REPORT

Tonkin+Taylor

Roxburgh Crescent - Ground Contamination Desk Study

Prepared for
Palmerston North City Council
Prepared by
Tonkin & Taylor Ltd
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1 Introduction

Tonkin & Taylor Ltd (T+T) has been commissioned by Palmerston North City Council (PNCC) to undertake a ground contamination desk study investigation of the 1-42 Roxburgh Crescent site of approximately 50,000 m^2 ("the Site"). The outer boundary of the site is presented below in **Figure 1**.

This report has been prepared in general accordance with the requirements for a PSI (Preliminary Site Investigation) referred to in the NES Soil regulations[1], and as outlined in the MfE Contaminated Land Management Guidelines[2]. The persons undertaking, managing, reviewing, and certifying this investigation are Suitably Qualified and Experienced Practitioners (SQEP), as required by the NES Soil and defined in the NES Soil Users' Guide (April 2012).

This investigation was undertaken in accordance with our proposal dated 21 November 2018 (revision 2) and included collection and laboratory analysis of shallow soil samples.

Figure 1: The Site location (Source: PNCC)

[1] Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.
[2] Ministry for the Environment, updated 2011, Contaminated land management guidelines No. 1: *Reporting on Contaminated Sites in New Zealand*.

1.1 Background and objectives

The past and present land uses at the site are known to have included:

- Commercial analytical laboratory;
- Storage of fuel and other chemicals;
- Metal electroplating;
- Engineering workshops;
- Metal fabrication;
- Bitumen manufacture and/or bulk storage;
- Petrol, diesel and kerosene storage – underground tanks holding 110,000 litres;
- Motor vehicle workshops;
- Commercial refuelling of vehicles;
- Metal and other scrapyards; and
- Commercial painting.

Some of these activities have the potential to cause land contamination. These activities are defined by the Ministry for the Environment in the Hazardous Activities and Industries List (HAIL). If an activity or industry on the HAIL is, or has occurred on a site, the NES Soil applies to proposed soil disturbance and/or land development activities.

T+T has undertaken this investigation to assess whether HAIL activities have occurred at the Site, and the potential for these activities to have resulted in ground contamination. This report also assesses the need for further investigation, and identifies the likely resource consenting requirements for disturbance and/or development of potentially contaminated land, as required under the NES Soil and other relevant regulations.

1.2 Proposed development

We understand that PNCC intends to prepare a plan change to rezone the Site from industrial to residential. This would give effect to strategic direction for a potential rezoned residential development at the Site.

1.3 Scope of work

The scope of work for this investigation comprised the following:

- Review of:
  - Property files and environmental records held by Horizons Regional Council and PNCC;
  - Historic and current certificates of title;
  - Selected historical aerial photographs;
  - Alexander Turnbull Library collection photographic archive;
  - Horizons Regional Council (HRC)'s Selected Land Use Register (SLUR) files for the Site; and
  - Council records of pollution incidents;
- A site walkover inspection;
- Analysis of up to ten soil samples (collected as part of the Stage 1a – Site investigation (CPTs and BHs) and Preliminary Liquefaction Assessment) for metals, asbestos, and polycyclic aromatic hydrocarbons (PAH); and
- Preparation of this document.

This report documents our findings and comments on the potential for ground contamination at the Site, in the context of the proposed plan change to rezone the site from industrial to residential.

2 Site description

2.1 Site identification

The Site is located in Hokowhitu, approximately 2.5 km east of the Square, in Palmerston North. The Site comprises 36 properties. **Table 1** provides site identification information. For ease of reference, the numbers in the first column correlate with the property numbers shown in **Figure 2**. Current certificates of title and a table summarising historical certificates of title (**Table A1**) are provided in **Appendix A.**

Table 1: Site identification

Street address			
1 - 42 Roxburgh Crescent, Hokowhitu, Palmerston North			
	Title number	**Legal description**	**Site proprietor** Privacy Act 2020
1	WN24D/392	Lot 1 Deposited Plan 53779, 1,192 m2	[redacted]
2	WN42A/206	Lot 1 Deposited Plan 75001, 640 m2	
3	WN42A/207	Lot 2 Deposited Plan 75001, 460 m2	
4	WN13A/787	Part Lot 40 Deposited Plan 25417, 846 m2	
5	WN54D/303	Not available	
6	WN5B/345	Lot 26 Deposited Plan 25417, 684 m2	
7	WN31C/76	Lot 1 Deposited Plan 19692, 795 m2	
8	WN5B/344	Lot 25 Deposited Plan 25417, 773 m2	
9	WN6D/1272	Lot 2 Deposited Plan 19692, 753 m2	
10	WN5B/343	Lot 24 Deposited Plan 25417, 784 m2	
11	WN7C/1331	Lot 3 Deposited Plan 19692, 1,066 m2	
12	WN27D/276	Lot 21-23 Deposited Plan 25417, 2,221 m2	
13	WN7C/1332	Lot 4 Deposited Plan 19692, 1,197 m2	
14	WN31C/74	Lot 1 Deposited Plan 60866, 1,497 m2	
15	WN31C/75	Lot 2 Deposited Plan 60866, 5,484 m2	
16	WN41D/651	Lot 1 Deposited Plan 74592, 15,313 m2	
17	PARCEL BOUNDARY	NOT APPLICABLE - ROAD - Roxburgh Crescent	
18	WN7D/1031	Lot 14 Deposited Plan 25417, 1,157 m2	
19	WN14C/175	Lot 15 Deposited Plan 25417, 796 m2	
20	WN5A/390	Lot 3-4 Deposited Plan 28656, 764 m2	
21	WN13D/525	Part Lot 5 Deposited Plan 17578, 847 m2	
22	WN16A/363	Lot 6 Deposited Plan 17578, 886 m2	

	Title number	Legal description	Site proprietor
23	146537	Lot 2 Deposited Plan 22494 and Lot 1 Deposited Plan 32023 and Lot 1 Deposited Plan 32973 and Lot 2 Deposited Plan 322018, 1,615 m2	[redacted]
24	WN8A/1495	Lot 33 Deposited Plan 25417, 579m2	
25	WN8A/614	Lot 32 Deposited Plan 25417, 601 m2	
26	WN8A/306	Lot 31 Deposited Plan 25417, 601 m2	
27	WN5B/347	Lot 30 Deposited Plan 25417, 601 m2	
28	WN5B/346	Lot 29 Deposited Plan 25417, 596 m2	
29	WN5B/341	Lot 28 Deposited Plan 25417, 596 m2	
30	WN42C/927	Lot 2 Deposited Plan 76087, 779 m2	
31	WN27D/779	Lot 2-3 Deposited Plan 58111, 283 m2	
32	WN27D/778	Lot 1 Deposited Plan 58111, 273 m2	
33	WN15C/910	Lot 19 Deposited Plan 25417, 556 m2	
34	WN8B/176	Lot 16 Deposited Plan 25417, 488 m2	
35	WN52D/53	Lot 17 Deposited Plan 25417, 241 m2	
36	WNE1/459	Lot 18 Deposited Plan 25417, 480 m2	
Site area			
Approximately 50,000 m^2			
Zoning			
Industrial			

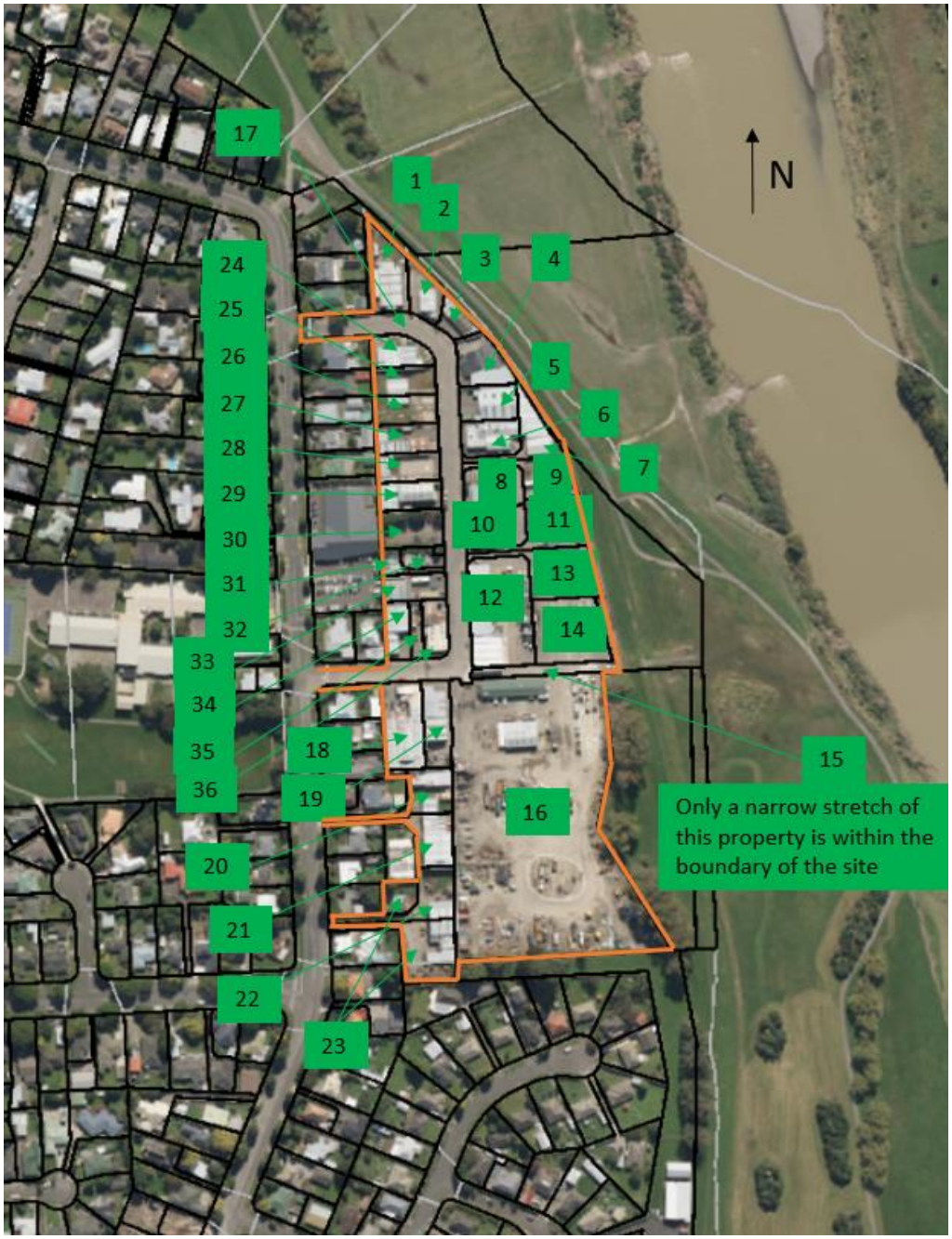


Figure 2: Property identification used within this report for ease of reference

2.2 Site condition

An Environmental Scientist completed a site walkover inspection on 31 January 2019. Relevant observations made at the time of the inspection are summarised below. Selected photographs are included in **Appendix B**.

The Site is currently primarily used for industrial and commercial businesses but at least one residential dwelling is present. The Site contains the following features:

- The land is primarily flat and paved. Some of the surrounding land slopes down to the east towards the Manawatu River, but this is a beyond the stop bank/bridle path;
- Roxburgh Crescent generally runs from north to south of the Site, curving to the west at both the northern and southern ends;
- The south eastern corner is a Higgins site which contains a soil/gravel stockpiles, a scrap yard, laboratory, bitumen bulk storage, painting facilities, chemical storage, wash down area and refuelling station;
- Industrial business warehouses and workshops dominate most of the remaining site. These are predominantly companies which trade in: engineering, automobile repair, construction/joinery, electroplating/metal fabrication, electrical contracting and security;
- Other businesses include scale/balance suppliers, a dance school and a children's playground equipment manufacturer;
- At least one two-storey residential dwelling is present on the Site;
- A warehouse appears to be under construction at the southern end of the Site;
- An uncovered carpark area is located in the central western segment of the Site; and
- At least one warehouse appeared to be disused.

2.3 Surrounding land use

The land uses in the area surrounding the Site include:

- North – Manawatu Riverside Walkway and Bridle Track, beyond that is the Palmerston North Golf Course;
- South – Residential properties, Tillbury Ave;
- East – Manawatu River and Manawatu Riverside Walkway and Bridle Track; and
- West – Ruahine St, Reformed Church of Palmerston North, Winchester School, Winchester Store, residential properties.

2.4 Geology

A summary of available geological information for the area is presented in this section.

2.4.1 Published geology

The published geology beneath the site is described by Lee & Begg, 2002.[3] The site is located on Holocene river deposits, the main rock being alluvial gravel and sub rock listed as sand, silt, clay and peat.

Figure 3: Published geology of the Site (source: Lee & Begg, 2002)

2.5 Hydrogeology

Groundwater is expected to occur at about 8.5 m depth throughout the site. Groundwater is predicted to flow in an easterly direction towards the Manawatu River.

