

Investigation



545 East Maddisons Road, Rolleston

Prepared for Peter Tilling 501792

Preliminary Site Investigation

545 East Maddisons Road, Rolleston

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501792

Quality Control Certificate

Eliot Sinclair & Partners Limited

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Status:	Final		
Release date:	18 November 2020		
Reference no:	501792		
Distributed to:	Peter Tilling		

Limitations

This report has been prepared for Peter Tilling according to their instructions and for the particular objectives described in this report. The information contained in this report should not be used by anyone else or for any other purposes.



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Executive Summary

Site Address	545 East Maddisons Road, Rolleston				
Legal Description	Lot 1 DP 326339				
Site Area	4 hectares				
Local Authority	Selwyn District Council				
Owner(s)	Kerry Ivy Thompson, Peter Mark Tilling				
Proposed Activity	Change use of the piece of land				
Historical and current land uses	Former tunnel house/market garden for "flower growing" in 2014 (refer to LLUR property statement). A workshop north of the existing dwelling used as an auto electrical				
	workshop.				
Proposed land use	Re-zone the land from Rural Inner Plains to Living Z				
Current Zoning	Rural Inner Plains				
Adopted NESCS land use scenario	Rural Residential (25% produce)				
HAIL activities inferred from review of historical records	The Environment Canterbury LLUR identifies the area adjacent to the original dwelling as HAIL A10 'persistent pesticide bulk storage or use including sports turfs, market gardens, glass houses or spray sheds' HAIL F4: Motor vehicle workshops.				
	Autoelectrix Rolleston Ltd. Oil drums in the area of the existing workshop and associated minor surface staining of the ground in the immediate vicinity of the drums was observed. Minor surface staining associated with the movement of old/wrecked vehicles was also observed.				
	Due to the minor areas involved and surface impact only, we assess that there is no immediate human health risk for the existing site use. For future residential land use, we recommend that the drums are appropriately disposed of at a facility authorised to receive them, and a surface scrape of visibly impacted soil is undertaken and also disposed of at an approved facility.				
Recommendations and Conclusion	We understand following discussions with Peter Tilling that all old batteries are managed and disposed offsite by a third party "Exide Batteries".				
	The tunnel house/market garden activity (flower growing) is assessed as non-HAIL.				
	As best industry practice, it is recommended that if any unusual or contaminated materials are encountered during any future site works that the Accidental Discovery Protocol, provided below, is followed.				
	It is considered that no Detailed Site Investigation (DSI) is required and that no resource consent is required under the NESCS as the small area of potential contamination can be removed as a permitted activity.				
	Based on the above findings, the site is considered suitable for residential use and there are no constraints to the re-zoning of the site in terms of ground contamination matters.				



1. Introduction

Eliot Sinclair was engaged by Peter Tilling to undertake a Preliminary Site Investigation (PSI) of the land at 545 East Maddisons Road, Rolleston ('The site').

2. Scope of Work

The scope of this report is to prepare a PSI in accordance with MfE's Contaminated Land Management Guidelines (CLMG) No. 1 and 5, and the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health), Regulations 2011 (NESCS).

3. Site Identification

The property at 545 East Maddisons Road is legally described as Lot 1 DP 326339 and comprises an area of approximately 4 hectares.

The site is accessed from East Maddisons Road to the east. Refer to Figure 1. The site is within a Rural zone "Inner Plains". Refer to Section 5 for a detailed site description of Areas A to D.



Figure 1: Site location and layout. Aerial photography retrieved from Canterbury Maps GIS.

4. Proposed Activity

It is proposed to re-zone the land at 545 East Maddisons Road, Rolleston from Rural Inner Plains to Living Z. It is proposed that the site be included in the private Plan Change (PC64) to avoid having an isolated land parcel zoned rural in an area surrounded by residential zones and uses.



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5. Site Condition and Surrounding Environment

The site areas shown on Figure 1 are described in detail below based on a site walkover inspection on 11 November 2020.

