Appendix C

Preliminary Site Investigation (PSI) Report

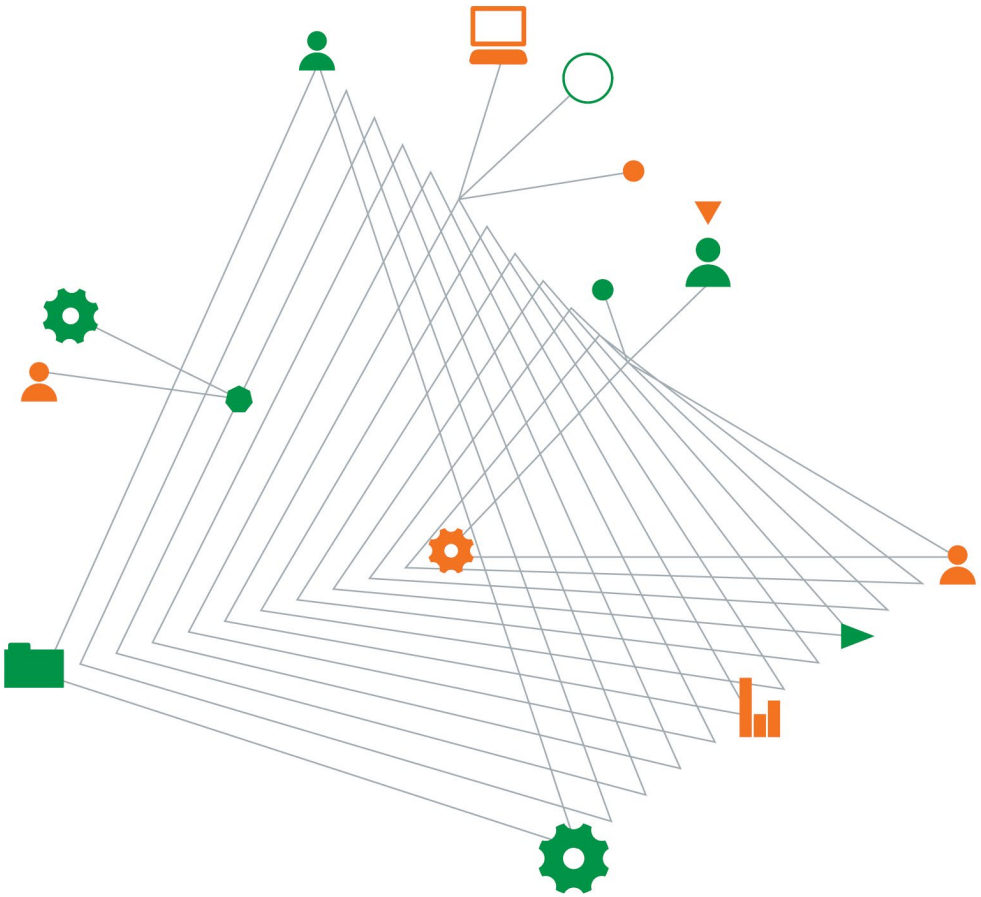
coffey
A TETRA TECH COMPANY

Rolleston West Residential Ltd

Rolleston West Plan Change

Preliminary Site Investigation

9 November 2020



Experience
comes to life
when it is
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Preliminary Site Investigation - Rolleston West Plan Change

Prepared for
Rolleston West Residential Ltd

Prepared by
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9 November 2020

773-CHCGE281253

Quality information

Revision history

Revision	Description	Date	Originator	Reviewer	Approver
V1	Final	9/11/2020	Alistair Brown	Ray Mayor	David Tully
v0 draft	Original Draft	4/11/2020	Alistair Brown	Ray Mayor	David Tully

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1. Introduction

Coffey Services (NZ) Limited (Coffey) has been commissioned by Rolleston West Residential Ltd ('the client') to conduct a Preliminary Site Investigation (PSI) to support the proposed Rolleston West Plan Change and future subdivision for the properties located off Dunns Crossing Road, Rolleston, Canterbury.

The proposed Plan Change area comprises two land parcels (the "site", Figure 1) herein referred to as Holmes Block and Skellerup Block located on the western side of the Rolleston Township.

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) (NESCS) Regulations apply to selected activities on sites where an activity or industry on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) is, has, or is more likely than not to have occurred. The purpose of this PSI was to assess the potential for contaminants to have been deposited at the site as a result of current and/or historical activities undertaken within or in the immediate vicinity of the site and accordingly determine if any further investigation work is required under the NES.

This PSI report has been reviewed by a Suitably Qualified and Experienced Practitioner (SQEP), as required by the NES.

1.1. Objectives

The objectives of this PSI were to:

- Identify potentially contaminating (HAIL) activities or potential sources of contamination that might have occurred or exist at the site.
- Confirm the suitability of the land for subdivision and provide recommendations regarding additional works required prior to any future development.

1.2. Scope of works

The scope of work was undertaken in general accordance with the staged process defined by the Ministry for Environment (MfE) Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils (revised 2011) and the findings are presented in accordance with the MfE Contaminated Land Management Guideline No.1: Reporting on Contaminated Sites in New Zealand (revised 2011). Both the above documents are incorporated by reference into the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES).