[3] Lee, J.M.; Begg, J.G. (compilers) 2002: Geology of the Wairarapa area: scale 1:250,000. Lower Hutt: Institute of Geological & Nuclear Sciences Limited. Institute of Geological & Nuclear Sciences 1:250,000 geological map 11. 66 p. + 1 folded map.

3 Site history

Historical information relating to the site was collected from a variety of sources. The information presented documents on-site activities, except for the aerial photograph review where comments are also provided on readily observable surrounding land use. The information that has been reviewed is summarised in this section. A more detailed review of the available information is included in **Appendix C.**

3.1 General history of the site and vicinity

The site might have been subject to flooding in 1941. Aerial images of the site are unavailable, but areas nearby to the south appear to be under water.

Prior to and including 1986, the Manawatu River ran close to the eastern side of the site, especially at the northern tip. Between 1966 and 1986, in the wedge of land which widens to the south between the site and the river was a quarry. This was likely alluvial gravel.

At some point between 1986 and 2005 the course of the river changed so that it flowed further away from the site and a grassy area was developed where the river had previously run. At some stage during this period a stopbank and the Manawatu riverside walk was formed.

The site itself appears to be predominantly pasture/bare land through to the 1950s, with only minor buildings beginning to be developed in the south west corner for unknown use. Between 1966 and 1986 aerial imaging shows that the southern end of the site was a market garden and in 1986 the area just north of this appears to be used as a landfill or for stockpiling.

Overall, the site appears to have been used primarily for industrial business use which began extensive development in the late 1950s and 1960s with the construction of various factories, store sheds and workshops. This development continued through the 1970s and 1980s, with some new workshops, warehouses and offices developed and a range of additions/alterations to existing buildings. In the 2000s a property in the north east of the site (38-38A Roxburgh Crescent) was converted partially into a residential dwelling. Some fire damage on the property was noted in 2013 and some buildings appear to have been demolished between 1966 and 1986 and others between 2007 and 2008.

The types of land use of the site have included:

- Building and construction;
- Civil engineers/construction and roading;
- Motor vehicle and engineering;
- Electrical;
- Market gardens;
- Landfill/stockpiling (tentative);
- Residential; and
- Other, including a dance school, playground equipment design and manufacture, scales/weighbridge suppliers, commercial laboratory.

The largest property on the site is occupied by Higgins Contractors Limited for civil engineering, construction and roading. A range of activities have been carried out on site, including:

- Underground and above ground bulk storage of kerosene, petrol, and diesel (up to 110,000 L);
- Bulk storage of bitumen in tanks;
- Polishing shop;
- Engineering workshop;
- Vehicle wash area;
- Dangerous good store – thinners and paints;
- Spray booth;
- Vehicle wash and refuelling areas; and
- Scrapyard for tyres, chemical containers, steel, stockpiles of soil.

Council records of sites associated with hazardous substances

Horizons Regional Council provided information that identifies two potentially contaminated sites within the site, although the information provided did not indicate the exact locations. The nature of the contamination was described as:

- HAIL: F4 – Motor vehicle workshops
  Potential Contaminants: F8 – Hydrocarbon fuels, metals in workshops; and
- HAIL: F8 – Transport depots of yards including areas used for refuelling or the bulk storage of hazardous substances
  Potential Contaminants: F8 – Hydrocarbon fuels, metals in workshops.

The communication from Horizons Regional Council is provided in **Appendix D**.

Incidents involving discharges to air or land

Horizons Regional Council advised of a range of incidents including:

- Report of a “discharge of red substance from pipe near Higgins Depot into Manawatu River”;
- Discharge of degreasing agent from the Higgins yard into the stormwater system;
- Dead stock in the nearby Manawatu river;
- Odour from Higgins site – tar fumes, bitumen, asphalt;
- Diesel spill from Higgins site; and
- Open burning of waste at Zanders Engineering.

The communication from Horizons Regional Council is provided in **Appendix D**.

4 Site characterisation

This section characterises the likely and potential contamination status of the site based on the available information as presented in **Sections 2** and **3** of this report.

4.1 Potential for contamination

This investigation has identified that HAIL activities were (or are likely to have been) undertaken at the site. The activities, potential contaminants and an assessment of the likelihood, potential magnitude, and possible extent of contamination are presented in **Table 2** below. The inferred locations of these activities are presented in **Appendix E.**

Table 2: Potential for contamination

Site use and photograph/Appendix E reference	Land use activity and HAIL reference	Potential contaminants
Higgins have an onsite analytical laboratory (1)	Commercial analytical laboratory sites (A3)	Wide range of organic and inorganic compounds including solvents, acids, metals, and mercury
Market gardens can be seen in 1966 and 1986 aerial images (2)	Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds (A10)	Arsenic, lead, copper, mercury; wide range of organic compounds including acidic herbicides, organophosphates, and organochlorines (eg, endosulfan on golf and bowling greens)
Bulk storage tanks for diesel and kerosene (3)	Petroleum or petrochemical industries including a petroleum depot, terminal, blending plant or refinery, or facilities for recovery, reprocessing or recycling petroleum-based materials, or bulk storage of petroleum or petrochemicals above or below ground (A13)	Hydrocarbons including BTEX, PAHs, and solvents; lead and other metals, particularly if waste oil handled
Higgins site – wash bay, paint shop and lean to, underground storage tanks (possibly removed) (4)	Storage tanks or drums for fuel, chemicals or liquid waste (A17)	Wide range of chemicals (organic and inorganic), and biological hazards
At the front of Higgins Laboratory is an electrical transformer (5)	Electrical transformers including the manufacturing, repairing or disposing of electrical transformers or other heavy electrical equipment (B2)	Polychlorinated biphenyls (PCBs), hydrocarbons, copper, tin, lead, and mercury

Site use and photograph/Appendix E reference	Land use activity and HAIL reference	Potential contaminants
Electroplating Manawatu Ltd (6)	Metal treatment or coating including polishing, anodising, galvanising, pickling, electroplating, or heat treatment or finishing using cyanide compounds (D3)	Metals (zinc, aluminium, cadmium, chromium, lead, copper, and tin), acids (sulphuric, nitric, hydrochloric, and phosphoric), cyanide; flourine and barium (from Al processing)
TigPro Engineering Ltd (stainless steel, mild steel and aluminium fabrication) The Tin Shop (7)	Engineering workshops with metal fabrication (D5)	Metals and oxides of iron, nickel, copper, chromium, magnesium and manganese; range of organic compounds used for cleaning including BTEX, solvents
Higgins site has hot bitumen storage tanks and dispensing units (8)	Asphalt or bitumen manufacture or bulk storage (excluding single-use sites used by a mobile asphalt plant) (E2)	Petroleum hydrocarbons and PAHs
Riverside Motors (historical) GA Zander Ltd (heavy vehicle and general engineers) Higgins workshop Trackweld Manawatu Viper Classics Ian Capstick Motor Bodies (historical) (9)	Motor vehicle workshops (F4)	Hydrocarbons including PAHs, solvents, and metals contained in waste oil
Higgins refuelling station (10)	Service stations including retail or commercial refuelling facilities (F7)	Petroleum hydrocarbons (BTEX, PAHs) and lead
Possible landfill mounds can be seen in the 1986 aerial image to the south of the site. This may be a private stockpile of soil and other items. (11)	Landfill sites (G3)	Dependent on original waste composition, wide range of hydrocarbons and metals, organic acids, landfill gas, and ammonia
Higgins (12)	Scrap yards including automotive dismantling, wrecking or scrap metal yards (G4)	Metals, petroleum hydrocarbons (particularly lube oils), solvents used for cleaning, and PCBs

Site use and photograph/Appendix E reference	Land use activity and HAIL reference	Potential contaminants
Buildings on site were principally developed between the 1950s and 2000s when asbestos was in common use. Building records confirm that asbestos was used in some structures (3 and 17 Roxburgh Crescent). Some buildings have also been demolished. It is possible that asbestos was lost to ground during construction or demolition of the buildings, including burying offcuts/waste materials, and/or by subsequent damage to or maintenance of exterior ACM cladding (e.g. sanding or water blasting for repainting). If asbestos contamination occurs it is most likely to reside in the shallow soils in 'halos' immediately around (or beneath for wastes) the buildings, unless mobilised by soil disturbance or water runoff. (A range of areas could be asbestos contaminated but asbestos is specifically noted in the PNCC property files held at the sites identified as 13a)	Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment (I) (This activity would only constitute a HAIL activity if the asbestos concentrations are sufficient to pose a risk to human health)	Asbestos as fibres, fines or fragments
38 Roxburgh Crescent has been fire damaged (extent unknown) (13b)		Polycyclic aromatic hydrocarbons (PAH), metals
Structures have been present on the site and surrounds when lead-based paints were in use. Damage to or maintenance of painted surfaces (e.g. sanding or water blasting for repainting) has the potential to release lead flakes or dusts to ground. If lead contamination occurs it is most likely to reside in the shallow in 'halos' immediately around the buildings, unless mobilised by soil disturbance or water runoff	Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment (I)	Lead

4.2 Preliminary conceptual site model

A conceptual site model as defined by the Ministry for the Environment in the Contaminated Land Management Guidelines[4], sets out known and potential sources of contamination, potential exposure pathways, and potential receptors. For there to be an effect from the proposed activity there has to be a contamination source and a mechanism (pathway) for contamination to affect human health or the environment (receptor).

A preliminary conceptual site model has been developed for the proposed activity which takes into account the available information about the site, and our understanding of the potential effects on human health and the environment. The model is presented below in **Table 3**.

[4] Ministry for the Environment, updated 2011, *Contaminated Land Management Guidelines No. 5 Site Investigation and Analysis of Soils*

Table 3: Preliminary conceptual site model

Source	Pathway	Receptor	Pathway Assessment
Heavy metal, PAH, organochlorine and metal pesticides contamination in fill material	Dermal contact	Excavation workers and future maintenance workers	Potentially complete should contamination exist and depending on future land use (e.g. residential)
	Ingestion of soil		
	Inhalation of dust		
	Dermal contact	Future site users	
	Ingestion of soil		
	Inhalation of dust		
	Groundwater	Freshwater ecological receptors	Incomplete: Groundwater is not considered a pathway to ecological receptors because the potential contaminants are not highly mobile in groundwater
		Groundwater users	Incomplete: Given that the shallow aquifer is not artesian and given that the shallow aquifer is unlikely to be used for potable purposes given that the area is serviced by PNCC's reticulated water supply it is considered that the shallow aquifer is not classified as sensitive with regard to groundwater use
Asbestos within fill material	Inhalation of dust	Excavation workers and future maintenance workers	Potentially complete should contamination exist and depending on future land use
		Future site users	
Hydrocarbon contamination at the soil/groundwater interface	Outdoor air inhalation (both soil and groundwater)	Excavation workers and future maintenance workers	Potentially complete should contamination exist and depending on future land use
	Indoor air inhalation (both soil and groundwater)	Future site users	
	Groundwater	Freshwater ecological receptors	Incomplete: Given that the nearest water body, Manawatu River, is greater than 100 m from the site, groundwater is not considered a pathway to ecological receptors
		Groundwater users	Incomplete: Given that the shallow aquifer is not artesian and given that the shallow aquifer is unlikely to be used for potable purposes given that the area is serviced by PNCC's reticulated water supply it is considered that the shallow aquifer is not classified as sensitive with regard to groundwater use

5 Investigation works

5.1 Sample locations

Three boreholes were drilled on the site on 17 and 18 December 2018. Borehole locations were selected by T+T on the basis of access, land owner permission, presence of overhead and buried services and traffic management considerations. The borehole locations are shown in **Table 4** below and the map in **Appendix F**.

Table 4: Borehole Summary

BH ID	Location (NZTM)		Ground Surface Elevation RL (m)*	Depth (mbgl)
	Easting (m)	Northing (m)		
BH-01	1824516.755	5529090.489	6.9	11.45
BH-02	1824614.695	5528873.857	8.1	11.45
BH-03	1824583.643	5528754.197	4.9	11.45

* All datum relative to NZVD2016

5.2 Strata encountered

The general profile encountered was:

- Silty/sandy gravel (0-0.8 m, likely fill);
- Silty sand (0.8 – 1.5 m, likely natural from this layer onwards);
- Sandy gravel (1.5 – 6 m);
- Gravelly sand (6 – 8.4 m) with a variable wood layer (7.5 – 8 m); and
- Sandy gravel (8 – 11.45 m).

The first 0 – 0.8 m was generally interpreted to be fill based on location, and gravel roundness and visual observations of differences between this material and the surrounding alluvial river deposits.

5.3 Soil sampling procedure

Soil samples were collected on 5 February 2019 from each of the three cores at depths ranging between 0.05 m and 0.7 m.