5.1. Area A

Refer to Figure 2. Site features include:

- A relocated timber-framed single storey dwelling with weatherboard cladding and shallow timber piles,
- A single storey "versatile" dwelling with lightweight steel cladding, roof on a concrete floor slab,
- A single storey farm shed with lightweight cladding and roofing,
- Container storage shed,
- Former market garden and tunnel house area,
- Redundant water retention pond.



Figure 2: Area A features. Aerial photography retrieved from Canterbury Maps GIS

5.2. Area B

Refer to Figure 3. Features include;

- An industrial building with an intact concrete floor specialising in vehicle electrics and car batteries,
- Compacted gravel driveway and surround,
- Oil drums (~5 observed),
- Dis-used vehicles.



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Figure 3: Area B Aerial photography retrieved from Canterbury Maps GIS

5.3. Area C

Refer to Figure 4. Area C is currently used for the storage of various earthworks plant, machinery and portacom buildings. Drainage materials, manhole sections and concrete blocks were also observed during the site walkover inspection. A backfilled offal pit is located in the western corner of Area C. No HAIL activities identified.



Figure 4: Area C. Photograph taken on 11 November 2020.



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5.4. Area D

Refer to Figure 5. Site features at time of the walkover inspection included:

- An excavated pit that the site owner advised was to replace the former offal pit located in the western corner of the site (within Area C),
- Undulating farmland used for grazing,
- Livestock pen for calves,
- Woodshed,
- Former organic stockpile areas (tree branches).

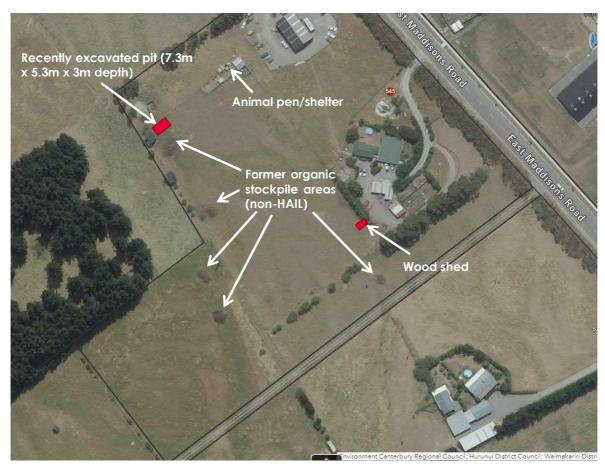


Figure 5: Area D site features. Aerial photography retrieved from Canterbury Maps GIS.

5.5. Geology and groundwater

Bore log records from the Environment Canterbury (ECan) GIS system were reviewed to determine typical subsoil geology of the general area.

Well M36/7648, located in the middle of the northeast end of the site encountered 'small to medium' and 'silt bound gravels' to 26m depth where the well terminated. Initial groundwater was at 8m below ground level (bgl) in May 2004.

Well M36/7512, located 60m south of the site encountered 'sandy gravel' to 12.6m, over 'silt bound gravels' and 'small to medium gravels' to 29m depth where the well terminated. Initial groundwater was at 8m bgl in December 2003.



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Well M36/7543, located 200m northeast of the northeast boundary of the site encountered topsoil to 0.4mm over 'sandy gravel' to 6.8m, over 'small to medium gravels' with clay and silts to 26m depth where the well terminated. Initial ground water was at 7.7m bgl in May 2004.

Well M36/4891, located 290m northwest of the site encountered 'Claywashed gravel' and 'brown stained gravel' to 12.8m, over 'Water bearing gravel' to 27m depth where the well terminated. Initial ground water was at 7.4m bgl in May 1995.

Well M36/7902, located 290m south of the site encountered 'sandy gravels' and 'claybound gravels' to 198m, over 'sandy gravels' to 28m, over 'clay' to 28.5m, over 'sandy gravels' to 36m depth where the well terminated. Initial ground water was at 8.4m bgl in August 2005.

Refer to Appendix A for ECan's borehole logs.