In summary, the following scope of works was undertaken:

- Review of Environment Canterbury's Listed Land-Use Register (LLUR) for the site.
- Review of published geological maps and the Coffey database to appraise likely soil and groundwater conditions at the site.
- Review of selected publicly available aerial photographs or other accessible historical photographs.
- Site walkover, focussed on areas with structures or visible land disturbance to consider land contamination indicators (e.g. visual evidence of waste dumping/material spills, chemical storage and/or usage areas, anomalous die-back in vegetation, ground staining).

- Preparation of this PSI report. As required by the NESCS, this report was reviewed and approved by a suitably qualified and experienced practitioner (SQEP).

2. Site information

2.1. Site description

The Holmes and Skellerup Blocks are both rectangular in shape with predominately flat topography, situated approximately 2 km south-west of the central Rolleston township and approximately 24 km south-west of Christchurch's central business district. Details of the two blocks are listed in Table 1 and their locations are shown on Figure 1.

Holmes Block is bordered by agricultural land-use south-west, Main South Road north-west, Dunns Crossing Road and West Rolleston School north-east and Burnham School Road to the south-east.

Skellerup Block is bordered by agricultural land-use north-west, south-west and south-east and Dunns Crossing Road to the north-east.

Table 1: Site information

Address	Legal Description	Property Area (Hectares)
Holmes Block - Dunns Crossing Road, Burnham	Section 2 SO 480906	87.53
Skellerup Block - Dunns Crossing Road, Rolleston	Part RS 31356, Part Section 4 RES 1342, Part RS 31354	72.69

2.2. Geology and hydrogeology

The geology of the site is shown on the Institute of Geological and Nuclear Sciences (GNS) geological map sheet 21: Christchurch, scale 1:250,000. The map indicates the site is underlain by the Burnham Formation for the Otiran Stage of the Hawera Series. The underlying geology comprises 1-3m thick stratal sets of gravel, intercalated with sand and loess-silt layers.

The nearest surface water body to the site is the Selwyn River located approximately 6 km to the south-west of the site/s. This river flows in a south-east direction eventually feeding into Lake Ellesmere approximately 13 km south-east of the site.

For further information, refer to Coffey's Geotechnical Assessment Report produced in November 2020.

2.3. Site history

The following sections summarise the historical activities undertaken within or in the immediate vicinity of the site, as determined from the information sources reviewed during this PSI.

2.3.1. Listed land-use register

Environment Canterbury's LLUR was accessed on 4 November 2020, however, it was noted that the LLUR currently has no information about HAIL sites on these land parcels (Holmes and Skellerup Block).

Two investigations were recorded within the Council records for the Holmes Block (Section 2 SO 480906), one preliminary site investigation in 2013 and a detailed site investigation in 2014, however, these investigations related to the West Rolleston Primary School site (corner of Dunns Crossing and Burnham School Roads), which is outside of the proposed site/s area. These investigation reports were not made available during this PSI.

2.3.2. Historical aerial photographs

Historical aerial photographs of the site and the surrounding area taken between 1942 and 2019 were sourced from the Local Government Geospatial Alliance's (LGGA) Retrolens and the Canterbury Maps Viewer. A summary of observations made from the review of these photographs is provided below. Copies of selected aerial photographs reviewed are included in Appendix A.

Both sites were in use as agricultural land from the initial 1942 historical aerial images with a single residential structure on the central north-western boundary of the Holmes Block, however, this is no longer present in the 1994 historical aerial image. No structures appear on the Skellerup Block in any of the historical aerial images reviewed. Both the Holmes and Skellerup Blocks appear to have remained in use as agricultural land through all of the historical aerial images reviewed to present day.

The aerial imagery indicated that the site appears to have been used for agricultural purposes since before 1943 and may be impacted by HAIL category A10 (persistent pesticide bulk storage or use).

2.3.3. Site walkover

Coffey staff conducted a site walkover of the site on 4 November 2020. A conversation held with the current site owner and on-site observations made during the site walkover of the two properties indicated the following:

<u>Holmes Block</u>

- Ex forestry, converted to crops mid 2000's.
- Crops included lucerne, barley and maize.
- Some young stock grazed.
- No known offal pits or borrow areas.

<u>Skellerup Block</u>

- Ex forestry, converted to crops mid 2000's.
- Crops include kale.
- Some grazing and silage.
- No known offal pits or borrow areas.

No staining or significant plant die off visual evidence of chemical storage was observed on any of the properties during the site walkover.

3. Summary

Coffey was contracted by the client to conduct a PSI for the properties (Holmes and Skellerup Block) located off Dunns Crossing Road, Rolleston (the 'site', Figure 1). This investigation has been undertaken to confirm the suitability of the site for plan change and associated subdivision.

Coffey completed a review of Environment Canterbury's LLUR, published geological maps, publicly available historical aerial photographs and completed a site walkover of the site on the 4 November 2020.

On the basis of the information reviewed and collected, Coffey has identified actual or potential HAIL activities to likely have occurred on-site as summarised in Table 2:

Table 2: Identified actual or potential HAIL activities

Actual/Potential HAIL Activities	Land Use	Information Source	Considered Risk Potential for Contamination to Surrounding Environment
Persistent pesticide bulk storage or use (HAIL Category A10)	Use of pesticide and other agrochemicals in agricultural activities	Site walkover observations, historical aerial photographs.	The risk potential to the underlying soil and groundwater is considered **low** due to: • Relatively long period of use (since prior to 1943). • Likely use of non-environmentally persistent chemicals in the paddocks.