Soil sampling was undertaken in general accordance with the requirements of the NES Soil[5], CLMG No. 5[6], and NZ Asbestos Guidelines. Soil samples were collected according to the following procedure:

- Freshly gloved hands were used to collect the discrete soil samples from the core boxes;
- Samples were placed into laboratory supplied sample containers;
- Sampling equipment was decontaminated between cores and depths using clean water and Decon 90 (a phosphate-free detergent) rinses; and
- Samples were shipped to IANZ accredited Hill Laboratories under chain of custody Documentation for analysis.

[5] Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.
[6] Contaminated Land Management Guideline No.5 – Site Investigation and Analysis of Soils, Ministry for the Environment, 2011.

5.4 Laboratory analysis

The laboratory testing was undertaken by Hills Laboratories, which is accredited by International Accreditation New Zealand (IANZ). At least one sample from each of the three boreholes was tested by Hill Laboratories for:

- Asbestos (presence/absence);
- Heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc); and
- Polycyclic aromatic hydrocarbons (PAH).

Results are summarised in **Table G1** and **G2** in **Appendix G** and the original laboratory results are provided in **Appendix H**.

5.5 Laboratory result interpretation

Asbestos was not detected in any of the three analysed soil samples. All five samples analysed for heavy metals and PAH were below the soil contaminant guidelines values for human health and (where data was available) below the predicted background soil concentrations for the area.

However, there was a delay between soil core collection and sampling, so the PAH results may be an underestimation of the actual contamination in the soil. Further, the very limited number of samples and analyses are unlikely to be representative of soil conditions across the 50,000 m^2 site and so further, more comprehensive soil analysis will be required if the site is to be re-developed.

6 Regulatory implications

The rules and associated assessment criteria relating to the control of contaminated sites in the Palmerston North region are specified in the following regulations:

- Health and Safety at Work (Asbestos) Regulation (2016);
- NES Soil; and
- Horizon Region's One Plan.

6.1 Health and Safety at Work (Asbestos) Regulations 2016

The management of asbestos in soils is regulated under the Health and Safety at Work (Asbestos) Regulations 2016 (Asbestos Regulations). In order to help achieve compliance with the Asbestos Regulations, WorkSafe New Zealand has prepared an Approved Code of Practice (ACoP): Management and Removal of Asbestos (September 2016). The ACoP refers readers to the "New Zealand Guidelines for Assessing and Managing Asbestos in Soil" (Asbestos in Soil Guidelines) which were published in November 2017 by BRANZ Ltd.

The key requirements of the Regulations and ACoP are that works involving asbestos contaminated soils must be undertaken with appropriate asbestos controls in place and that contaminated soil removed from site must be taken to an approved disposal site. **Table 5** provides a summary of the requirements as provided in the New Zealand Guidelines for Assessing and managing Asbestos in Soil.

Table 5: Requirements for sites contaminated with asbestos fibres/ fibrous asbestos (AF/FA)

Asbestos fines/fibres in soil (i.e. FA + AF)	Airborne contamination	Summary of requirements as outlined in the NZ Asbestos Guidelines
Greater than 1% w/w	May to lead to airborne contamination that exceeds trace level (i.e. >0.01 fibres/mL)	**Class A asbestos removal works** Work must be carried out by a Class A licenced asbestos removalist. Works are subject to an Asbestos Management Plan, asbestos controls, air monitoring, and clearance. Resource consent required under the NES Soil as a restricted discretionary activity.
Greater than 0.01% but less than or equal to 1%	May to lead to airborne contamination that exceeds trace level (i.e. >0.01 fibres/mL)	**Class B asbestos removal works** Work must be carried out by a Class A or B licenced asbestos removalist. Works are subject to an Asbestos Management Plan, asbestos controls, air monitoring, and clearance. Resource consent required under the NES Soil as a restricted discretionary activity.
Greater than 0.001% w/w but less than or equal to 0.01% w/w	May to lead to airborne contamination that exceeds trace level (i.e. >0.01 fibres/mL)	**Asbestos-related works** Work does not need to be carried out by a Class A or B licenced asbestos removalist. Asbestos controls, PPE, air monitoring, clearance inspections as required and basic decontamination requirements. Resource consent required under the NES Soil as a restricted discretionary activity.
Less than 0.001% w/w	Not likely to lead to airborne contamination that exceeds trace level (i.e. <0.01 fibres/mL)	**Unlicensed asbestos removal work** Standard earthworks controls required. No asbestos specific PPE if SQEP confirms unlikely to exceed trace levels in air monitoring (0.01 f/ml) and/or if air monitoring confirms asbestos below 0.01 f/ml. Air monitoring/clearance not required. Foot wash and used PPE collection area required. Resource consent required under the NES Soil as a controlled activity.

6.2 NES Soil

6.2.1 Applicability

The NES Soil came into effect on 1 January 2012. This legislation sets out nationally consistent planning controls appropriate to district and city councils for assessing contaminants in soil with regard to human health.

The NES Soil applies to specific activities on land where a HAIL activity has, or is more likely than not to have occurred. Activities covered under the NES Soil include soil disturbance, soil sampling, fuel systems removal, subdivision and land use change.

The following **Table 6**, as provided in the NES Soil Users Guide (April 2012), confirms the NES Soil applies to the site.

Table 6: PSI checklist

NES Soil Requirement	Applicable to site?
Is an activity described on the HAIL currently being undertaken on the piece of land to which this application applies?	*Yes*
Has an activity described on the HAIL ever been undertaken on the piece of land to which this application applies?	*Yes*
Is it more likely than not that an activity described on HAIL is being or has been undertaken on the piece of land to which this application applies?	*Yes*
If 'Yes' to any of the above, then the NES Soil may apply. **The five activities to which the NES applies are:**	
Is the activity you propose to undertake removing or replacing a fuel storage system or parts of it?	*No*
Is the activity you propose to undertake sampling soil?	*No*
Is the activity you propose to undertake disturbing soil?	*No*
Is the activity you propose to undertake subdividing land?	*No*
Is the activity you propose to undertake changing the use of the land?	*Yes*
Conclusion: The NES Soil applies to the proposed site within the proposed Roxburgh redevelopment area described in **Section 2** above.	

6.2.2 NES Soil activity status

The NES Soil identifies a number of permitted activity standards relating to the activities to which the NES applies (identified in **Table 6** above). An assessment against the likely compliance with these standards, and therefore the potential need for resource consent under the NES Soil, has been undertaken below:

6.2.2.1 Soil sampling

It is anticipated that further soil sampling will be required should a Detailed Site Investigation (DSI) of the site be required. Soil sampling activities are permitted subject to the following standards:

1 Controls to minimise the exposure of humans to mobilised contaminants must be implemented and maintained until the soil is reinstated to an erosion-resistant state;

2 The soil must be reinstated to an erosion-resistant state within one month after the serving of the purpose for which the activity was done;

3 Soil must not be taken away from the site in the course of the activity, except as samples taken for the purpose of laboratory analysis; and

4 The integrity of a structure designed to contain contaminated soil or other contaminated material must not be compromised.

It is anticipated that any future soil sampling works will be able to meet these permitted activity standards, and it is therefore unlikely that resource consent under the NES would be required for those works.

6.2.2.2 Soil disturbance

It is anticipated that any future redevelopment of the subject site would involve bulk earthworks (i.e. those required to prepare roads and building platforms). Soil disturbance activities are permitted under the NES subject to the following standards:

1 Controls to minimise the exposure of humans to mobilised contaminants must be implemented and maintained until the soil is reinstated to an erosion-resistant state;

2 The soil must be reinstated to an erosion-resistant state within one month after the serving of the purpose for which the activity was done;

3 The volume of the disturbance of the soil of the piece of land must be no more than 25 m^3 per 500 m^2;

4 A maximum of 5 m^3 per 500 m^2 of soil may be taken away per year (excluding material taken away for laboratory testing);

5 Soil taken away in the course of the activity must be disposed of at a facility authorised to receive soil of that kind;

6 The duration of land disturbance must be no longer than two months; and

7 The integrity of a structure designed to contain contaminated soil or other contaminated material must not be compromised.

The site, the whole of which this report considers a HAIL site, has an approximate area of 50,000 m^2. The permitted soil disturbance and disposal thresholds are therefore interpreted to be:

- Soil disturbance – 2,500 m^3; and
- Soil disposal – 500 m^3 per year.

Ground disturbance or excavation works exceeding these thresholds, or that are unable to meet the other permitted activity standards for soil disturbance identified above, will require consent under the NES Soil regulations.

6.2.2.3 Subdividing or changing use

It is understood that any future redevelopment of the site would involve changing the existing land-use, and some future subdivision. Subdividing or changing the existing use of land is a permitted activity under the NES only when the following activities are met:

1 A preliminary site investigation of the land or piece of land must exist;
2 The report on the preliminary site investigation must state that it is highly unlikely that there will be a risk to human health if the activity is done to the piece of land;
3 The report must be accompanied by a relevant site plan to which the report is referenced; and
4 The consent authority must have the report and plan.

Changing land-use or subdivision is currently unable to meet the permitted activity standards identified above. Soil testing (normally in the form of a DSI) will be required to determine the likelihood of risk to human health resulting from any future redevelopment. Subject to the investigation findings a Site Management Plan (SMP) or Remedial Action Plan (RAP) may be required to be submitted in support of a future consent application.

6.3 Regional Plan

The Horizon's One Plan identifies a number of policies, objectives and methods relating to the management of contaminated sites (Objective 3-5 and Policies 3-14 and 3-15), however for the most part it does not specify any rules relating to the management of contaminated sites. The notable exception relevant to this proposal is Rule 14-18, which relates to the discharge of stormwater to surface water and land. The rule provides for the discharges of stormwater to both surface water and land as a permitted activity, subject to a number of standards. Rule 14-18(a) (ii) in particular may be relevant to this site, and has been replicated below:

The discharge must not include stormwater from any:

(a)(ii) Contaminated land where the contaminants of concern may be entrained by the stormwater

If the stormwater discharges resulting from the site during or after redevelopment were unable to meet this standard, it would require resource consent as a restricted discretionary activity under Rule 14-19 of the One Plan.

We recommend that potential for contaminants of concern becoming entrained in stormwater discharge is something could be considered during the preparation of a DSI.

It should also be noted that, depending on the nature of works associated with the redevelopment of the site, a broad range of consents may be required from Horizons Regional Council or Palmerston North City Council (i.e. those relating to general land disturbance, discharges, or diversions of ground and surface water). These and other requirements have not been assessed as part of this PSI.

7 Conclusions

T+T has been engaged by PNCC to undertake a ground contamination desk study investigation for the Roxburgh Crescent re-zoning area. The objective of the investigation was to assess whether HAIL activities have occurred at the site, and the likely implications.

A summary of key findings are presented below:

The ground contamination investigation identified that the following HAIL activities have been (or may have been) undertaken at the site:

- A commercial analytical laboratory site;
- Use of land as a market garden;
- A petroleum depot and/or bulk storage of petroleum or petrochemicals above or below ground;
- Storage tanks or drums for fuel, chemicals or liquid waste;
- Electrical transformers;
- Metal treatment or coating, including electroplating;
- Engineering workshops with metal fabrication;
- Asphalt or bitumen manufacture or bulk storage;
- Motor vehicle workshops;
- Service stations including retail or commercial refuelling facilities;
- A landfill site;
- Scrap yards including automotive dismantling, wrecking or scrap metal yards;
- Structures potentially constructed of or containing asbestos;
- Structures potentially present on the site and surrounds when lead-based paints were in use; and
- A fire damaged structure (extent unknown).

The NES Soil applies to the proposed works because:

- HAIL activities are more than likely to have occurred on the site;
- Land use change/subdivision is proposed; and
- There is no DSI to show that concentrations of contaminants are within background concentrations.

Three shallow soil samples were collected and tested for heavy metals, PAH, and asbestos, showing concentrations below expected background concentrations. However, the conclusions which can be drawn from this are limited because the samples are not likely to be representative of soils across the site that may have been impacted by contamination. This is because insufficient numbers of samples could be tested from this investigation to provide a representative characterisation at the site (eg the fill could contain asbestos and other contamination that would require remedial works to allow residential development).

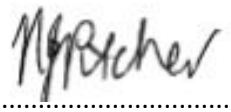
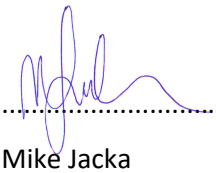
A DSI will be required in order to determine whether future change of land use or subdivision will require a consent under the NES Soil. If a consent is required, there may be a need for further work at the site related to remediation of contamination and/or development and implementation of a Site Management Plan.

8 Applicability

This report has been prepared for the exclusive use of our client Palmerston North City Council, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Recommendations and opinions in this report are based on discrete sampling data. The nature and continuity of subsoil away from the sampling points are inferred and it must be appreciated that actual conditions could vary from the assumed model.