5.6. Summary

The environmental setting of the site is summarised in Table 1.

Table 1: Environmental Setting

Site Address	545 East Maddisons Road, Rolleston
Geology	Unweathered, brownish grey, variable mix of gravels/sand/silt/clay in low river terraces.
Surface Water	No surface water was present on or near the site at time of the investigation.
Topography	The site is generally flat with shallow undulations.
Vegetation	The site is generally grassed paddocks.

6. Site History

Information held on the Environment Canterbury (ECan) Listed Land Use Register (LLUR), Selwyn District Council (SDC) property file, resource consents on the ECan GIS and historical aerial photographs were reviewed, along with a site walkover to assess the likelihood of any historical or current HAIL activities. A summary is provided in Table 2.

Table 2: Summary of Potential HAIL Activities

Comments – Potential HAIL Activities		
Listed as A10 – Persistent pesticide bulk storage or use		
Existing shed consented as an industrial building (AutoElectrix)		
No HAIL activities identified.		
HAIL F4: Workshop		
HAIL A10: Tunnel house		
HAIL F4: Workshop		
We understand following discussions with Peter Tilling that all old batteries are managed and disposed offsite by a third party "Exide Batteries".		



6.1. Environment Canterbury Listed Land Use Register

A review of the ECan LLUR has been undertaken. The LLUR is a database containing records of contaminated, potentially contaminated and remediated (previously contaminated) sites in Canterbury. It is not an exhaustive database, i.e. an unregistered site does not confirm that there have never been any HAIL activities undertaken on the site.

An inferred market garden is listed on the LLUR as HAIL A10 'persistent pesticide bulk storage or use including sports turfs, market gardens, glass houses or spray sheds'. Refer to Figure 6.



Figure 6: LLUR Property Statement excerpt

7. Selwyn District Council

We have requested and received the property file for 545 East Maddisons Road to identify any current or previous HAIL activities.

The building in Area B has been consented to operate as a workshop, which is currently operating as Autoelectrix Rolleston Ltd (HAIL F4).

No other HAIL activities were identified.

8. ECan Resource Consent Database

The ECan Resource Consent Database was reviewed to determine if there are any discharge consents, or if bulk storage of hazardous materials were recorded for the site, as these activities can present a risk of ground contamination.

Resource Consent (CRC041743) was issued in March 2004 and expired in March 2007. The consent relates to the installation of "one bore for domestic and stockwater purposes".

No HAIL activities were identified.



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9. Historical Aerial Images

Historical aerial photographs were reviewed from the Canterbury Maps website¹, which includes images from Land Information New Zealand, ECan and New Zealand Aerial Mapping, along with recent aerial photography shown on Google Earth Pro. Refer to Appendix B.

Table 3: Aerial Review Summary

Image date	Comments
1940-1944	Paddocks with shallow undulations across the site
1960-1964	No significant change
1970-1974	No significant change
1980-1984	No significant change
1990-1994	No significant change
2000-2004	No significant change
2010-2015	Area A: Structures now present, including the tunnel house (refer to Section 5).
	Area B: Still vacant
	Area C: Ground disturbance associated with the now backfilled offal pit is visible in the northwestern corner of the site.
	Area D: Animal pens/shelters now present.
2019	Areas A and D: No significant change
	Area B: Industrial workshop now present with dis-used vehicles and vehicle parts visible.
	Area C: Ground disturbance/excavated pit in northwestern corner measured in Canterbury Maps to be approximately 4m x 5m.
Summary	The excavation pit evident in the 2019 aerial photograph was backfilled at the time of inspection in November 2020.
	HAIL F4 confirmed.
	No other HAIL activities were obvious in the available photography.

