine whether or not they pose an acceptable risk to human health. The laboratory results were used to quantify the risks (if any) to human health. We compared the laboratory results to assessment criteria, selected in accordance with the MfE (2011) *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations* (herein referred to as the NES) and the MfE (2011), *Contaminated Land Management Guidelines No. 2, to assess risk to human health*.

Laboratory results indicated that contaminants are not present at concentrations that could pose an unacceptable risk to human health, as a result of the proposed development of the site for residential use. It is therefore recommended that the proposed development of the site be approved as a Controlled Activity under Regulation 9(1).

2 Introduction

Wiley Geotechnical Limited (WGL) was requested by Kevler Developments Ltd. to provide a Detailed environmental Site Investigation report (DSI) to quantify the potential risks to health at Lot 2 DP 61162, Springston Rolleston Road, Rolleston. A Site Location Plan is presented in Appendix 1.

This DSI Report follows the results of a preliminary environmental site investigation (PSI), produced by WGL, dated 3 August 2021. The purpose of this investigation is to assess the potential risks to human health, to determine whether the development can be considered a Controlled Activity under the NES.

This report was prepared in general accordance with the MfE (2021) *Contaminated Land Management Guidelines (CLMG) No. 1: Reporting on Contaminated Sites in New Zealand* and MfE (2021) *CLMG No. 5: Site Investigation and Analysis of Soils*.

3 Objectives

The objective of this investigation was to assess whether the hazardous activities identified in the site's history have resulted in contamination impacts that may pose an unacceptable risk to human health during, and subsequent to, residential development.

4 Site History Summary

This DSI report should be read in conjunction with the PSI report, dated 3 August 2021. Not all information provided in the PSI report has been reproduced in this DSI report.

4.1. Wiley Geotechnical Ltd. PSI Report (2021)

WGL undertook a PSI to assess information relating to the site's past and present uses, as well as to identify any other environmental issues which may be on record. We summarise the findings of the PSI investigation below.

The following activities or industries noted on the MfE Hazardous Activities and Industries List (HAIL; 2011) were identified during review of the site history:

- Category A1 – Agrichemicals including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application.
    - This category is represented by the use of fertiliser on the property.
- Category G4 – Scrap yards including automotive dismantling, wrecking or scrap metal yards.
    - This category is represented by used tyres stored in and around the garage.
- Category G5 – Waste disposal to land.
    - This category is represented by a green waste pile.

While three HAIL activities were identified on the proposed new residential use area, only the storage of tyres at the site is considered to pose a potential risk to human health. Based on aerial imagery and site observations, tyres appear to have been stored next to the garage for approximately 10 years.

The investigations undertaken have identified a risk area adjacent to the garage on the north side of the site where the tyres have been stored. The location of the risk area is shown on the Risk Area Map in Appendix 2. Contaminants related to this activity may be present in the soils. Based on our investigation, we consider that NES regulations apply to the site, according to criteria specified in NES Regulation 5.

4.2. Proposed Development and Regulatory Context

The site is currently undeveloped; historically, it has been used for grazing animals. The majority of the site comprises pasture, with a garage located on the north side of the site and an old deer shed near the centre of the site.

The site is intended to be developed for medium density residential use with lot sizes up to 650 m^2. Based on the evidence gathered during the PSI, the proposed development cannot be considered a Permitted Activity under NES Regulation 8(4)(b) owing to HAIL activities having previously occurred at the site. Therefore, a DSI is required to assess whether the proposed development can be undertaken as a Controlled Activity under NES Regulation 9.

5 Intrusive investigation

The following scope of work was undertaken to assess whether contamination impacts, resulting from the identified HAIL activity, are present at concentrations that may pose an unacceptable risk to human health:

- Collection of two soil samples from two locations within the identified risk area, where tyres have been stored.
- Visual and olfactory inspection of soil samples in the field;
- Submission of two soil samples to Hill Laboratories for analysis of a suite of common heavy metals and Polyaromatic Hydrocarbons (PAHs);
- Interpretation of laboratory results, in terms of the adopted human health criteria for residential land use and excavation / redevelopment earthworks;
- Present the findings of the investigation, including the suitability of the site for redevelopment and residential use, and recommendations to manage impacted areas (if any).

6 Sampling and Analysis Plan

Based on our site observations and historical aerial photographs available on Environment Canterbury's Canterbury Maps website, we developed a soil sampling plan for the site.

To assess whether the proposed development of the site qualifies as a Controlled Activity under NES Regulation 9, two soil samples were taken from two locations within the identified risk area. The locations of our sampling points are considered to be representative of the soils across the risk area.

6.1. Soil Sampling

WGL visited the site on 13 May 2022 to collect soil samples. Two samples were collected from two locations (refer to the Risk Area Map presented in Appendix 2). Sample information is summarised in Table 1.