The site walkover and review of site history information indicates the following key potential receptors that may be relevant to the site:

- Earthworks contractors who may come into contact with potentially contaminated soil during any proposed future development works.
- Future occupiers of the properties within the site.

4. Recommendations

Due to the likely presence of HAIL activities on the site, the NESCS regulations are considered to apply to the site. Subdividing or changing land use is a permitted activity under section 8(4)(b) of the NESCS if the report on the site states that it is highly unlikely that there will be a risk to human health if the activity is done to the piece of land.

The potential of contamination to soil associated with the identified potential sources of contamination are considered low (refer to Table 2 above), depending on the activity identified. It is considered unlikely that there will be a risk to human health with the proposed plan change and subdivision providing that the potential contaminant source areas listed in Table 2 are assessed.

The site is considered to be suitable for plan change and subdivision, with any consent granted for the site, conditional on a detailed site investigation (DSI) being carried out prior to any earthworks and or building consents being granted.

Coffey recommends soil characterisation samples are taken from across the site to create a detailed site investigation (DSI) prior to earthworks consent being granted to ensure elevated contaminates and excessive use of pesticides are not present.

5. Limitations

The findings of this report should be read together with “Important Information ‘About Your Coffey Environmental Report’ (attached).

6. References

Environment Canterbury's listed land-use register. https://llur.ecan.govt.nz/ (accessed 4 November 2020)

Institute of Geological and Nuclear Sciences (1992). Geological Map 1, scale 1:25,000: Geology of the Christchurch Urban Area.

MfE (2003). Contaminated Land Management Guideline No. 1: Reporting on Contaminated Sites in New Zealand. Ministry for the Environment, Wellington, New Zealand. (Revised 2011).

MfE (2004). Ministry for the Environments Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils. Ministry for the Environment, Wellington, New Zealand. (Revised 2011).

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

Important information about your **Coffey** Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

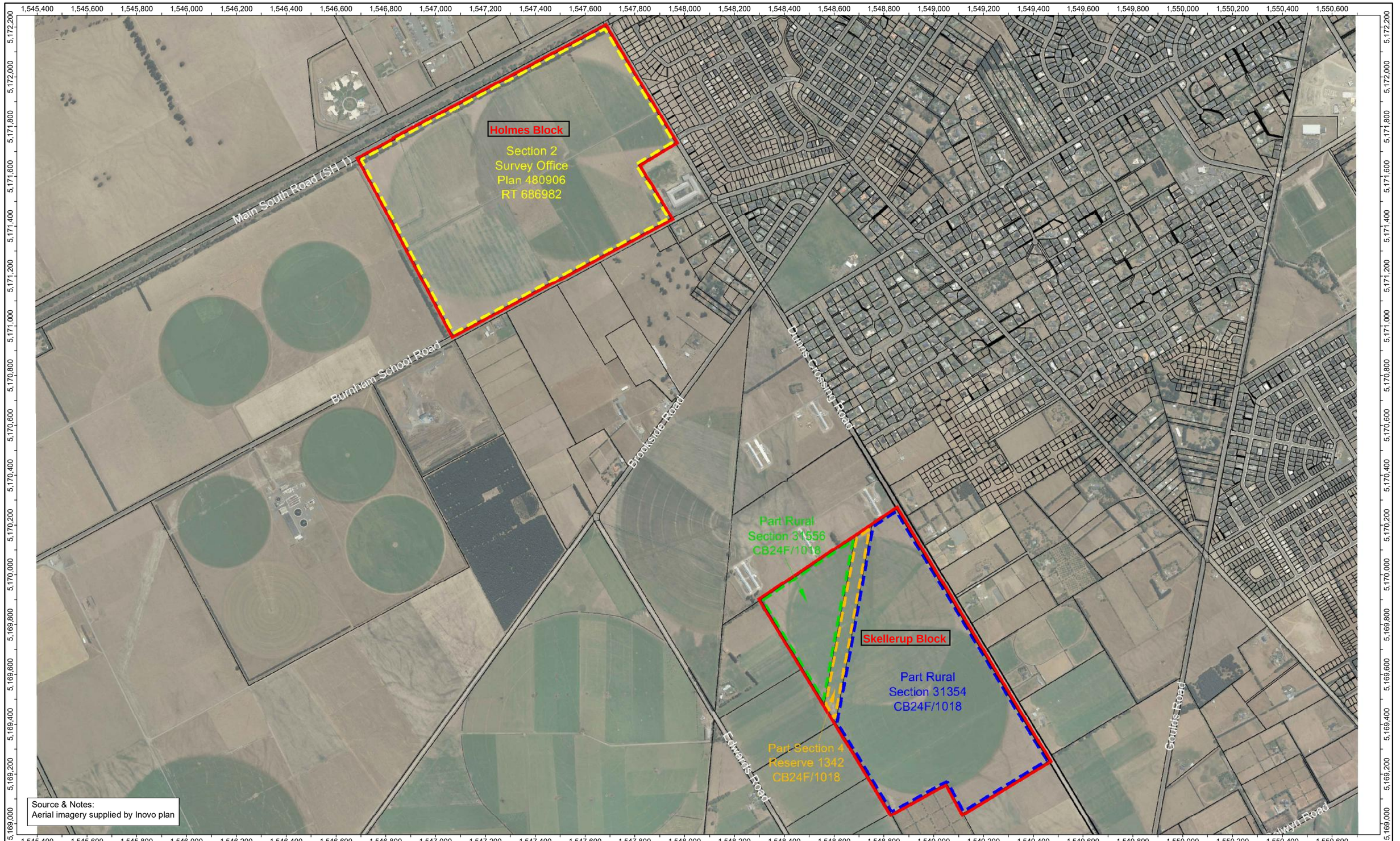
The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