10. Site Walkover Inspection

A site walkover was undertaken on 11 November 2020 with the current landowner, Peter Tilling. The following was noted:

The site comprised of the areas as described in Section 5. Specific reference is made to the following items:

- Area A: The market garden identified was previously used to grow flowers. At the time of investigation in November 2020 this area is generally vegetated with long grass and weeds. Two surface samples were screened within this area using the portable XRF analyser for priority contaminants, including arsenic and lead. Results were all below the NESCS rural-residential guidelines criteria,
- Area B: The structure is currently used as an auto-electric workshop (Autoelectrix Rolleston Ltd). The workshop comprises an intact concrete floor slab. New batteries, vehicle parts, tools, lubricants and oils are stored within the workshop.

¹ https://mapviewer.canterburymaps.govt.nz/



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- Area B: The area surrounding the building is unpaved. Dis-used drums (lubricants) were identified adjacent to the workshop, including one that is utilised for waste oil. Minor surface staining was observed in this area. Dis-used vehicles and parts were sighted adjacent to the western side of the workshop,
- Area C: The excavated pit evident in the 2019 aerial photography (offal pit) has been backfilled and at the time of investigation in November 2020 concrete blocks were stored in the area of the former pit.
- Area D: An excavated pit (~3m deep) was identified, as shown on Figure 5. The pit comprised a minor volume of burnt materials in the base. Gravel, branches and a single steel drum and wire was observed. Three representative soil samples were screened using a portable XRF analyser for priority contaminants, including arsenic and lead. Samples were obtained at the surface of the pit within visibly burnt soil and depths of 1m and 2.7m. Results were compared to the NESCS rural-residential guideline criteria. Results were all below NESCS rural-residential guidelines criteria as summarised below;
 - i) Arsenic reported range between 3.3 and 13.1 mg/kg (NESCS guideline criteria of 17mg/kg),
 - ii) Lead reported range between 14.2 and 18.2 mg/kg (NESCS guideline criteria of 160mg/kg),
- Area D: Former stockpile areas were sighted across the paddock and appear to be organic (non-HAIL).

Refer to Appendix C for representative site photographs and Appendix D for the XRF analysis records.

11. Owner Interview

We have undertaken a site walkover with the current landowner, Peter Tilling who had owned the property for over 18 years, and Peter advised the following.

- All old batteries are temporarily stored in the workshop for pick up by "Exide Batteries" for recycling,
- Minor servicing works such as oil changes has been carried out at the workshop,
- Waste oil contained within a drum adjacent to the workshop is used to fuel a portable fire burner to heat the workshop during the cold winter period,
- The former pit is an offal pit evident in the 2019 aerial photograph.
- The recently excavated pit was used to burn off trees and is largely organic,
- The market garden area was previously used to grow flowers, no pesticides were used: the garden was fertilised with worm feed,
- The sheds in Area A are used for general storage and farm equipment,
- Raised garden beds adjacent to the original dwelling is for domestic use,
- The pond feature was a project previously undertaken by Peter Tilling to act as a water retention pond. This project is currently abandoned.

The owner was not aware of any HAIL activities having taken place on the site.

12. Conceptual Site Model

A conceptual site model helps to identify whether or not a complete exposure pathway exists. An exposure pathway must include a contaminant source, a transport mechanism and a receptor. If one of these components does not exist, or can be removed, then the exposure pathway is incomplete. If the exposure pathway is incomplete, then there is little risk to human health at the specified location.



At time of investigation in November 2020, oil drums and dis-used vehicles were identified within the area of the workshop. Vehicle oils, fuel, and lubricants act as a potential contaminant source. Pathways for human exposure include dermal contact, inhalation, and ingestion of small amounts of soil or liquids. The potential receptors are existing and future site occupiers, and the surrounding environment.

13. Recommendations and Conclusions

This PSI is based on a review of Council records, Environment Canterbury records, historical images, owner interview and Eliot Sinclair's site walkover inspection on 11 November 2020.

We have identified one existing HAIL activity (F4), associated with Autoelectrix Rolleston Ltd. Oil drums in the area of the existing workshop and associated minor surface staining of the ground in the immediate vicinity of the drums was observed. Minor surface staining associated with the movement of dis-used vehicles was also observed.