Table 1: List of Samples

Sample Name and Location	Sample Depth (m)	Soil Type	Laboratory Analytes
SS01	0 – 0.2	Silt with trace sand and gravel.	Heavy Metals, Polyaromatic Hydrocarbons.
SS02	0 – 0.2	Silt with trace sand and gravel.	Heavy Metals, Polyaromatic Hydrocarbons.

6.2. Sampling Methodology

The following was undertaken during the soil sampling works:

- Samples were collected from the surface to 0.2 m below ground level (bgl) at two locations. Two tyres remaining at the site were carefully lifted to obtain soil samples from directly beneath each tyre, then replaced in the same position to avoid further soil contamination. The vegetation growth surrounding each tyre and the soil condition beneath each tyre indicated that the tyres had been in place for some time. The locations, sample names, depths, description of the material represented by each sample and the laboratory analytes are described in Table 1.
- Samples were compressed directly into laboratory supplied containers using a new pair of nitrile gloves for each sample. Prior to sampling, the equipment (hand auger) was decontaminated using a triple wash procedure with potable water, Decon 90 solution and deionised water;
- Visual and olfactory inspections of each sample were performed for indicators of contamination;
- Placement of samples into a chilly bin and transported, under standard WGL chain of custody procedures, to RJ Hill Laboratories (Hills) for analysis; and
- WGL requested that Hills test samples for the analytes described in Table 1.

7 Quality Assurance / Quality Control

The quality assurance / quality control (QA / QC) procedures employed during the works included:

- Standard sample registers and chain of custody records have been kept for all samples;
- The use of Hills, accredited by International Accreditation New Zealand (IANZ), to conduct laboratory analyses; and
- During the site investigation every attempt was made to ensure that cross contamination did not occur through the use of the procedures outlined within this document.

8 Investigation Criteria

The criteria were selected to evaluate the risks to human health during redevelopment earthworks or maintenance of underground services, and for future residential site use.

8.1. NES

The NES, which has been in effect since 1 January 2012, introduced soil contaminant standards (SCSs) for 12 priority contaminants for the protection of human health under a variety of land use scenarios.

The investigation criteria referenced in this report has been selected from the NES to assess risks to human health. Given the proposed use of the site as a medium density residential community, contaminant concentrations in soil were compared to human health criteria for residential use (10% produce).

Contaminant concentrations in soil were also compared to human health criteria for commercial / industrial land use based on an outdoor worker scenario. Commercial / industrial SCSs are used as surrogate values to assess the short-term risk to earthworks contractors on site during future development activities.

8.2. Soil Criteria

The assessment criteria referenced in this report have been selected in line with the NES and the MfE (2011), *Contaminated Land Management Guidelines No. 2* to assess risks to human health for residential (10% produce) land use and during the commercial / industrial land use exposure scenarios, which act as a surrogate for earthworks development and maintenance of underground services.

Where a soil contaminant standard (SCS) was not available, other appropriate criteria for residential (10% produce) land use were sourced from Australian National Environmental Protection Council (1999) *Guideline on the Investigation Levels for Soil and Water*. Other appropriate criteria for commercial / industrial (earthworks) land use were sourced from the United States Environmental Protection Agency (2019) *Regional Screening Levels*, and MfE (1997) *Guidelines for Assessing and Managing Contaminated Gasworks Sites in New Zealand*.

Criteria for background concentrations of heavy metals were taken from the *Background concentrations of selected trace elements in Canterbury soils* report, commissioned by Environment Canterbury (2007). Criteria for background concentrations of polyaromatic hydrocarbons (PAHs) were taken from the Contaminated Land Management User Guide: *Background/Typical concentrations of polyaromatic hydrocarbons (PAHs) in Christchurch urban soils*.

9 Results

Soil testing indicates that the levels of all contaminants analysed were below the adopted criteria for residential (10% produce) land use, and commercial /industrial (earthworks) activity. Results were also below adopted background concentrations. Based on the results of the soil analysis, we consider that the HAIL activities identified on site are highly unlikely to result in a risk to human health should the activity of residential development proceed. The full laboratory certificates are presented in Appendix 3.

10 Conceptual Site Model

A contamination conceptual site model, presented in Table 2, consists of three primary components to allow the potential for risk to be determined. These are:

- Source of contamination;
- Pathway to allow the contamination to mobilise; and
- Sensitive receptors which may be impacted by the contamination.

Table 2: Conceptual Site Model

Source	Pathway	Receptor
Long-term storage of tyres (heavy metals and PAHs)	Dermal absorption (direct contact); Ingestion and / or inhalation of soil; Leaching of contaminants to groundwater; Inhalation of dust;	Maintenance / Excavation workers; Future residents.
Acceptable risk to human health?	Yes: All soil contaminants analysed are below assessment criteria for residential (10% produce) land use, and for future development workers (commercial / industrial criteria).	