Figures



revision	no.	description	drawn	approved	date
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SCALE 1:14,000 (A3) METRES

Projection: NZGD 2000 New Zealand Transverse Mercator

drawn	RZ
approved	CT
date	04.11.2020
scale	AS SHOWN
original size	A3

coffey
A TETRA TECH COMPANY

client:	ROLLESTON WEST RESIDENTIAL LTD.		
project:	ROLLESTON WEST PLAN CHANGE		
title:	SITE INVESTIGATION PLAN		
project no: 773-CHCGE281253	figure no: 01	rev: A	

MXD ref: 281253_01_GIS001_1

Appendix A – Selected historical aerial photographs

1974 Aerial Image

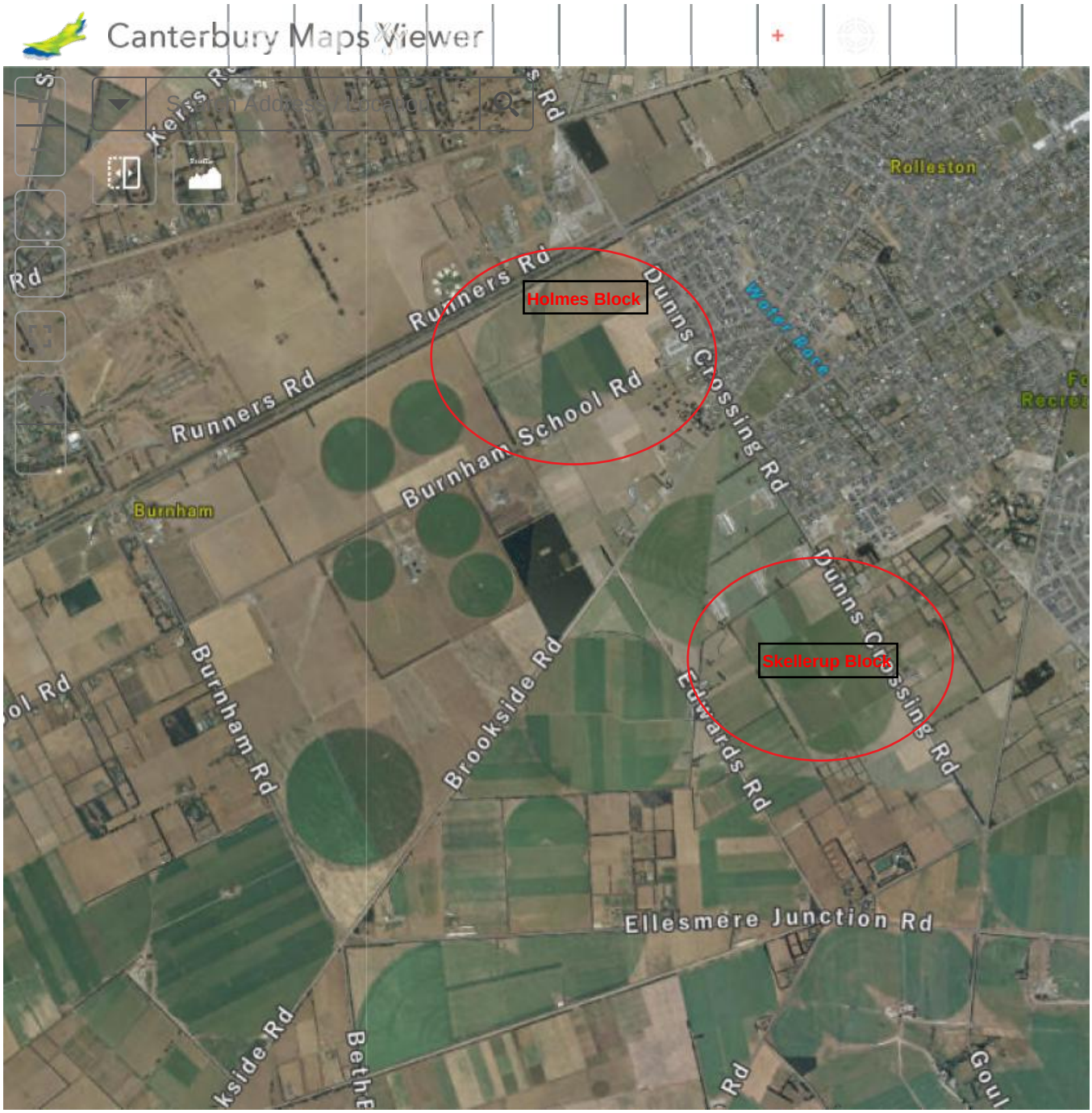
Skellerup Block

Holmes Block

SN 2713 C/5

1994 Aerial Image


2000 Aerial Image
Holmes Block
Skellerup Block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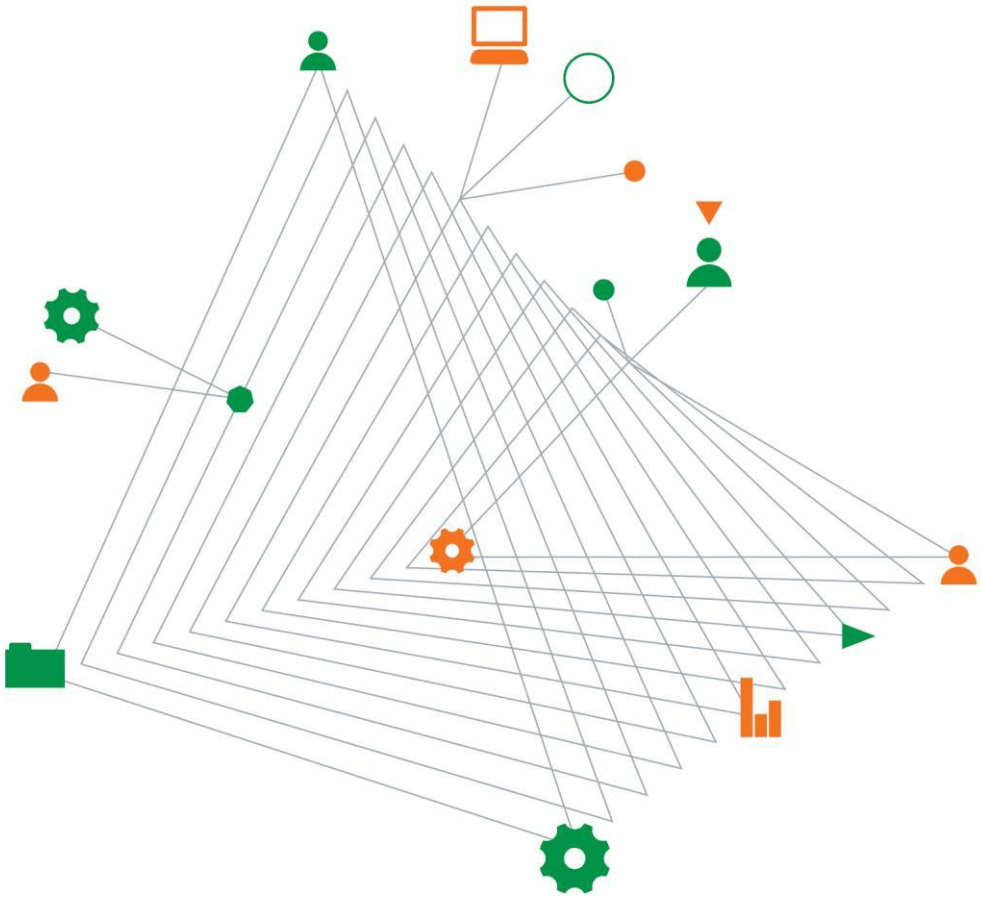
Rolleston West Residential Ltd

Rolleston West Plan Change

Preliminary Site Investigation

20 January 2021



Experience comes to life when it is powered by expertise

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Revised Final	1	PDF	Rolleston West Residential Ltd	20/01/2020

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Tables

Figures

Appendices

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The proposed Plan Change area comprises two land parcels (the "site", Figure 1) herein referred to as Holmes Block and Skellerup Block located on the western side of the Rolleston Township.

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This PSI report has been reviewed by a Suitably Qualified and Experienced Practitioner (SQEP), as required by the NES.

1.1. Objectives

The objectives of this PSI were to:

- Identify potentially contaminating (HAIL) activities or potential sources of contamination that might have occurred or exist at the site.
- Confirm the suitability of the land for subdivision and provide recommendations regarding additional works required prior to any future development.

1.2. Scope of works