Tonkin & Taylor Ltd

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
	
.....	.....
Natalie Pilcher	Mike Jacka
Environmental Scientist	Project Director

NPIL
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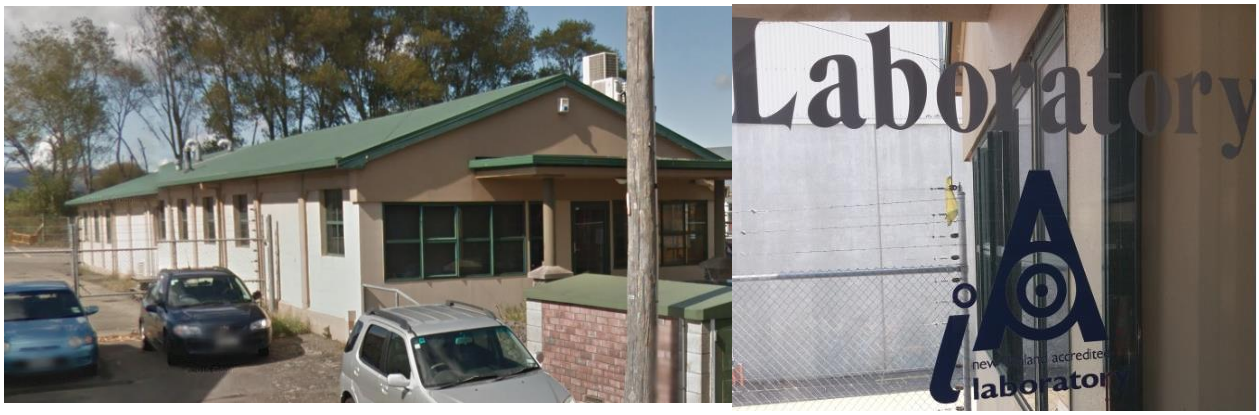
Appendix B: Site walkover photographs



Photograph 1: Higgins analytical laboratory (source: GoogleMaps 2019)

Photograph 2: Market gardens – see 1966 and 1986 historical aerial photographs (Appendix I)

Photograph 3: Higgins diesel and kerosene tanks

Photograph 4a: Example of storage drums (Higgins site)

Photograph 4b: Example of storage tank (Higgins site)

Photograph 4c: Example of storage tanks (Higgins wash area)

Photograph 4d: Example of storage tank (Higgins)

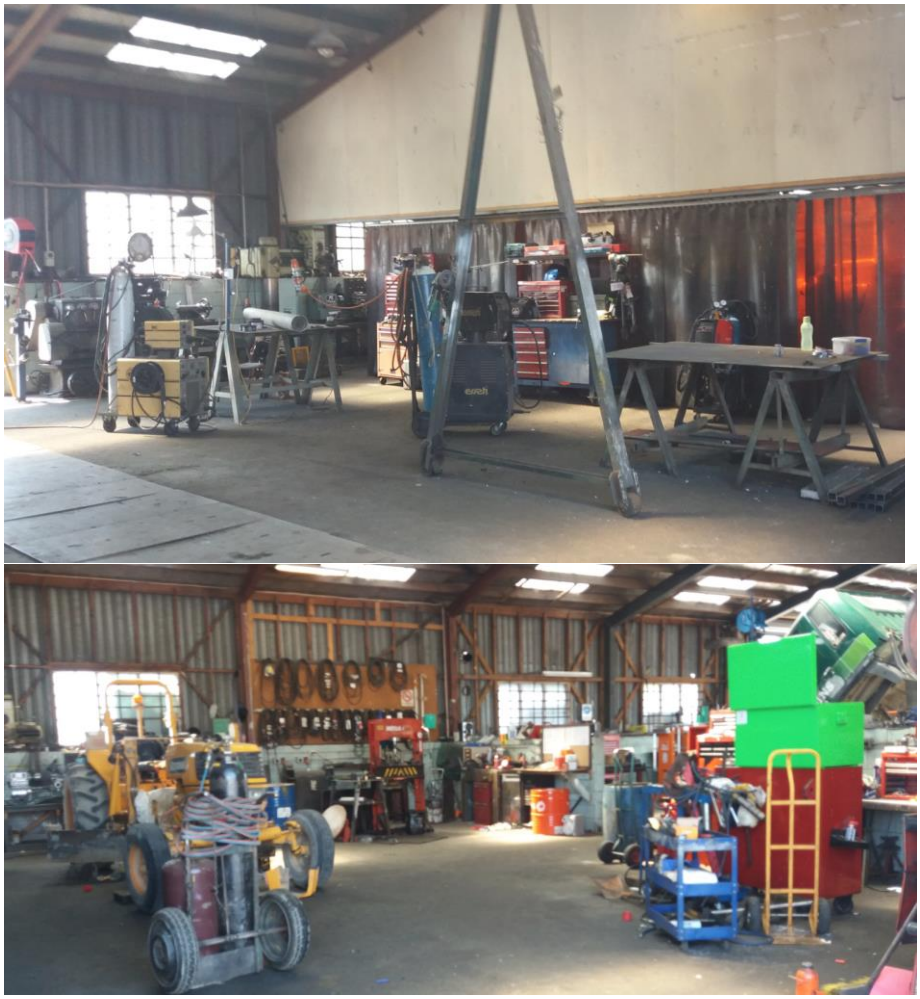
Photograph 5: Electrical Transformer

Photograph 6: Electroplating activities

Photograph 7: TigPro Engineering – stainless steel, mild steel and aluminium fabrication

Photograph 8: Bitumen manufacture and storage

Photograph 9a: vehicle/engineering workshop – GA Zander



Photograph 9b: vehicle/engineering workshops – Higgins

Photograph 9c: vehicle/engineering workshop – Riverside Motors (historical)

Photograph 9d: vehicle/engineering workshop – Trackweld Manawatu Ltd

Photograph 9e: vehicle/engineering workshop – Viper Classics

Photograph 9f: vehicle/engineering workshop – Ian Capstick Motor Bodies (historic)

Photo 10: Refuelling area

Photograph 11: Possible landfill site– see 1986 historical aerial photographs (Appendix I)

Photograph 12a: Scrap yard – Soil stockpile

Photograph 12b: Scrap yard – Storage containers (empty)

Photograph 12c: Scrap yard – Used tyres

Photograph 12d: Scrap yard – Steel

Photograph 13a: 3-5 Roxburgh Crescent – Asbestos cement sheeting on exterior of a building on site identified in Property files held by PNCC

Photograph 13b: 17 Roxburgh Crescent – Asbestos cement on exterior of a building on site identified in Property files held by PNCC

Appendix C: Site History Information

Historical information relating to the site has been collected from a variety of sources. The information presented documents on-site activities, except for the aerial photograph review, where comments are also provided on readily observable surrounding land use. The information that has been reviewed is summarised in this appendix.

C1 Certificates of title

Current and historic certificates of title for the site have been reviewed. A summary of the information reviewed is presented in **Appendix A**.

C2 Historical aerial photographs

Historical aerial photographs from Google Earth Pro, Opus and PNCC's Manawatu Heritage website (https://manawatuheritage.pncc.govt.nz) have been reviewed. Features of the site and surrounding land are summarised from each aerial photograph in **Table C.1**. Copies of the aerial photographs are included in **Appendix I**.

Table C.1: Summary of aerial photograph review

Date, run number and source	Key site features	Surrounding land features
1945 Aerial photo of Palmerston North in – no. 2 South-East quarter of City (Source: https://manawatuheritage.pncc.govt.nz)	The site appears to be predominantly bare land/ pasture with the sourthern end of what is now Roxburgh Crescent visible, running from east to west. Some small buildings and vegetation appear in the SW corner. A square of the site is sectioned off, possibly by a row of trees in the NE but the land within this appears vacant.	The site is flanked by pasture/bare land on all sides, other than the south and south east where some buildings stand of unknown purpose. The Manawatu river is to the east, and Ruahine St is clearly visible to the west.
1954 Aerial shot of Palmerston North taken by a Royal New Zealand Air Force Vampire from 35,000 feet. 2 November, 1954 (Source: https://manawatuheritage.pncc.govt.nz)	A white line appears to run The river appears to run through the site, approximately parallel to the Manawatu River. It is unclear whether this is alluvial deposits or the outline of the stopbank. Some further building development can be seen in the SW of the site and the south of Roxburgh Crescent appears to be formed.	No changes other than some further development of the buildings in the areas identified above.

Date, run number and source	Key site features	Surrounding land features
1966, Opus image	The whole of the Roxburgh Crescent road is now present. A number of buildings have been erected, mostly in the centre of the site and south west. The remainder of the site appears to be agricultural or used for pasture.	An area of what appears to be exposed gravel sits to the east of the site and west of the river. The river runs very close to the edge of the site, especially at the northern tip.
1979 View of the Manawatu River and Eastern suburbs of Palmerston North. (Source: NZ Aerial Mapping Ltd, SN 5408 C/16, https://manawatuheritage.pncc.govt.nz)	Resolution too low for more detailed comment than that the site appears to be occupied by a number of buildings.	Resolution too low for detailed comment.
1986, Opus image	A number of buildings have been erected along the western and eastern edges of the site. At least two smaller buildings have been demolished on the eastern side in the mid section of the site. Some trees have disappeared and been replaced by a large building in the middle of the north half of the site. A number of vehicles are present, mostly in the middle of the eastern side of the site. A market garden area section can be seen in the southern eastern corner of the site. Directly north of this appears to be a landfill mounds/stockpile area.	A quarry appears to be situated on a wedge of land to the east of the southern half of site, just west of the river. The land on the western side of the site is much more developed with many more buildings and trees present. The south western edge of the site is now lined with buildings, likely houses.
2005, Google Earth Pro	The market gardens and landfill type mounds visible in the 1986 image are no longer present from the south eastern section of the site and this appears to now be occupied with vehicles and miscellaneous items. A building in the centre of the site has appeared (now used as the Higgins vehicle shelter) Additional buildings have also been erected in the north east of the site.	The north east of the site is flanked with a grassy area and Manawatu riverside track – the river's course runs much further away from the site than it did in the previous image. The quarry area does not appear to be active and is largely grassed over.
2006, Google Earth Pro	No obvious change from 2005.	No obvious change from 2005.

Date, run number and source	Key site features	Surrounding land features
2007, Google Earth Pro	A set of small buildings to the NW appears to have been demolished (29-31 Roxburgh).	No obvious change from 2005.
2011, Google Earth Pro	A building appears at the site described above.	Some trees have been removed along the Manawatu Riverside walkway to the east of the site.
2012, Google Earth Pro	No obvious change from 2011.	No obvious change from 2011.
2013, Google Earth Pro	No obvious change from 2012 (note that site is partly obscured by cloud).	No obvious change from 2012 (note that site is partly obscured by cloud)e from 2012.
2014, Google Earth Pro	No obvious change from 2013.	No obvious change from 2013.
2015, Google Earth Pro	No obvious change from 2014.	No obvious change from 2014.
2017, Google Earth Pro	No obvious change from 2015.	No obvious change from 2015.

C3 Council property files

No property files were available from Horizons Regional Council.

PNCC provided resource consents that have been applied for or granted on each of the titles as outlined in **Appendix J**.

C4 Council records of sites associated with hazardous substances

Horizons Regional Council provided information that identifies two potentially contaminated sites within the site, although the information provided did not indicate the exact locations. The nature of the contamination was described as:

- HAIL: F4 – Motor vehicle workshops
  Potential Contaminants: F8 - Hydrocarbon fuels, metals in workshops; and
- HAIL: F8 – Transport depots of yards including areas used for refuelling or the bulk storage of hazardous substances
  Potential Contaminants: F8 – Hydrocarbon fuels, metals in workshops.

The communication from Horizons Regional Council is provided in **Appendix D**.

C5 Council contamination enquiry

Horizons Regional Council advised of a range of incidents including:

- Report of a “discharge of red substance from pipe near Higgins Depot into Manawatu River”;
- Discharge of degreasing agent from the Higgins yard into the stormwater system;
- Dead stock in the nearby Manawatu river;
- Odour from Higgins site – tar fumes, bitumen, asphalt;
- Diesel spill from Higgins site; and
- Open burning of waste at Zanders Engineering.

The communication from Horizons Regional Council is provided in **Appendix D**.

Appendix D: Council contamination enquiries

Natalie Pilcher

From: Sarah Carswell <sarah.carswell@horizons.govt.nz>
Sent: Friday, 8 February 2019 12:58 PM
To: Natalie Pilcher
Subject: Horizons comment on various properties around Roxburgh Crescent, Palmerston North RAI 0203 H 00630
Attachments: Roxburgh Crescent, Palmerston North Horizons Indicative Flood Extent and....jpg; One Plan Rule 17-14 & 17-15 - activities affecting flood control & drainage values.pdf; Roxburgh Crescent Palmerston North Horizons Incidents.jpg

Hi Natalie,

Thank you for your request for Horizons comment on various properties around Roxburgh Crescent, Palmerston North regarding property files, environmental records and historic aerial photographs.

Please note that Horizons does not maintain property files.

Flood Risk
As you will be aware the Manawatu River is situated along the eastern portion of these properties.

Horizons holds no observed flood information or flood records for these properties (observed event information from 1976-2018). This does not mean it has not flooded in the past, it means that Horizons has no records of flooding.