11 Conclusions

During this investigation soil samples were collected from locations where soil will be subject to disturbance during earthworks operations.

Based on our investigation, HAIL activities have previously been identified at the site. While three HAIL activities were identified on the proposed new residential use area, only the storage of tyres at the site is considered to pose a potential risk to human health. A risk area was identified, adjacent to the garage on the north side of the site where the tyres have been stored.

Soil sampling was undertaken in the location of the stored tyres to evaluate the risk to future residents and site workers. Soil analysis results indicate that all soil contaminants analysed are below assessment criteria for residential (10% produce) land use, and for future development workers (commercial / industrial criteria). Further, soil samples returned results below adopted background concentrations. Therefore, we consider soil contaminants at the site to be highly unlikely to pose a potential risk to human health.

Based on the current contamination status of the site, given the potential sources identified, it is considered highly unlikely that there will be a risk to human health from chemical contamination of the new residential development, if the following activities are done to the piece of land:

- Subdividing the property, as proposed, for residential use;
- Developing the land for residential use;
- Future occupation of new residential dwellings at the site.

12 Recommendations

It is recommended that residential development of the land be allowed as a Controlled Activity under the NES, because the requirements of Rule 9(1) have been met. Future applications for subdivision / development / disturbance of the site should be assessed in terms of activities identified in this investigation and any potential new HAIL activities that could occur at the site at any time after this report was written.

If any non-naturally occurring material is unearthed at any part of the site during future soil disturbance events, work should stop immediately and a suitably qualified environmental practitioner should be engaged to assess the risk to human health prior to recommencing earthworks.

13 References

Environment Canterbury. (2007), Background concentrations of selected trace elements in Canterbury soils. Report number R07/1/2, ISBN: 978-1-86937-699-4.

Environment Canterbury. (2007), Contaminated Land Management User Guide: Background/Typical concentrations of polyaromatic hydrocarbons (PAHs) in Christchurch urban soils. Report No R07/19.

Environment Canterbury, Canterbury Maps. Retrieved May 2022 from https://apps.canterburymaps.govt.nz/AdvancedViewer/

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LIMITATIONS

(i) This report has been prepared for the use of our client, Kevler Developments Ltd., and their professional advisers, and the relevant Regional Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

(ii) Assessments made in this report are based on the ground conditions indicated from published sources, site inspections and subsurface investigations described in this report based on accepted normal methods of site investigations. Variations in ground conditions may exist between test locations and therefore have not been taken into account in the report.

(iii) This Limitation should be read in conjunction with the IPENZ/ACENZ Standard Terms of Engagement.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned if you require any further information.