The scope of work was undertaken in general accordance with the staged process defined by the Ministry for Environment (MfE) Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils (revised 2011) and the findings are presented in accordance with the MfE Contaminated Land Management Guideline No.1: Reporting on Contaminated Sites in New Zealand (revised 2011). Both the above documents are incorporated by reference into the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES).

In summary, the following scope of works was undertaken:

- Review of Environment Canterbury's Listed Land-Use Register (LLUR) for the site.
- Review of published geological maps and the Coffey database to appraise likely soil and groundwater conditions at the site.
- Review of selected publicly available aerial photographs or other accessible historical photographs.
- Site walkover, focussed on areas with structures or visible land disturbance to consider land contamination indicators (e.g. visual evidence of waste dumping/material spills, chemical storage and/or usage areas, anomalous die-back in vegetation, ground staining).

- Preparation of this PSI report. As required by the NESCS, this report was reviewed and approved by a suitably qualified and experienced practitioner (SQEP).

2. Site information

2.1. Site description

The Holmes and Skellerup Blocks are both rectangular in shape with predominately flat topography, situated approximately 2 km south-west of the central Rolleston township and approximately 24 km south-west of Christchurch's central business district. Details of the two blocks are listed in Table 1 and their locations are shown on Figure 1.

Holmes Block is bordered by agricultural land-use south-west, Main South Road north-west, Dunns Crossing Road and West Rolleston School north-east and Burnham School Road to the south-east.

Skellerup Block is bordered by agricultural land-use north-west, south-west and south-east and Dunns Crossing Road to the north-east.