As shown on the attached map, some properties adjacent to the Manawatu River are shown to be affected by Horizons indicative flood information. This indicative flood information is based on observations from historic flood events (prior to 1976) drawn at a topographic scale of 1:50,000 and is therefore not relied on for making land development decisions on a site specific scale.

You may wish to check with Palmerston North City Council if they have any additional information on their records and if they have any localised flooding or stormwater information. Please note that Palmerston North City Council have completed Rapid Stormwater Modelling for a 1 in 200 year event (0.5% Annual Exceedance Probability).

Schedule B Values – Horizons Stopbank
There is a Horizons stopbank along the river side of these properties please see the red line indicated on the map attached. The One Plan Rule 17-15 (as attached) requires that resource consent be obtained from Horizons Regional Council for a range of activities occurring within 8 metres of the landward toe of the stopbank, or between the stopbank and the River. There are also One Plan rules for activities with 10 metres of a drain or waterway that has Schedule B values under the One Pan. The types of activities requiring consent include: the planting of trees and shrubs; new buildings and structures; some fencing; land disturbance and depositing of cleanfill; and the upgrade, reconstruction, alteration, extension, removal or demolition of any structure that is maintained by the Regional Council for the purposes of flood control. The need for a consent is due to the potential for such activities to adversely affect the function of the drainage scheme or within a spillway. Should any activities like those listed above be proposed within 10 metres of the drain it is recommended that the owner first contact Horizons Area Engineer Central (Paul Joseph) to confirm any resource consent requirements. I have attached a copy of the relevant rule (One Plan Rule 17-15) for your information.

Known Active Fault Lines
From GNS Science's regional scale information there are is a known active fault line north-east of the property.

You can also access this information on GNS Science's website or clicking on this link: http://data.gns.cri.nz/af/

For more information please contact GNS Science.

Liquefaction
Palmerston North City Council holds the best liquefaction information for the city.

For more information please see PNCC's website:
https://www.pncc.govt.nz/rates-building-property/property-housing/palmerston-north-and-liquefaction/

SAHS (Sites Associated with Hazardous Substances) and Incidents
There are two potentially contaminated sites in this area. The exact location of these SAHS listed on the Horizons database of potentially contaminated sites is unconfirmed please contact Palmerston North City Council for further information.

The location of this site is between properties with the Valuation numbers 14720/176.00, 14720/176.15 and 14720/176.12. Please see the details below:

SAHS: Potential contaminated site

Sahs ID	*700071*
File No	*ERM 05 03N*
Date Created	*02/12/2004*
File Name	*CONTAMINATED SITES REGISTER - PALMERSTON NORTH DISTRICT*
Classification	*Contamination Acceptable Managed/Remediated*
Territorial Authority	*PALMERSTON NORTH CITY*
Easting	*1824489*
Northing	*5528995*

HAIL: F4 – Motor vehicle workshops
Potential Contaminants: F8 - Hydrocarbon fuels, metals in workshops

The property identified as Lot 1 DP 74592 is listed on Horizons database of potentially contaminated sites. Please see the details below:

SAHS: Potential contaminated site

Sahs ID	*700751*
File No	*ERM 05 03CD*
Date Created	*17/07/2015*
File Name	*HIGGINS DEPOT FRANCES HOLDING LIMITED*
Classification	*02. Verified Hail. No Site Investigation*
Territorial Authority	*PALMERSTON NORTH CITY*
Easting	*1824601*
Northing	*5528848*

HAIL: F8 – Transport depots of yards including areas used for refueling or the bulk storage of hazardous substances
Potential Contaminants: F8 – Hydrocarbon fuels, metals in workshops

Attached is a map of the locations of incidents in Roxburgh Crescent. Nearly all of them relate to odour complaints regarding the Higgins sites. Others refer to dead cattle.

If you have any further questions about SAHS or the incidents above please contact our Compliance Team on 0508 800 800 or email hail.enquiries@horizons.govt.nz

Aerial Photography

The aerial photography District Advice use is from Land Information NZ and we often use Google Earth Pro to view historical aerial images. On Google Earth Pro users click on the circular green arrow icon that states 'Show Historical Imagery' and this allows users to scroll from 2005-2018.

Horizons Information Management Team and Central Archives hold a number of aerial photos from the past. I cannot confirm if they include this area. To search the large database of photos would require a large amount of time from our Information Management team which may incur a cost. If you would like to proceed please let me know.

Closing Comments
Horizons has no other relevant information.

If you have any questions or feedback, please let me know.

Kind regards

Sarah Carswell | Coordinator District Advice
Regional Services & Information Group
T 0508 800 800 **E** help@horizons.govt.nz
Horizons Regional Council | Private Bag 11025, Palmerston North

From: Help
Sent: Tuesday, 5 February 2019 2:30 PM
To: District Advice Team <DistrictAdviceTeam@horizons.govt.nz>
Subject: FW: Roxburgh Cres property information request (++RE-73139++)

Hi Ladies,

hard copy to follow
Sarah Carswell (Sarah.Carswell@horizons.govt.nz) contacted Horizons on Feb 5, 2019 10:45 AM with a query relating to **FW: Roxburgh Cres property information request**. Please respond to them directly as necessary

Thanks
Joanne Allardice

Original Request Detail

Hi there,

Please log.

Thanks

Sarah

From: Natalie Pilcher <NPilcher@tonkintaylor.co.nz>
Sent: Tuesday, 5 February 2019 10:29 AM
To: Sarah Carswell <Sarah.Carswell@horizons.govt.nz>; Marianne Boekman <Marianne.Boekman@horizons.govt.nz>
Subject: RE: Roxburgh Cres property information request

Hi there

Could someone please respond to my query below?

Ngā Mihi | Kind regards,

Natalie Pilcher | Environmental Scientist
LLB, BSc, MSc (hons)
Tonkin + Taylor - ***Exceptional thinking together***
Level 4, 2 Hunter Street, Wellington 6011 | PO Box 2083, Wellington, New Zealand
T +6448064946 **www.tonkintaylor.co.nz** T+T profile

Tonkin+Taylor
To send me large files you can use my **file drop**

From: Natalie Pilcher
Sent: Friday, 18 January 2019 3:47 PM
To: DistrictAdviceTeam@horizons.govt.nz
Subject: Roxburgh Cres property information request

Hi there

Roxburgh Cres property information request

Can I please request any property files, environmental records (e.g known pollution incidents or contamination) and historic aerial (or other) photographs held on file relating to the following properties identified in the attached spreadsheet?

If you have any difficulty opening the spreadsheet, please let me know.

Ngā Mihi | Kind regards,

Natalie Pilcher | Environmental Scientist
LLB, BSc, MSc (hons)
Tonkin + Taylor - ***Exceptional thinking together***
Level 4, 2 Hunter Street, Wellington 6011 | PO Box 2083, Wellington, New Zealand
T **+6448064946** **www.tonkintaylor.co.nz** T+T profile

To send me large files you can use my **file drop**

horizons REGIONAL COUNCIL

Horizons Incidents: Roxburgh Crescent, PN

0 40 m

N

Completed Incidents relating to aerial photo provided by District Advice

Incident ID	Incident Date	Notes	Easting	Northing
3669	3/13/1999, 5:36 AM	Complainant reported discharge of red substance from pipe near Higgins Depot into Manawatu River. Complainant sure discharge from Higgins Yard.	1824689	5528795
3700	3/27/1999, 10:24 PM	Complaint about oily material in drain under stopbank. A small amount of degreasing agent had been released from Higgins yard via the old Catchment Board stormwater drain.	1824589	5528895
5722	6/16/2000, 6:00 AM	Report of a diesel spill from Higgins asphalt plant site that occurred at night and was not reported.	1824489	5528995
8638	4/26/2002, 8:00 PM	Foam on Manawatu River. Believe it is coming from Higgins, back of Ruahine and Roxbury Crescent.	1824389	5528795
12651	10/21/2004, 10:55 PM	Dead stinking carcass sighted on bank of Manawatu River,	1824589	5528895
12728	11/25/2004, 10:45 PM	Complaint about piles of rubbish - (tyres/timber/plastics/wire/green waste) on Higgins site at end of Ruahine Street.	1824489	5528995
13147	6/9/2005, 2:54 AM	Dead cow on the river bank next to Higgins at Waterloo park.	1824589	5528795
13195	6/28/2005, 3:56 AM	Dead stock in Manawatu River	1824389	5529095
13198	6/29/2005, 3:15 AM	Dead stock in Manawatu River	1824489	5529095
13224	7/12/2005, 3:57 AM	Dead cow on beach downstream of Ruahine St & Manawatu St	1824689	5528895
13653	10/13/2005, 11:43 PM	Dead stock in Manawatu River	1824589	5528895
16066	6/6/2008, 12:16 AM	Open burning of waste at a trade or industrial premise. Zanders Engineering on Ruahine St.	1824489	5528695
16158	7/26/2008, 1:53 AM	Dead stock in Manawatu River	1824589	5529195
16877	7/6/2009, 11:06 PM	Dead stock in Manawatu River	1824589	5528995
17474	6/21/2010, 9:53 PM	Dead stock in Manawatu River	1824624	5529223
17549	8/16/2010, 9:51 PM	Dead stock in Manawatu River	1824589	5529195
18039	4/23/2011, 8:58 PM	Oily residue in drain close to Roxburgh Crescent, Palmerston North	1824489	5528995
18682	8/23/2012, 3:32 AM	Dead stock in Manawatu River	1824689	5528795
19559	10/31/2013, 11:53 PM	Dead stock in Manawatu River	1824703	5529032

Incident ID	Incident Date	Notes	Easting	Northing
19584	11/7/2013, 12:56 AM	Dead stock in Manawatu River	1824709	5529042
19613	11/14/2013, 11:56 PM	Dead stock in Manawatu River	1824572	5529221
19888	2/25/2014, 3:50 AM	Yellow drum of spray, hooked up on stopbank in the Manawatu River near the vicinity of Manawatu Street and Ruahine Street.	1824670	5529233
19916	3/7/2014, 7:47 AM	Odour - fuel/deisel smell coming from Higgins Contractors	1824525	5528833
20105	6/9/2014, 9:42 PM	Dead sheep carcass down at the river today.	1824596	5528965
20180	7/21/2014, 11:40 PM	Says a drain coming out from higgins is pooling in a pond, run off is oil or some thing simular	1824598	5529022
20847	4/17/2015, 11:49 PM	Dead cow against gryone in Manawatu River. PNCC advised.	1824671	5529229
21774	10/1/2016, 4:42 AM	Odour regarding Higgins Bitumen smell.	1824553	5528974
21780	10/4/2016, 12:49 AM	Odour from Higgins - strong smell of tar	1824568	5529045
21869	12/6/2016, 3:54 AM	Odour from Higgins - strong tar fumes 5/6	1824420	5529156
21972	2/14/2017, 3:05 AM	Odour from Higgins - smells like bitumen	1824473	5528865
21986	2/21/2017, 11:20 PM	Odour from Higgins -Strong smell of bitumen/tar coming from Higgins Depot.	1824467	5528869
22072	3/17/2017, 11:48 PM	Odour from Higgins - this morning next to Wincester School.	1824535	5528818
22097	3/28/2017, 3:33 AM	Odour from Higgins - Smells like bitumen at Wincester school	1824431	5528911
22134	4/14/2017, 1:39 AM	Offensive smell coming from the Higgins plant on Roxburgh crescent. Smell described as coming from tar. 3/6	1824399	5529167
22146	4/11/2017, 8:44 PM	Bad smell of tar coming from Higgins - 4/6 Complainant says it is the worst it has ever been.	1824535	5529010
22286	5/19/2017, 1:10 AM	odour complaint in regards to Higgins Roxburgh Crescent. Bitumen smell	1824463	5528863
22624	10/29/2017, 2:39 AM	Odour Complaint - Roxburgh Crescent, Palmerston North	1824594	5528969
22662	11/28/2017, 7:04 AM	Odour Complaint - Roxburgh Crescent, Palmerston North	1824562	5528842
23010	3/1/2018, 8:49 PM	Odour Complaint - Roxburgh Crescent, Palmerston North	1824465	5528871