Due to the minor areas involved and surface impact only, we assess that there is no immediate human health risk for the existing site use. For future residential land use, we recommend that the drums are appropriately disposed of at a facility authorised to receive them, and a surface scrape of visibly impacted soil is undertaken and also disposed of at an approved facility. The volume of soil requiring disposal is not likely to exceed the permitted activity criteria specified in the NES, which states:

Regulation 8(3) allows for relatively small-scale soil disturbance that may occur on land that is not associated with either soil sampling or removing or replacing fuel systems.

The NES requires:

- a. that controls be put in place to minimise people's contact with the soil during the disturbance works – including the people undertaking the disturbance works and any people on neighbouring properties who might come into contact with contaminants moving off-site (for example, in dust or water)
- b. that the soil be reinstated to an erosion resistant state within one month of completing the sampling or subsurface works
- c. that, if there is a structure in place designed to contain contaminants, then the integrity of the structure must not be compromised
- d. disposal of removed soil at a facility authorised to receive such waste

and sets limits on the:

- e. volume of soil disturbance (no more than 25 m³ (in-situ volume) per 500 m² of land)
- f. volume of soil removed (up to a total limit of 5 m^3 (in-situ volume) per 500 m^2 of land per year, not including soil removed as samples for laboratory analysis) provided that the soil is disposed of at a facility authorised to receive such material
- g. duration of the soil disturbance (no longer than 2 months).

We understand following discussions with Peter Tilling that all old batteries are managed and disposed offsite by a third party "Exide Batteries".

The former market garden activity (flower growing) is assessed as non-HAIL.

As best industry practice, it is recommended that if any unusual or contaminated materials are encountered during any future site works that the Accidental Discovery Protocol, provided below, is followed.



It is considered that a Detailed Site Investigation (DSI) is not required and that no resource consent is required under the NESCS as the small area of potential contamination can be removed as a permitted activity.

Based on the above findings, the site is considered suitable for residential use and there are no constraints to the proposed re-zoning.

Accidental Discovery of Contamination

If any of the following materials are encountered during any future earthworks, such as:

- Stained or odorous soil (e.g. black, green, grey; or smells of rotting organic material, petroleum hydrocarbons or solvents)
- Slag, ash, charcoal
- Rubbish comprising putrescible waste, or hardfill, or treated timber, or agrichemicals, etc
- Potential asbestos containing-material (for example fragments from cement fibre sheets, or loose fibres from insulation, etc.)

Then we recommend:

- Excavation and earthworks cease, the site secured to stop people entering the area where potential contamination was encountered, and then:
- Contact a contaminated land specialist for further advice. If required, Eliot Sinclair (03) 379 4014 can inspect the area, assess the material determine if it is contaminated or hazardous, and then determine a practical course of action.

This report does not relieve contractors and landowners of their responsibilities under the Health and Safety at Work Act 2015.

15. Limitations

Preliminary Site Investigation

The comments made in this report are based on a desktop review, site walkover inspection on 11 November 2020 and discussions with the current site owner. It is possible these may not provide a complete or accurate assessment of the entire site. As a result, Eliot Sinclair provides this information on the basis that it does not guarantee that the information is complete or without error and accepts no liability for any inaccuracy in, or omission from, this information.

All reasonable effort has been made to ensure that the conclusions drawn in this report are correct at the time of reporting. However, the activities described on the HAIL may change in the future as knowledge about potentially hazardous activities develops over time.

It is possible there may be unidentified subsoil conditions that are not obvious from the information obtained by our investigations and site inspection, and that differ from the conclusions of this report. Should unusual geotechnical conditions be encountered during future earthworks such as historical uncontrolled fill materials, then Eliot Sinclair should be advised. They can review any new information and to advise if the recommendations of this report are still valid.

This report has been prepared for the benefit of Peter Tilling. No liability is accepted by this company or any employee of this company with respect to the use of this report by any other party or for any other purpose other than what is stated in our scope of work.

This report does not relieve contractors of their responsibilities under the Health and Safety at Work Act 2015. Site conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes, at their own expense.