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The geology of the site is shown on the Institute of Geological and Nuclear Sciences (GNS) geological map sheet 21: Christchurch, scale 1:250,000. The map indicates the site is underlain by the Burnham Formation for the Otiran Stage of the Hawera Series. The underlying geology comprises 1-3m thick stratal sets of gravel, intercalated with sand and loess-silt layers.

The nearest surface water body to the site is the Selwyn River located approximately 6 km to the south-west of the site/s. This river flows in a south-east direction eventually feeding into Lake Ellesmere approximately 13 km south-east of the site.

For further information, refer to Coffey's Geotechnical Assessment Report produced in November 2020.

2.3. Site history

The following sections summarise the historical activities undertaken within or in the immediate vicinity of the site, as determined from the information sources reviewed during this PSI.

2.3.1. Listed land-use register

Environment Canterbury's LLUR was accessed on 4 November 2020, however, it was noted that the LLUR currently has no information about HAIL sites on these land parcels (Holmes and Skellerup Block).

Two investigations were recorded within the Council records for the Holmes Block (Section 2 SO 480906), one preliminary site investigation (PSI) in 2013 and a detailed site investigation (DSI) in 2014, however, these investigations related to the West Rolleston Primary School site (corner of Dunns Crossing and Burnham School Roads), which is outside of the proposed site/s area.

2.3.2. Previous environmental investigations

Due the proximity of the investigations (PSI and DSI undertaken on the West Rolleston Primary School site) undertaken to the site, the investigation reports (for the West Rolleston Primary School site) were reviewed to assist with determining the potential risk / impacts to soil associated with agricultural activities undertaken which are similar to what has occurred on the subject site. A summary of these investigations is provided below.

PSI - Proposed Rolleston School Site

A review of the PSI (Soil and Groundwater Quality report by Separate Phase Ltd, dated 3 July 2013) was undertaken on 20 January 2021. The report noted that *"as the site was a farm and forestry block there is potential for agricultural chemical residues and polycyclic aromatic hydrocarbons (PAH) from clearance burning, to be present in soils. These concentrations are unlikely to pose a risk to human health or the environment".*

DSI - West Rolleston School

A review of the DSI (West Rolleston School Detailed Site Investigation report by GHD, dated November 2014) was undertaken on 20 January 2021. The report indicated the following:

- Inorganic heavy metal soil concentrations were below naturally occurring background levels for all samples tested.
- OCPs and PAH concentrations were below the laboratory detection limits.
- Based upon the measured contaminant concentrations observed in soil samples, it was considered that contaminants in soils were unlikely to pose a risk to human health during or after the proposed development works at the site.

In summary, based on the review of the PSI and DSI reports, the potential risk / impacts to soils associated with the activities undertaken on the site would be considered low (unlikely to pose a risk to human health).

2.3.3. Historical aerial photographs

Historical aerial photographs of the site and the surrounding area taken between 1942 and 2019 were sourced from the Local Government Geospatial Alliance's (LGGA) Retrolens and the Canterbury Maps Viewer. A summary of observations made from the review of these photographs is provided below. Copies of selected aerial photographs reviewed are included in Appendix A.

Both sites were in use as agricultural land from the initial 1942 historical aerial images with a single residential structure on the central north-western boundary of the Holmes Block, however, this is no

longer present in the 1994 historical aerial image. No structures appear on the Skellerup Block in any of the historical aerial images reviewed. Both the Holmes and Skellerup Blocks appear to have remained in use as agricultural land through all of the historical aerial images reviewed to present day.

The aerial imagery indicated that the site appears to have been used for agricultural purposes since before 1943 and may be impacted by HAIL category A10 (persistent pesticide bulk storage or use).

2.3.4. Site walkover

Coffey staff conducted a site walkover of the site on 4 November 2020. A conversation held with the current site owner and on-site observations made during the site walkover of the two properties indicated the following:

Holmes Block

- Ex forestry, converted to crops mid 2000's.
- Crops included lucerne, barley and maize.
- Some young stock grazed.
- No known offal pits or borrow areas.

Skellerup Block

- Ex forestry, converted to crops mid 2000's.
- Crops include kale.
- Some grazing and silage.
- No known offal pits or borrow areas.

No staining or significant plant die off visual evidence of chemical storage was observed on any of the properties during the site walkover.

3. Summary

Coffey was contracted by the client to conduct a PSI for the properties (Holmes and Skellerup Block) located off Dunns Crossing Road, Rolleston (the 'site', Figure 1). This investigation has been undertaken to confirm the suitability of the site for plan change and associated subdivision.

Coffey completed a review of Environment Canterbury's LLUR, published geological maps, publicly available historical aerial photographs, Investigation reports undertaken on the West Rolleston Primary School site (reviewed 20 January 2021) and completed a site walkover of the site on the 4 November 2020.

On the basis of the information reviewed and collected, Coffey has identified actual or potential HAIL activities to likely have occurred on-site as summarised in Table 2 below:

Table 2: Identified actual or potential HAIL activities

Actual/Potential HAIL Activities	Land Use	Information Source	Considered Risk Potential for Contamination to Surrounding Environment
Persistent pesticide bulk storage or use (HAIL Category A10)	Use of pesticide and other agrochemicals in agricultural activities	Site walkover observations, historical aerial photographs, and West Rolleston Primary School site investigation reports (PSI and DSI)	The risk potential to the underlying soil and groundwater is considered **low** due to: • Relatively long period of use (since prior to 1943). • Likely use of non-environmentally persistent chemicals in the paddocks. • Results of the sample analysis undertaken on the adjacent site.