Incident ID	Incident Date	Notes	Easting	Northing
12627	10/21/2004, 1:19 AM	Dead cow near river at end of Ruahine Street.	1824489	5529095
12662	10/23/2004, 2:58 AM	Dead cow on walkway smelling,	1824489	5529095
12662	10/23/2004, 2:58 AM	Dead cow on walkway smelling, Rung Jim Sutton, he said he would ring back when his guys had picked it up.	1824489	5529095
13234	7/13/2005, 4:47 AM	Dead cow in River at the end of Ruahine Street	1824489	5529095
16051	5/29/2008, 3:46 AM	Smell of burning plastic - unsure where from	1824389	5529095
17033	10/10/2009, 2:43 AM	Rubbish being dumped down on river bank end of Ruahine St	1824389	5529195
17594	9/14/2010, 3:15 AM	Dead calf and lamb on edge of Manawatu River	1824589	5529195
18060	5/19/2011, 2:15 AM	Dead dog on stop bank. Referred to PNCC	1824622	5529009
21701	8/18/2016, 7:01 AM	Odour from Higgins - strong tar smell continuously 5/6	1824552	5528977
21764	9/27/2016, 2:18 AM	Odour - Higgins Asphalt plant on Roxburgh Crescent	1824601	5528879
21773	9/28/2016, 9:30 PM	Odour from Higgins Asphalt	1824574	5528804
22122	4/10/2017, 9:06 PM	Bitumen smell from Higgins yard (4/6)	1824647	5528907
22348	6/27/2017, 2:52 AM	Odour - Higgins - Bitumen Plant / strong tar smell	1824470	5528868
22869	2/10/2018, 6:50 AM	Odour Complaint - Roxburgh Crescent, Palmerston North	1824465	5528868
7137	3/22/2001, 8:40 PM	Odour from Higgins - bitumen Very noticeable during light easterly to south easterly winds.	1824489	5528895
13145	6/8/2005, 4:30 AM	Dead cow in Manawatu River	1824589	5528995
16385	11/11/2008, 1:23 AM	Dead cow in Manawatu River	1824589	5529195
16425	11/23/2008, 1:43 AM	Dust on southern part of Roxburgh Crescent, PN. Keegan using road and Higgins yard to stockpile clay on river berm.	1824489	5528795
19917	3/7/2014, 8:48 AM	Odour from Higgins - Winchester School very strong smell of asphalt mix	1824434	5528895
20126	6/21/2014, 12:59 AM	Manawatu River - Dead Goat.	1824639	5529177
20853	4/20/2015, 11:22 PM	Dead cattle beast in Manawatu River	1824440	5529135

Incident ID	Incident Date	Notes	Easting	Northing
20853	4/20/2015, 11:22 PM	Dead cattle beast in Manawatu River	1824440	5529135
20991	7/16/2015, 8:25 PM	Dead rabbit carcasses Ruahine Street river access.	1824495	5529167
21718	9/1/2016, 3:51 AM	Dead sheep on river walkway, is decaying and attracting dogs.	1824464	5529175
21752	9/20/2016, 1:47 AM	Odour from Higgins Yard - Bitumen - Site Visit undertaken - No odour detected	1824483	5528864
21970	2/14/2017, 12:28 AM	RFS 679504 and 679707. repeat calls from complainant regarding odour near Higgins, bitumen/tar smell.	1824473	5528865
21987	2/19/2017, 5:57 AM	Odour from Higgins strong bitumen/tar smell 5/6	1824485	5528897
22144	4/11/2017, 8:46 PM	Bad smell of tar coming from Higgins - 4/6	1824535	5529010
22362	6/6/2017, 8:18 AM	Odour Complaint - Higgins depot Roxburgh Cres in Palmerston North	1824592	5528791
22525	10/12/2017, 9:59 AM	Odour Complaint - Higgins Contracting, Palmerston North	1824572	5528798
22642	11/15/2017, 8:10 AM	Odour Complaint - Repeat Caller - Roxburgh Crescent, Palmerston North	1824528	5528884
4125	7/6/1999, 3:42 AM	silty / oily water in drain near Higgins	1824589	5528995
5399	3/11/2000, 7:50 AM	Strong odour from Higgins asphalt plant	1824489	5528895
8662	4/26/2002, 10:00 PM	Foam in Manawatu river	1824589	5528995
11238	10/8/2003, 3:03 AM	Dead deer amongst flood debris of Manawatu River	1824589	5528995

Appendix E: Inferred location of HAIL activities


9f
13b
7
9b
3, 4, 8 & 10
1
4
4 & 10
11
2 & 12
N
7
4
6
13a
9c & 13a
5
9e
4
9a
9d
Roxburgh Cres
Harrow Pl
Pahiatua St

Appendix F: Sample location plan

Borehole Location

Notes:
1. Ground profile based on contours and is approximate only
2. Geology marked on this section is based on the limited available investigation data as shown. Actual ground conditions may differ from the assumed model.
3. Property Boundary based on LINZ and is approximate only

Tonkin + Taylor
Environmental & Engineering Consultants
2 Hunter Street, Wellington, New Zealand
www.tonkintaylor.co.nz

DRAWN	EJWL	Jan 19
DRAFTING CHECKED	MEJ	Oct 19
APPROVED	MEJ	Oct 19
FILE : 85442.0090		
APPROX. SCALE (AT A3 SIZE) NTS		
PROJECT No. 85442.0090		

Aerial view of Cross Sections
Palmerston North City Council
Roxburgh Crescent, Palmerston North

FIG. No. Sample Location Plan

REV. 1

Appendix G: Laboratory results tables

Table G1: Asbestos results

Borehole	Depth (m below ground level)	Asbestos Presence/Absence
BH1	0.5-0.6	Not detected
BH3	0.1-0.2	Not detected
	0.4-0.5	Not detected

Table G2: Metals and PAH results (mg/kg)

Sample number	BH1	BH2		BH3		Soil contaminant guideline values for human health	Predicted Background Soil Concentrations****
Soil type	Silty GRAVEL	Silty SAND	SAND	Sandy GRAVEL	Sandy GRAVEL		
Depth (m below ground level)	0.6-0.7	0.1-0.2	0.4-0.5	0.05-0.15	0.5		
Arsenic	3	3	2	3	3	70*	9.97
Cadmium	<0.10	<0.10	<0.10	<0.10	<0.10	1,300*	0.33
Chromium	14	11	11	12	13	6,300*	56.88
Copper	9	7	9	10	9	>10,000*	48.14
Lead	14.6	7.5	8.8	41	11.0	3,300*	25.83
Nickel	11	11	10	15	12	6,000**	35.15
Zinc	53	44	53	51	45	400,000**	97.97
Benzo[a]pyrene (BAP) equivalent	0.03	<0.03	0.03	2.7	0.16	35*	-
Naphthalene	<0.06	<0.06	<0.06	<0.06	<0.06	190***	-

* National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS), Commercial / industrial outdoor worker.

** National Environment Protection Measure (NEPM), 2013. Guideline on the Investigation Levels for Soil and Groundwater: Commercial/industrial D.

*** User Guide to Guidelines for Assessing and managing petroleum hydrocarbon contaminated sites in New Zealand, Table 4.14: Sand, Commercial/industrial use, all pathways.

**** Expected background concentrations sourced from Landcare Research Predicted Background Soil Concentrations, New Zealand (2016).

Appendix H: Laboratory reports

Hill Laboratories
TRIED, TESTED AND TRUSTED

R J Hill Laboratories Limited
101C Waterloo Road
Hornby
Christchurch 8042 New Zealand

T **0508 HILL LAB** (44 555 22)
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	Tonkin & Taylor	**Lab No:**	2119942	A2Pv1
Contact:	Natalie Pilcher	**Date Received:**	05-Feb-2019	
	C/- Tonkin & Taylor	**Date Reported:**	15-Feb-2019	
	PO Box 2083	**Quote No:**	80842	
	Wellington 6140	**Order No:**	85442.009	
		Client Reference:	85442.009	
		Submitted By:	Natalie Pilcher	

Sample Type: Soil

Sample Name	Lab Number	As Received Weight (g)	Dry Weight (g)	<2mm Subsample Weight (g ashed wt)	Asbestos Presence / Absence	Description of Asbestos Form
BH1 0.5-0.6	2119942.1	1,033.6	924.7	53.0	Asbestos NOT detected.	-
BH3 0.1-0.2	2119942.2	1,054.7	983.7	55.3	Asbestos NOT detected.	-
BH3 0.4-0.5	2119942.3	1,019.0	953.5	58.1	Asbestos NOT detected.	-

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 clean 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.
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
Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-3
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-3
<2mm Subsample Weight	Sample ashed at 400°C, weight of <2mm sample fraction taken for asbestos identification if less than entire fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	-	1-3
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	-	1-3
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1-3

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

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

Rhodri Williams BSc (Hons)
Section Manager - Asbestos

Hill Laboratories
TRIED, TESTED AND TRUSTED

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

T 0508 HILL LAB (44 555 22)
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	Tonkin & Taylor	**Lab No:**	2119933 SPv1
Contact:	Natalie Pilcher	**Date Received:**	05-Feb-2019
	C/- Tonkin & Taylor	**Date Reported:**	13-Feb-2019
	PO Box 2083	**Quote No:**	80842
	Wellington 6140	**Order No:**	85442.009
		Client Reference:	85442.009
		Submitted By:	Natalie Pilcher

Sample Type: Soil

Sample Name:		BH1 0.6-0.7 18-Dec-2018	BH2 0.1-0.2 18-Dec-2018	BH2 0.4-0.5 18-Dec-2018	BH3 0.05-0.15 18-Dec-2018	BH3 0.5 18-Dec-2018
Lab Number:		2119933.1	2119933.2	2119933.3	2119933.4	2119933.5
Individual Tests						
Dry Matter	g/100g as rcvd	89	83	84	93	92
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	3	2	3	3
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	14	11	11	12	13
Total Recoverable Copper	mg/kg dry wt	9	7	9	10	9
Total Recoverable Lead	mg/kg dry wt	14.6	7.5	8.8	41	11.0
Total Recoverable Nickel	mg/kg dry wt	11	11	10	15	12
Total Recoverable Zinc	mg/kg dry wt	53	44	53	51	45
Polycyclic Aromatic Hydrocarbons Screening in Soil						
1-Methylnaphthalene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	0.013	< 0.011
2-Methylnaphthalene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	0.020	< 0.011
Perylene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	0.57	< 0.11
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	mg/kg dry wt	0.03	< 0.03	0.03	2.7	0.16
Benzo[a]pyrene Toxic Equivalence (TEF)	mg/kg dry wt	0.03	< 0.03	0.03	2.8	0.16
Acenaphthylene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	0.38	0.022
Acenaphthene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	< 0.011	< 0.011
Anthracene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	0.151	0.012
Benzo[a]anthracene	mg/kg dry wt	0.012	< 0.012	0.014	1.00	< 0.11
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.020	< 0.012	0.023	1.70	< 0.11
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	0.014	< 0.012	0.015	1.88	< 0.11
Benzo[e]pyrene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	1.26	< 0.11
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	1.68	0.11
Benzo[k]fluoranthene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	0.71	< 0.11
Chrysene	mg/kg dry wt	< 0.011	< 0.012	0.012	1.20	< 0.11
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	0.46	0.026
Fluoranthene	mg/kg dry wt	0.016	< 0.012	0.029	1.25	0.074
Fluorene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	0.023	< 0.011
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.012	< 0.012	< 0.012	1.94	0.12
Naphthalene	mg/kg dry wt	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Phenanthrene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	0.27	0.032
Pyrene	mg/kg dry wt	0.015	< 0.012	0.024	1.44	0.075
Total of Reported PAHs in Soil*	mg/kg	< 0.3	< 0.3	< 0.3	16.0	< 1.2

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 clean 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.
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%.	-	1-5
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	1-5
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. [KBIs:5786,2805,2695]	-	1-5
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	1-5
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	BaP Potency Equivalence calculated from Benz(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 + Chrysene x 0.01 + Dibenz(a,h)anthracene x 1 + 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	1-5
Benzo[a]pyrene Toxic Equivalence (TEF)	BaP Toxic Equivalence calculated from Benzo(a)anthracene x 0.1 + BaP x 1 + Benzo(b)fluoranthene x 0.1 + Benzo(k) fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.1 + 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	1-5
Total of Reported PAHs in Soil*	Sonication extraction, SPE cleanup, GC-MS SIM analysis.	0.3 mg/kg	1-5