Appendix A. ECan Borehole Logs



Preliminary Site Investigation

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Bore or Well No	M36/7902
Well Name	SELWYN ROAD
Owner	RB & BM CHAPMAN & HAMILTON



Well Number	M36/7902	File Number	CO6C/23254
Owner	RB & BM CHAPMAN & HAMILTON	Well Status	Active (exist, present)
Street/Road	SELWYN ROAD	NZTM Grid Reference	BX23:50407-69271
Locality	SPRINGSTON	NZTM X and Y	1550407 - 5169271
Location Description		Location Accuracy	10 - 50m
CWMS Zone	Selwyn - Waihora	Use	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	
Depth	36.00m	Water Level Count	0
Diameter	150mm	Initial Water Level	8.40m below MP
Measuring Point Description	ТоС	Highest Water Level	
Measuring Point Elevation	35.00m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 2.5 m	First reading	
Ground Level	0.30m below MP	Last reading	
Strata Layers	6	Calc Min 80%	9.20m below MP (Estimated)
Aquifer Name		Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	1
Drill Date	09 Aug 2005	Max Tested Yield	4 l/s
Driller	East Coast Drilling	Drawdown at Max Tested Yield	16 m
Drilling Method	Rotary Rig	Specific Capacity	0.23 l/s/m
Casing Material	Steel	Last Updated	08 Nov 2013
Pump Type		Last Field Check	
Water Use Data	No		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	34.5	36				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
09 Aug 2005	1	3.7	48.83328	15.8	8

No comments for this well

Borelog for well M36/7902

Grid Reference (NZTM): 1550408 mE, 5169271 mN

Location Accuracy: 10 - 50m

Ground Level Altitude: 34.7 m +MSD Accuracy: < 2.5 m

Driller: East Coast Drilling Drill Method: Rotary Rig

Borelog Depth: 36.0 m Drill Date: 09-Aug-2005



Scale(m)	Water Level	Depth(m)		Full Drillers Description	Formation Code
		1.00m		Earth	
П			0:0::0::	sandy gravels	
Н			0:0:0:		
Н		3.00m	222022	claybound gravels	
Ц			000000	daybound gravers	
5			000000		
			000000		
П			000000		
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		_	0::0::0::	sandy gravels, some clay	
			0::0::0		
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H		28.00m _ 28.50m	<u>. 0 o . o</u>	clay	
Н			<u>0:.0::</u> 0::	sandy gravels, water	
30			:0::0::0:		
			D:: 0::0:::0		
П			10:0:0:		
Н			b::o::o::d		
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		36.00m			

Bore or Well No	M36/4891
Well Name	CNR MADDISONS & GOULDS ROAD
Owner	Mr & Ms B N & J A Stevens & Gray



Well Number	M36/4891	File Number	CO6C/06015
Owner	Mr & Ms B N & J A Stevens & Gray	Well Status	Active (exist, present)
Street/Road	CNR MADDISONS & GOULDS ROAD	NZTM Grid Reference	BX23:50117-70000
Locality	ROLLESTON	NZTM X and Y	1550117 - 5170000
Location Description		Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	
Depth	25.25m	Water Level Count	0
Diameter	150mm	Initial Water Level	7.38m below MP
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	39.15m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 2.5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	6	Calc Min 80%	9.81m below MP (Estimated)
Aquifer Name	Riccarton Gravel	Aquifer Tests	0
Aquifer Type	Unknown	Yield Drawdown Tests	1
Drill Date	05 May 1995	Max Tested Yield	8 l/s
Driller	Clemence Drilling Contractors	Drawdown at Max Tested Yield	4 m
Drilling Method	Unknown	Specific Capacity	2.25 l/s/m
Casing Material	UNKNOWN	Last Updated	08 Nov 2013
Pump Type	Unknown	Last Field Check	
Water Use Data	No		