The site walkover and review of site history information indicates the following key potential receptors that may be relevant to the site:

- Earthworks contractors who may come into contact with potentially contaminated soil during any proposed future development works.
- Future occupiers of the properties within the site.

4. Recommendations

Due to the likely presence of HAIL activities on the site, the NESCS regulations are considered to apply to the site. Subdividing or changing land use is a permitted activity under section 8(4)(b) of the NESCS if the report on the site states that it is highly unlikely that there will be a risk to human health if the activity is done to the piece of land.

The potential of contamination to soil associated with the identified potential sources of contamination are considered low (refer to Table 2 above), depending on the activity identified. However, it is considered unlikely that there will be a risk to human health with the proposed plan change and subdivision providing that the potential contaminant source areas listed in Table 2 are assessed.

The site is considered to be suitable for plan change and subdivision, with any consent granted for the site, conditional on a detailed site investigation (DSI) being carried out prior to any earthworks and or building consents being granted.

Coffey recommends soil characterisation samples are taken from across the site to create a detailed site investigation (DSI) prior to earthworks consent being granted to ensure elevated contaminates and excessive use of pesticides are not present.

5. Limitations

The findings of this report should be read together with “Important Information ‘About Your Coffey Environmental Report’ (attached).

6. References

Environment Canterbury's listed land-use register. https://llur.ecan.govt.nz/ (accessed 4 November 2020)

Institute of Geological and Nuclear Sciences (1992). Geological Map 1, scale 1:25,000: Geology of the Christchurch Urban Area.

MfE (2003). Contaminated Land Management Guideline No. 1: Reporting on Contaminated Sites in New Zealand. Ministry for the Environment, Wellington, New Zealand. (Revised 2011).

MfE (2004). Ministry for the Environments Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils. Ministry for the Environment, Wellington, New Zealand. (Revised 2011).

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

Important information about your **Coffey** Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

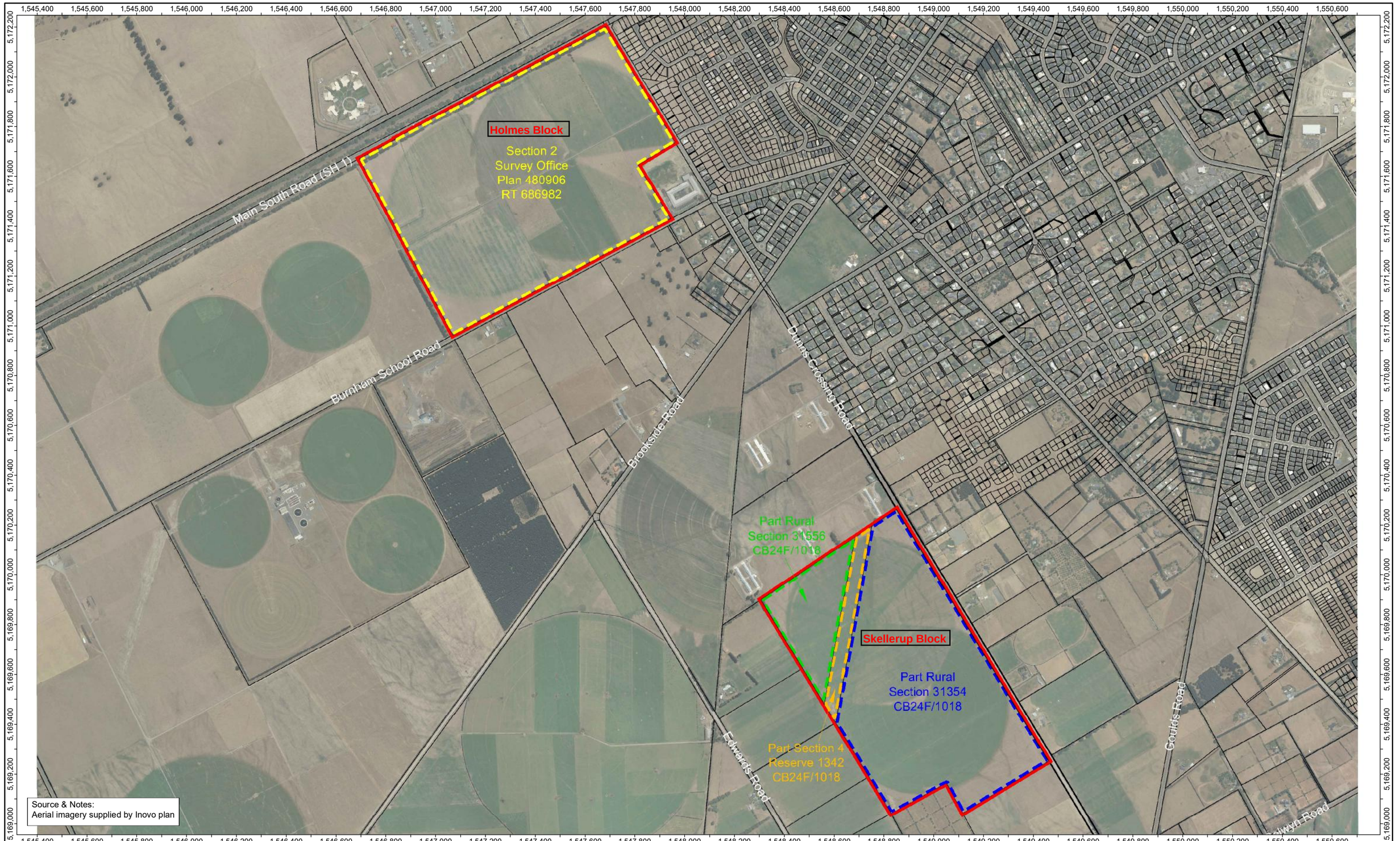
The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