Report prepared by

Helen Kellett

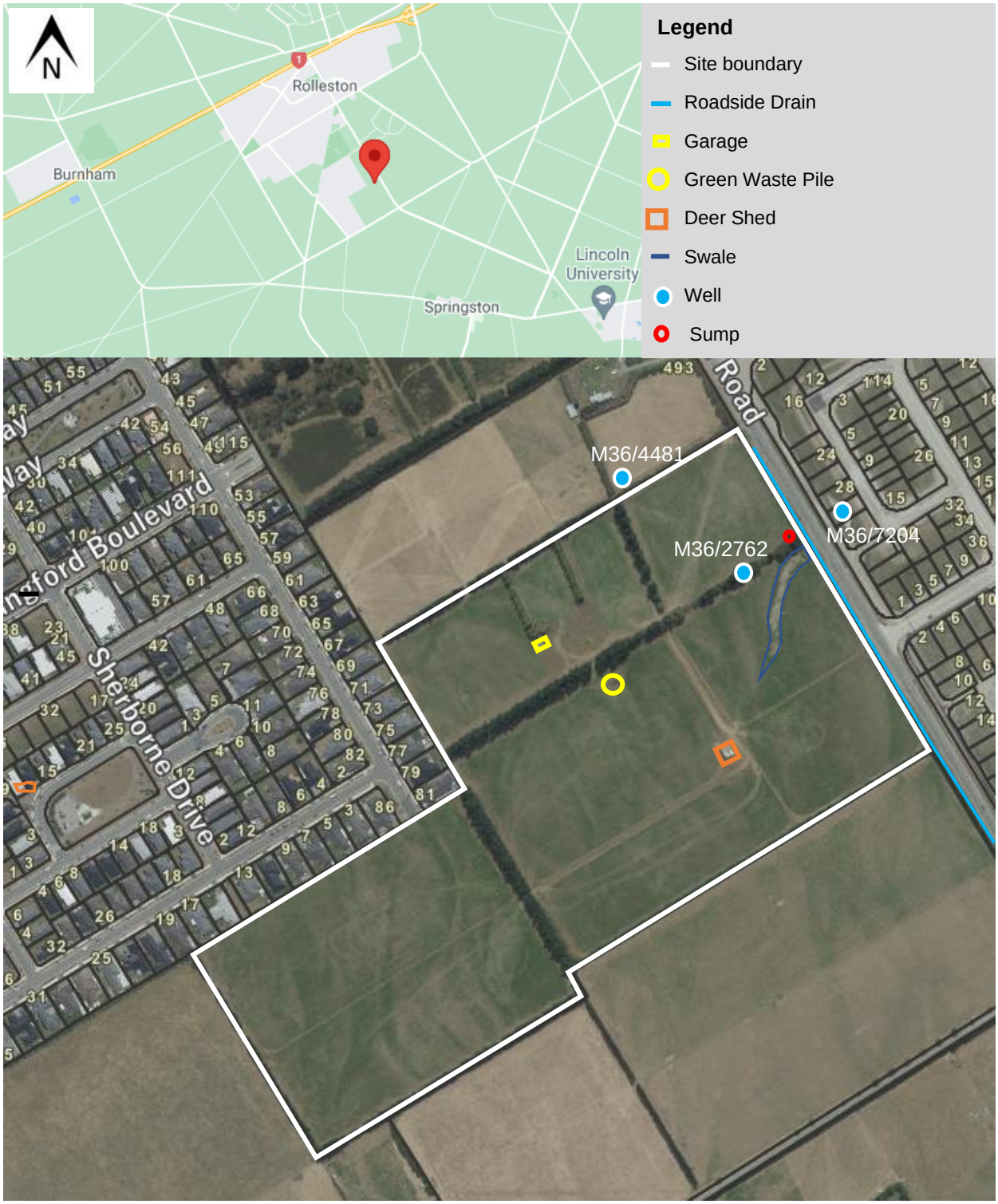
Environmental Scientist

Reviewed by

Claude Midgley, CEnvP

Associate Environmental Scientist

Appendix 1: Site Location Plan



Images sourced from Google Maps and Canterbury Maps. Well locations sourced from Environment Canterbury.

Appendix 2: Risk Area Map

Images sourced from Google Maps

Appendix 3: Laboratory Results

Hill Laboratories
TRIED, TESTED AND TRUSTED

R J Hill Laboratories Limited
28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand

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T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	Wiley Geotechnical Limited	**Lab No:**	2987066	SPv1
Contact:	Helen Kellett	**Date Received:**	13-May-2022	
	C/- Wiley Geotechnical Limited	**Date Reported:**	19-May-2022	
	PO Box 21171	**Quote No:**	76081	
	Edgeware	**Order No:**	C21123	
	Christchurch 8143	**Client Reference:**	C21123	
		Submitted By:	Helen Kellett	

Sample Type: Soil

Sample Name:		SS01 13-May-2022 4:48 pm	SS02 13-May-2022 4:55 pm			
Lab Number:		2987066.1	2987066.2			
Individual Tests						
Dry Matter	g/100g as rcvd	89	90	-	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	4	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.11	0.12	-	-	-
Total Recoverable Chromium	mg/kg dry wt	12	12	-	-	-
Total Recoverable Copper	mg/kg dry wt	5	5	-	-	-
Total Recoverable Lead	mg/kg dry wt	13.1	15.6	-	-	-
Total Recoverable Nickel	mg/kg dry wt	9	8	-	-	-
Total Recoverable Zinc	mg/kg dry wt	54	82	-	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	< 0.3	< 0.3	-	-	-
1-Methylnaphthalene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Acenaphthylene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Acenaphthene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Anthracene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.03	< 0.03	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.03	< 0.03	-	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	0.011	< 0.012	-	-	-
Benzo[e]pyrene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	0.016	< 0.012	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Chrysene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Fluoranthene	mg/kg dry wt	0.013	0.016	-	-	-
Fluorene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.017	< 0.012	-	-	-
Naphthalene	mg/kg dry wt	< 0.06	< 0.06	-	-	-
Perylene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Phenanthrene	mg/kg dry wt	< 0.011	< 0.012	-	-	-
Pyrene	mg/kg dry wt	0.016	0.015	-	-	-

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-2
Total of Reported PAHs in Soil	Sonication extraction, GC-MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	1-2
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-2
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 0.05 mg/kg dry wt	1-2
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-2
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.002 mg/kg dry wt	1-2
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.002 mg/kg dry wt	1-2

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 18-May-2022 and 19-May-2022. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

Ara Heron BSc (Tech)
Client Services Manager - Environmental