Borelog for well M36/4891

Grid Reference (NZTM): 1550118 mE, 5170001 mN

Location Accuracy: 50 - 300m

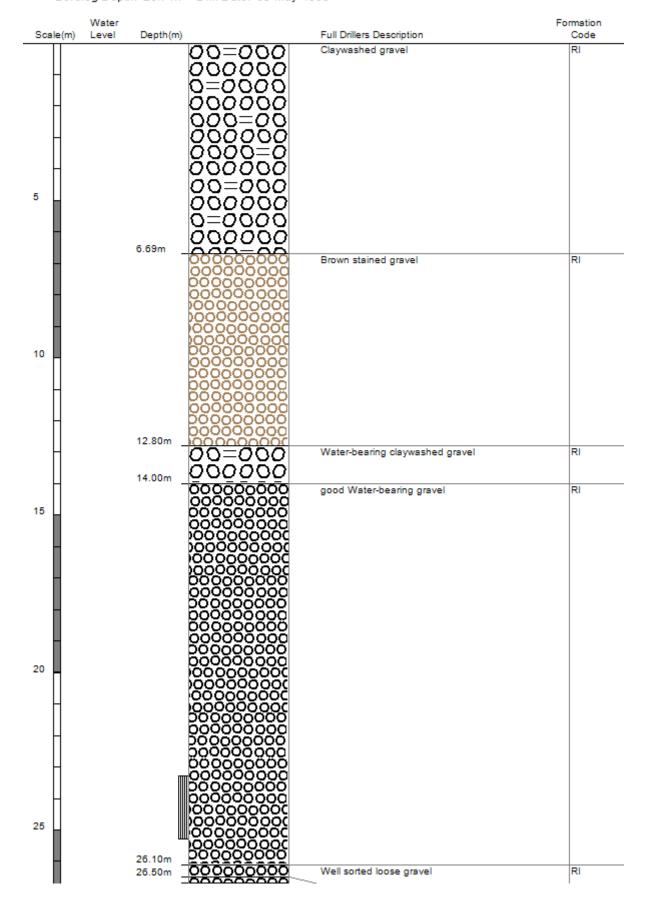
Ground Level Altitude: 39.2 m +MSD Accuracy: < 2.5 m

Driller: Clemence Drilling Contractors

Drill Method: Unknown

Borelog Depth: 26.7 m Drill Date: 05-May-1995





Bore or Well No	M36/7512
Well Name	East Maddisons Road
Owner	Mr & Mrs A S & M M Baxter



'			
Well Number	M36/7512	File Number	CO6C/21054
Owner	Mr & Mrs A S & M M Baxter	Well Status	Active (exist, present)
Street/Road	East Maddisons Road	NZTM Grid Reference	BX23:50237-69431
Locality	Rolleston	NZTM X and Y	1550237 - 5169431
Location Description		Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	
Depth	29.00m	Water Level Count	0
Diameter	150mm	Initial Water Level	8.10m below MP
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	34.85m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	6	Calc Min 80%	9.32m below MP (Estimated)
Aquifer Name		Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	2
Drill Date	01 Dec 2003	Max Tested Yield	5 l/s
Driller	Dynes Road Drilling	Drawdown at Max Tested Yield	10 m
Drilling Method	Cable Tool	Specific Capacity	0.41 l/s/m
Casing Material	STEEL	Last Updated	08 Nov 2013
Pump Type		Last Field Check	
Water Use Data	No		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	27	29				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
01 Dec 2003	1	1.5	19.7972755	3.65	2
01 Dec 2003	2	4.9	64.6711044	10.36	3