Figures



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	A	ORIGINAL ISSUE	RZ	CT	04.11.20

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SCALE 1:14,000 (A3) METRES

Projection: NZGD 2000 New Zealand Transverse Mercator

drawn	RZ
approved	CT
date	04.11.2020
scale	AS SHOWN
original size	A3

coffey
A TETRA TECH COMPANY

client:	ROLLESTON WEST RESIDENTIAL LTD.		
project:	ROLLESTON WEST PLAN CHANGE		
title:	SITE INVESTIGATION PLAN		
project no: 773-CHCGE281253	figure no: 01	rev: A	

MXD ref: 281253_01_GIS001_1

Appendix A – Selected historical aerial photographs

1974 Aerial Image

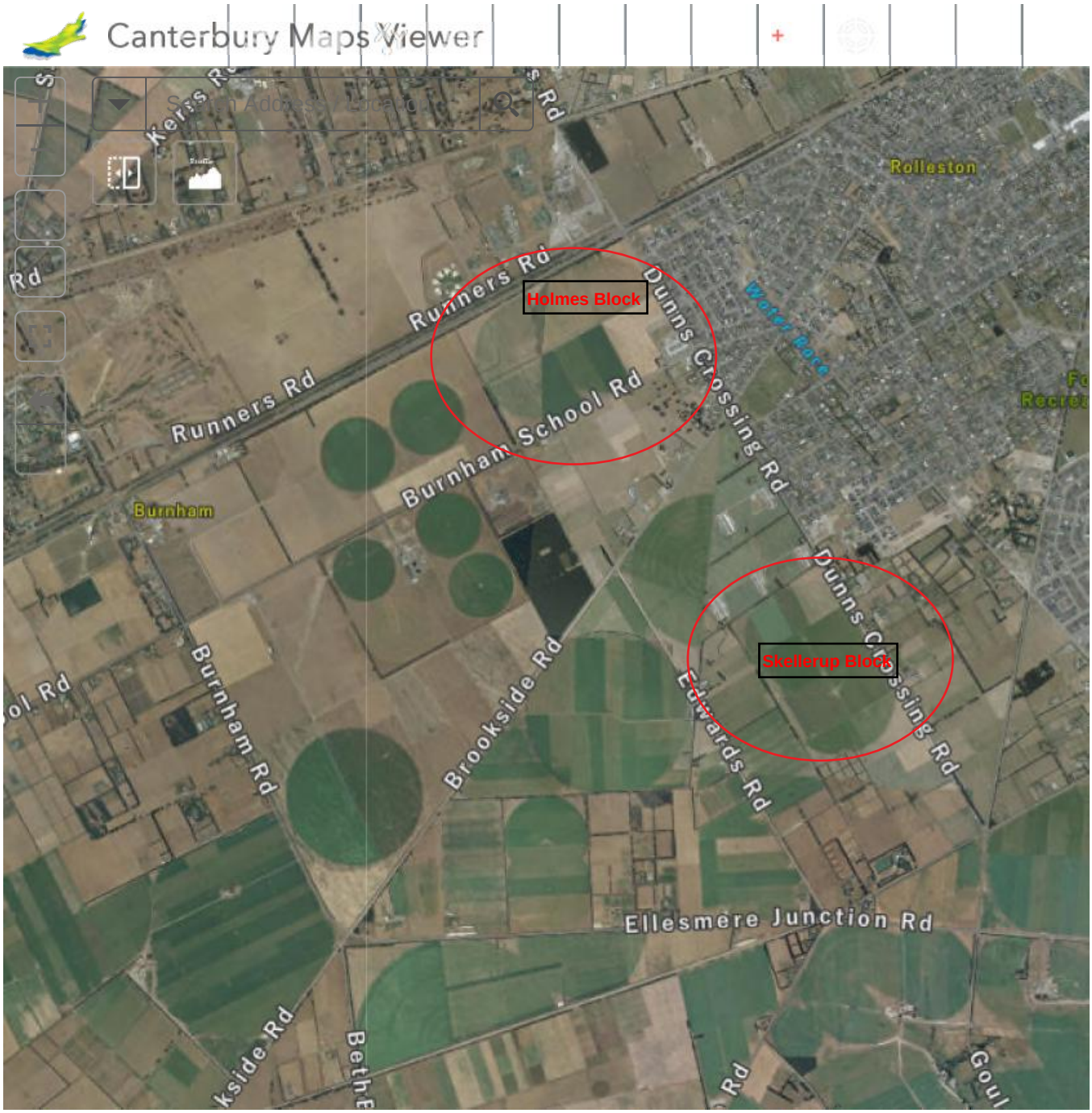
Skellerup Block

Holmes Block

SN 2713 C/5

1994 Aerial Image


2000 Aerial Image
Holmes Block
Skellerup Block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