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

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

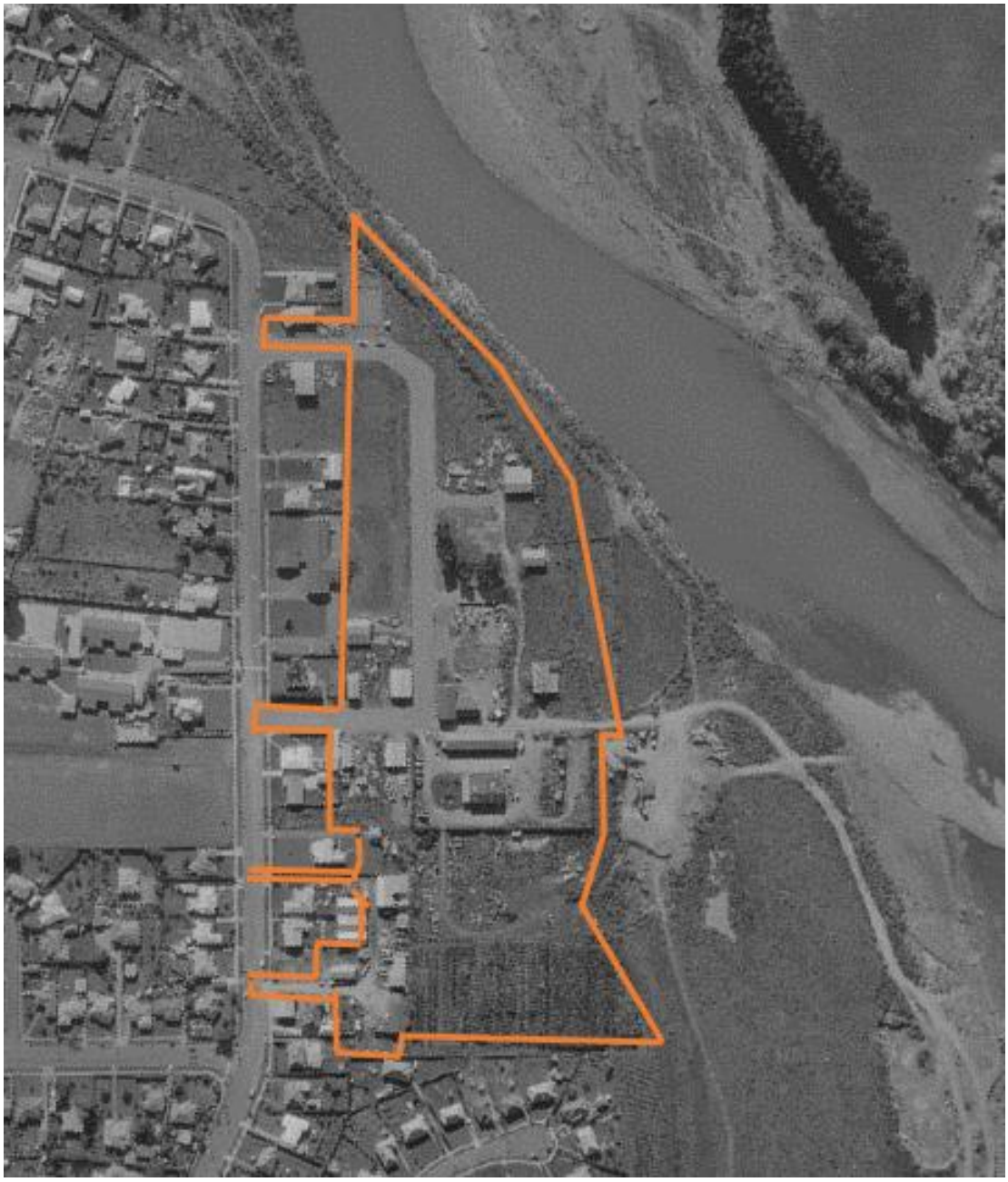
Ara Heron BSc (Tech)
Client Services Manager - Environmental

Appendix I: Historical aerial photographs

Aerial photo of Palmerston North in 1945 – no. 2 South-East quarter of City

(Source: https://manawatuheritage.pncc.govt.nz)

An aerial shot of Palmerston North taken by a Royal New Zealand Air Force Vampire from 35,000 feet. 2 November, 1954 (Source: https://manawatuheritage.pncc.govt.nz)



1966 (Source: Opus)

View of the Manawatu River and Eastern suburbs of Palmerston North, 1979.

(Source: NZ Aerial Mapping Ltd, SN 5408 C/16, https://manawatuheritage.pncc.govt.nz)

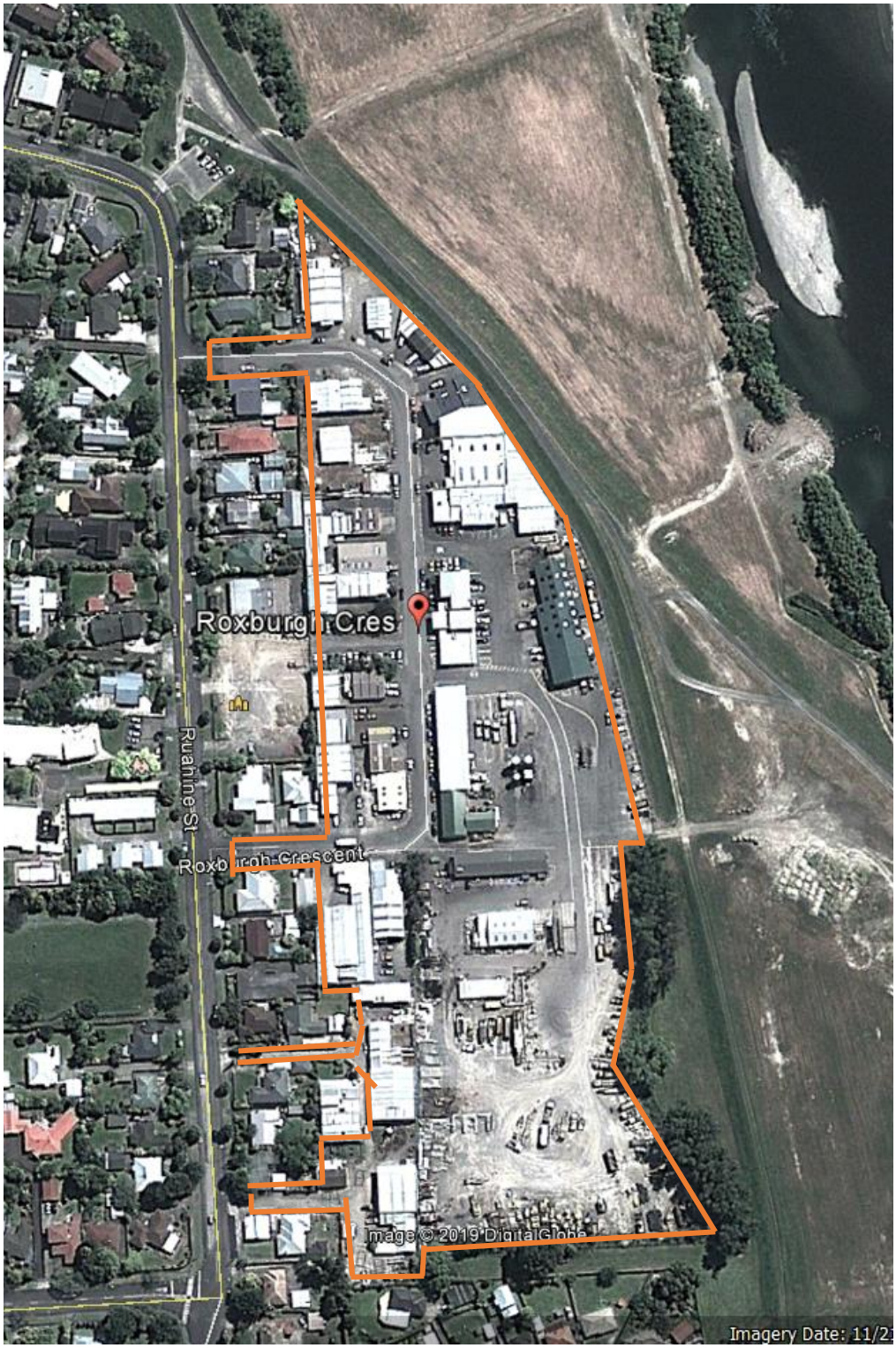
1986 (Source: Opus)

2005 (Source: Google Earth Pro 2018)

2006 (Source: Google Earth Pro 2018)

2007 (Source: Google Earth Pro 2018)

2011 (Source: Google Earth Pro 2018)



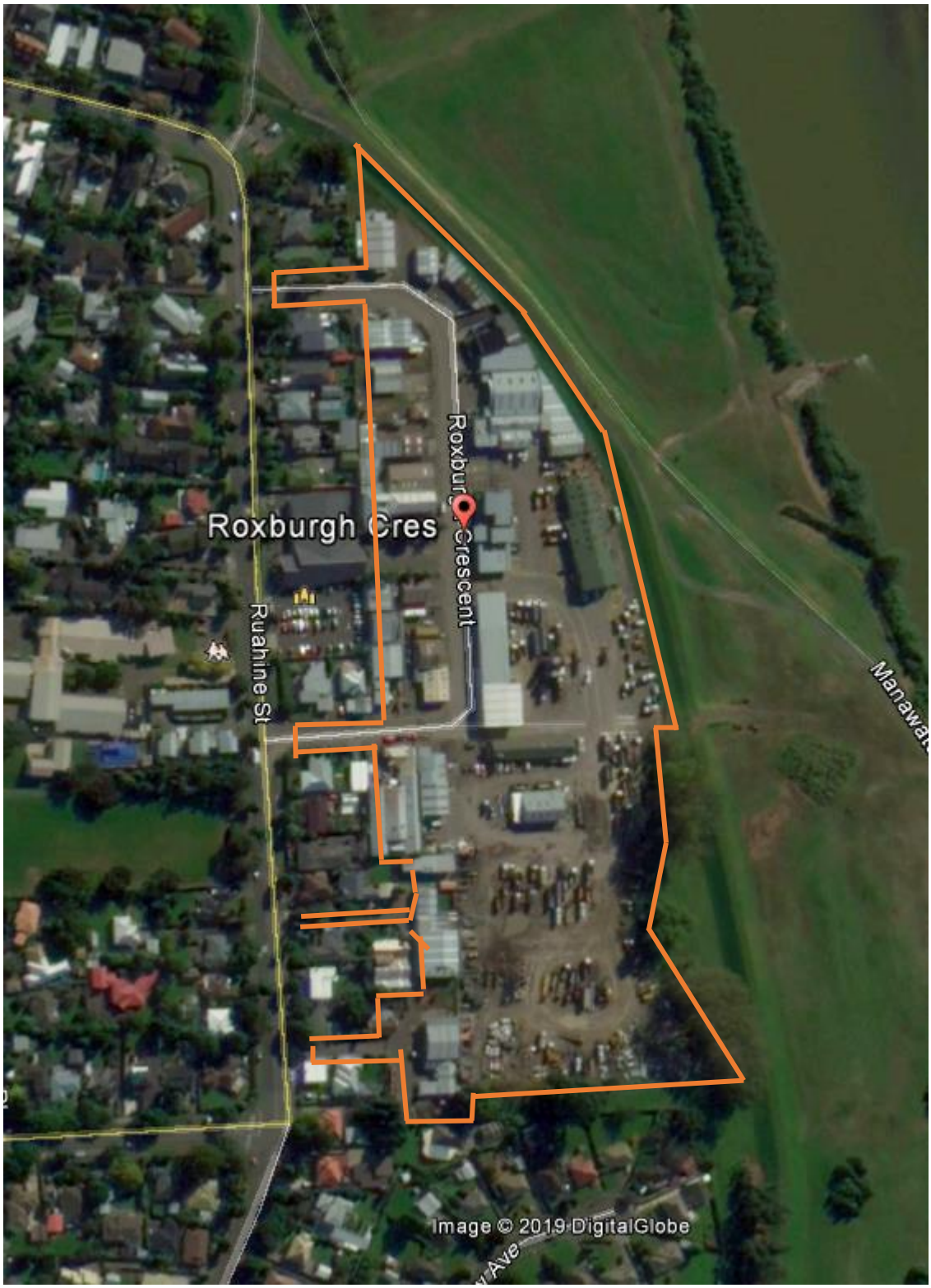
2012 (Source: Google Earth Pro 2018)

2013 (Source: Google Earth Pro 2018)

2014 (Source: Google Earth Pro 2018)

2015 (Source: Google Earth Pro 2018)

2017 (Source: Google Earth Pro 2018)



2018 (Source: Google Earth Pro 2018)

Appendix J: Council resource consent information

3 Roxburgh Crescent

- A building application form, dated June 1979 and applied for by K. W Cook, to erect a workshop addition at 3 Roxburgh Crescent.
- An application for dispensation, dated 8 September 1978 and applied for by Mr K.W Cook to reduce the 1.5 m side yard requirement adjacent to a residentially zoned site and reduce the 3 m requirement for landscaping of the front yard to 1.0 m at 3-5 Roxburgh Crescent.
- A Fire Protection form, dated June 1979, naming K. W. Cook specifying provision of fire fighting equipment, exit signage and exit door
- An application for permit and plumbing and/or drainage work, dated June 1979, applied for by K.W. Cook
- A work brief and plans dated July 1979 to erect a workshop and storage. Mentions asbestos cement sheets to be used on exterior.

4 Roxburgh Crescent

- A building application form, dated June 1969 and applied for by J. H Willson, to relocate building from 296 Broadway to 4 Roxburgh Crescent.
- A building application form, dated December 1971 and applied for by Wilfox Properties, to erect an office building at 4 Roxburgh Crescent.
- A letter from J H Willson Ltd allowing access to the sewer line at 555 Ruahine St in order to build a workshop at Roxburgh Crescent dated September 1974
- A Fire Protection form, dated August 1974, naming J. H Willson specifying provision of firefighting equipment, exit signage and exit door
- A building application form, dated March 1975 and applied for by J. H Willson Ltd to extend store at 4 Roxburgh Crescent.
- A Fire Protection form, dated April 1975, naming J. H Wilson specifying provision of firefighting equipment, exit signage and exit door.
- A building application form, dated July 1985 and applied for by J. H Willson, to erect an office extension (two offices and files room) at 4 Roxburgh Crescent.
- Schedule of materials to be used and work to be done in the erection of an office building for J. H Willson Ltd, dated September 1971.
- An application for permit and plumbing and/or drainage work, undated, applied for by J. H Willson.
- Specification of work in erection of extensions to store in Roxburgh Crescent for J. H Willson Ltd dated February 1975
- Specification of work in erection of extensions to store in Roxburgh Crescent for J. H Willson Ltd dated July 1974
- A building application form, dated July 1974 and applied for by J. H Willson Ltd to extend store at Roxburgh Crescent.
- Letter from Graham Stewart and Associates Ltd to PNCC to remove one fire hose reel from the workshop area at 4-6 Roxburgh Crescent because the water supply comes from a neighbour's property, dated October 2000.
- Letter from PNCC to Graham Stewart and Associates Ltd confirming permission to remove one fire hose reel from the workshop area at 4-6 Roxburgh Crescent, dated October 2000.
- Plans for new workshop building at Roxburgh Crescent, dated November 1971.

8 Roxburgh Crescent

- A building application form, dated May 1980 and applied for by R. C. Isles, to erect an office at 8 Roxburgh Crescent.
- An application for building for additions/alterations: Reframing roof with trusses and new roofing iron, dated February 2000 and applied for by R. C. Isles Ltd
- Code compliance certificate for additions/alterations: Reframing roof with trusses and new roofing iron, dated February 2003 and applied for by R. C. Isles Ltd
- A building application form, dated August 1988 and applied for by R. C. Isles, for an addition to a workshop at 8 Roxburgh Crescent.
- An application for permit for plumbing and/or drainage work at 8 Roxburgh Crescent, dated June 1983, applied for by R. C Isles.
- Multiple internal renovations between 2015 and 2016.

9 Roxburgh Crescent

- A building application form, dated August 1964 and applied for by E & C Fletcher Ltd to erect a storeshed.
- A building application form, dated October 1983 and applied for by A F Fletcher Ltd to erect a warehouse-staff store-office.
- Application and approval of request to cancel a building line restriction dated June 1983 for new warehouse addition
- A Fire Protection form, dated November 1983, referring to "Fletcher warehouse"
- An application for permit and plumbing and/or drainage work, undated, applied for by Fletcher.
- A building application form, dated November 1995 and applied for by B J Eagle to raise stud height and add washroom and toilet at 9 Roxburgh Crescent
- An application for PIMMS to raise existing building, add new roller door, window porch and toilet, dated October 1995 and applied for by B J Eagle.

17 Roxburgh Crescent

- A building application form, dated April 1987 and applied for by K J Douglas to erect an office building at 15 Roxburgh Crescent.
- An application for permit and plumbing and/or drainage work at 15 Roxburgh Crescent, dated April 1987, applied for by R. M Building Contractors.
- Standard Building specification for a building of light framed timber construction

19 Roxburgh Crescent

- A building application form, dated May 1966 and applied for by Wood and Robson Ltd to erect a store shed at 15 Roxburgh Street.
- An application for Permit for Sanitary Plumbing and/or Drainage Work at 19 Roxburgh St, undated
- A building application form, dated May 1981 and applied for by R.E.L Parlane Ltd to erect a 7.5 m x 3.6 m lean-to at 19 Roxburgh Crescent.
- A building application form, dated May 1981 and applied for by R.E.L Parlane Ltd to erect a store (re-erect an existing building) – specifies that it is not to be used as a dangerous goods store
- A plan to relocate shed 50 feet to rear of building, dated May 1981

- An application for permit and plumbing and/or drainage work at 19 Roxburgh Crescent , dated May 1981, applied for by R.E.L Parlane.
- An application for permit and plumbing and/or drainage work at 19 Roxburgh Crescent , dated February 1985, applied for by R McKay.
- An application for permit and plumbing and/or drainage work at 19 Roxburgh Crescent , dated March 1989, applied for by G Staples.
- A scheme plan approval for 19 Roxburgh Crescent for the subdivision of an existing industrial section into 3 lots. Lots 1 & 2 contain existing buildings while lot 3 is a carpark
- A building application form, dated February 1985 and applied for by R McKay to erect a workshop at 19 Roxburgh Crescent.
- A building application form, dated February 1985 and applied for by R McKay to erect a factory at 19 Roxburgh Crescent.

19B Roxburgh Crescent

- A building application form, dated March 1994 and applied for by G Staples to alter/extend an existing electroplating factory.

22 Roxburgh Crescent

- A plan, date unknown, identifying the following:
  - A workshop located in the centre of Lot 3 DP 19692 is to be removed and replaced with a larger workshop.
  - A motor spirit tank and a diesel tank are located to the west of the workshop.
  - Two 3,000 gallon tanks are proposed on the western boundary of Lot 3 DP 19692.
- A building permit, dated May 1958 and issued to Bedford & Leo Ltd, to erect a factory at Lot 3 DP 19692.
- A building application form, dated August 1967 and applied for by D Higgins, to erect a workshop at 22 Roxburgh Crescent.
- A plan, dated December 1969, identifying the following:
  - Two bitumen tanks with an associated control room and switch room are located in the north eastern corner of Lot 4 DP 19692.
  - A workshop is present in the centre of Lot 3 DP 19692.
  - A workshop is proposed to be located in the centre and eastern portions of Lot 2 DP 19692.
- A plan, dated January 1970, identifying that a pit is proposed to be located in the eastern portion of the proposed workshop.
- A building application form, dated February 1970 and applied for by D Higgins & Sons, to erect a workshop at 28 Roxburgh Crescent.
- A letter from Shell Oil New Zealand Limited, dated June 1973, requesting permission to install two 3,000 L tanks in concrete lined pits at D Higgins & Sons Ltd construction yard, Roxburgh Terrace, Palmerston North.
- A building application, dated July 1973 and applied for by D Higgins & Sons, to erect a workshop at Roxburgh Crescent.
- A building application permit, dated May 1986 and applied for by D Higgins, to erect a vehicle shelter at 20 – 22 Roxburgh Street.
- A building application form, dated 1989 and applied for by D Higgins & Sons Ltd, to erect a new bitumen store and resite tanks at 14 – 30 Roxburgh Street.

- A building application form, dated July 1989 and applied for by D Higgins & Sons Ltd, to undertake extensions to an existing workshop at 20 – 22 Roxburgh Street,
- A plan, dated August 1991, showing the location of a laboratory and a proposed truck wash facility at the Higgins Contracting yard.
- A letter, dated June 1999, stating that Higgins Contractors Ltd are proposing to upgrade the existing truck wash which will include the installation of a 2,7000 L grit and oil interceptor.
- Building plans, dated June 2014, identifying the location of a paint shop on Lot 22 DP 25417.
- A building permit application, dated November 2014, to construct workshop bays and to demolish existing buildings at 22 Roxburgh Street.
- A resource consent dated December 2014 to install two new above ground 40,000 litre diesel and 20,000 litre kerosene storage facilities/tanks.

25 Roxburgh Crescent

- A plan, date unknown, indicating that a polishing shop will be present within the factory.
- A building application form, dated November 1970 and applied for by Fineline Furniture, to erect a furniture factory at 25 Roxburgh Street.
- A building application form, dated January 1996 and applied for by Colvillle & Payne Family Trust, to undertake additions to an existing workshop/store at 25 Roxburgh Crescent.

27 Roxburgh Crescent

- A building application form, dated October 1968 and applied for by W. G. Nairne, to erect a workshop at 33 Roxburgh Street.
- A building application form dated August 1972 and applied for by W. G. Nairne, to erect a workshop at 27 Roxburgh Street.
- A letter, dated May 1978, stating that a dangerous goods store would be required to be constructed on site. Up to 450 L of thinners and paints would be stored in the dangerous goods store.
- A building consent application form, dated October 2003, to install a spray booth. An associated document states that paint and paint thinners are to be stored in a locked cupboard.

29 – 32 Roxburgh Crescent

- NIL

33 – 33a Roxburgh Crescent

- A building application form, dated January 1975, to erect a workshop at 33 Roxburgh Street.
- A building application form, dated May 1976, to undertake additions to an existing workshop at 33 Roxburgh Crescent.
- A building application form, dated December 1976, to undertake additions to an existing workshop at 33 Roxburgh Crescent. Associated plans, dated January 1977, state the building will be constructed on behalf of W. G. Nairne and will include the use of hardiflex and fibrolite as construction materials.

34 Roxburgh Crescent

- A building permit, dated May 1958, to erect a factory at Lot 3 DP 19692.
- A building application form, dated July 1982, to erect an addition to a workshop at 34 Roxburgh Street.

38-38A Roxburgh Crescent

- An application for permit for plumbing and/or drainage work, dated June 1985, applied for by Alger.
- Drainage Connection – application and diagram, dated August 1986.
- A building application form, dated July 1984 and applied for by R & E Alger to erect an addition to building at 38 Roxburgh Crescent.
- Building application form, dated June 1985 and applied for by R. E. Alger to erect an additional to the factory at 38 Roxburgh Crescent.
- A building application form, dated July 1986 and applied for by R. E & E. M Alger to erect an addition to warehouse at 38 Roxburgh Crescent.
- An application for permit for plumbing and/or drainage work, dated January 1991, applied for by R Alger.
- Drainage Connection – application and diagram, dated January 1991.
- Building consent application, dated April 2013
- Building consent – Planning processing form, completed by K & M Purser, notes fire damaged building, dated April 2013
- Commercial processing checklist - additions and alterations, dated May 2013 notes repair required to fire separation between the warehouse and dwelling.
- Land Use consent document dated 2007 for Max Keen provides consent despite the car parking shortfall, undersized landscaping, over width access and second vehicle access the site.
- Bracing and roofing plan, June 2017.
    - Application for solid fuel heater (wood stacker freestanding fire), application by Mr & Mrs Purser, dated May 2014
    - Code Compliance Certificate – convert existing workshop to a three bedroom dwelling for M K Construction Ltd, dated December 2009.
    - Building consent for commercial additions and alterations to convert existing workshop to 3 bedroom dwelling with garage, dated July 2007.
    - Building consent to amend first floor framing to convert existing workshop to 3 bedroom dwelling with garage, dated August 2007.
    - Code Compliance certificate applied for by M. A. & K. R. Purser, for repair work to fire separation dated September 2013.
    - Commercial and complex residential application for building consent, to reconstruct three skylights for first floor roof and repair existing fire separation.

40 Roxburgh Crescent

- A building application form, dated March 1966 and applied for by Broadway Engineers to erect a workshop at 40 Roxburgh Crescent.
- A building application form, dated April 1966 and applied for by Broadway Engineers to erect a factory at 40 Roxburgh Crescent.

- An application for permit for sanitary plumbing and/or drainage work, undated, applied for by Everest Softgoods.
- Notice to occupier to clear lands of noxious weeds (Hemlock), dated November 1971
- An application for permit for sanitary plumbing and/or drainage work, dated January 1987 and applied for G L Morgan.

40A Roxburgh Crescent

- A building application form, dated August 1993 and applied for by Fred Harris Woollett to alter an existing building for storage at 40A Roxburgh Crescent.
- A building application form, dated November 1999 and applied for by Kevin Richard Woollett to erect a storage/boat shed at 40A Roxburgh Crescent.
- Landscape Reduction consent approval applied for by The Kevin Richard Woollett Family Trust at 40A Roxburgh Crescent
- Consent approval for construction of a garage onto the existing building for the storage of a boat at 40A Roxburgh Crescent, applied for by Kevin Richard Woollett.

42 Roxburgh Crescent

- A building application form, dated January 1987 and applied for by G. L Morgan to erect a new workshop at 40 Roxburgh Crescent.
- A building application form, dated June 1983 and applied for by G Morgan to erect a workshop and office at 42 Roxburgh Crescent.
- Drainage Connection – application and diagram, dated July 1983.
- Water Connection – application and diagram, undated.
- An application for permit for plumbing and/or drainage work at 42 Roxburgh Crescent, dated June 1983, applied for Morgan.
- A building application form, dated July 1989 and applied for by Ian Capstick Motor Bodies Limited to erect an addition to workshop at 42 Roxburgh Crescent.

565 Ruahine St

- A building application form, dated December 1957, to erect a factory at 569 Ruahine Street.
- A building application form, dated September 1971, to undertake additions to a factory at 565 Ruahine Street. Associated plans state the fibrolite is going to be used as a construction material.
- A building permit, dated January 1974, to erect a factory at Lot 5 DP 17578.
- A building permit, dated January 1974, to erect a factory at 567 Ruahine Street. Associated plans state that sheathing asbestos is to be used.

575 Ruahine St

- A building application form, dated August 1971 and applied for by Scott Gradall Ltd to add to workshop at 575 Ruahine St.
- A Palmerston North City Corporation Water supply application, dated May 1971 and applied for by W Scott for 575 Ruahine St.
- Application for permit for sanitary plumbing and/or drainage work, dated September 1971, and applied for by W Scott for 575 Ruahine St.
- A building application form, dated April 1997 and applied for by GA Zander Ltd to alter/extend a workshop at 575 Ruahine St.

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