No comments for this well

Borelog for well M36/7512

Grid Reference (NZTM): 1550238 mE, 5169431 mN

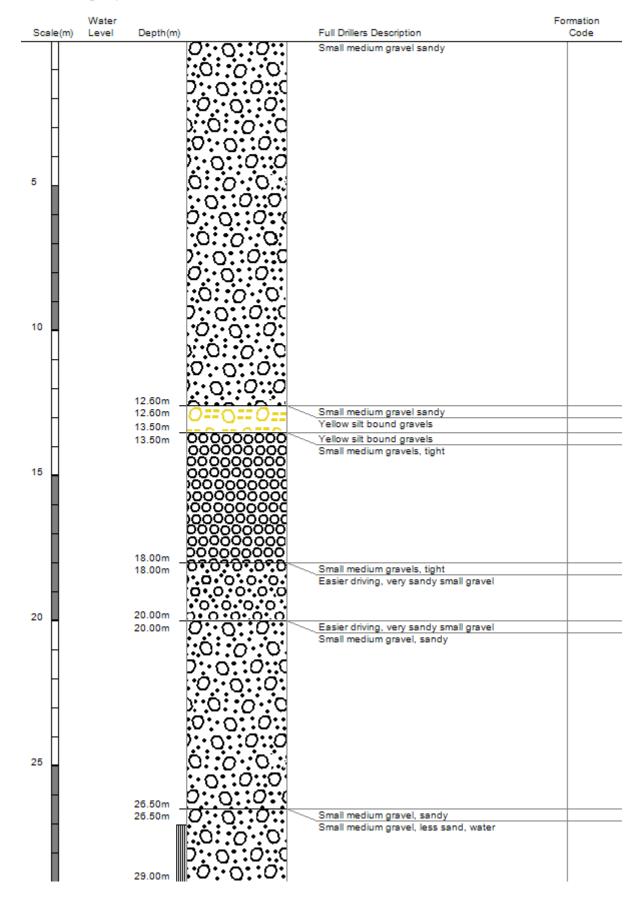
Location Accuracy: 50 - 300m

Ground Level Altitude: 34.9 m +MSD Accuracy: < 0.5 m

Driller: Dynes Road Drilling Drill Method: Cable Tool

Borelog Depth: 29.0 m Drill Date: 01-Dec-2003





Bore or Well No	M36/7543
Well Name	East Maddison Road
Owner	Mr & Ms G K & P R Poole & Eastmond



Well Number	M36/7543	File Number	CO6C/21175
Owner	Mr & Ms G K & P R Poole & Eastmond	Well Status	Active (exist, present)
Street/Road	East Maddison Road	NZTM Grid Reference	BX23:50607-69770
Locality	Rolleston	NZTM X and Y	1550607 - 5169770
Location Description		Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	
Depth	26.00m	Water Level Count	0
Diameter	150mm	Initial Water Level	7.70m below MP
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	35.63m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	7	Calc Min 80%	9.66m below MP (Estimated)
Aquifer Name	Riccarton Gravel	Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	1
Drill Date	03 May 2004	Max Tested Yield	3 l/s
Driller	Dynes Road Drilling	Drawdown at Max Tested Yield	9 m
Drilling Method	Cable Tool	Specific Capacity	0.37 l/s/m
Casing Material	Steel	Last Updated	08 Nov 2013
Pump Type		Last Field Check	
Water Use Data	No		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	24	26				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
03 May 2004	1	3.417	45.0981941	9.144	2

No comments for this well

Borelog for well M36/7543

Grid Reference (NZTM): 1550608 mE, 5169771 mN

Location Accuracy: 50 - 300m

Ground Level Altitude: 35.6 m +MSD Accuracy: < 0.5 m

Driller: Dynes Road Drilling Drill Method: Cable Tool

Borelog Depth: 26.0 m Drill Date: 03-May-2004



Scale(m)	Water Level	Depth(m)		Full Drillers Description	Formation Code
11	2070	0.40m	6767676	Brown topsoil	RI
		0.40m	0:0::0::	Brown topsoil	RI
Н			0.00	Small - medium sandy gravel	RI
- 11			h		
Н			P. 0 0		
- 11					
Н			p::0::0::a		
- 11			10::0::0::		
Н			1.0.0.d		
- 11					
5			0.0.0		
			[.0::0::0]		
н			$D:\mathcal{O}:O:A$		
- 1		6.80m	0:0:0:		
Н		6.80m	0==0==0==	Small - medium sandy gravel	RI
- 1			==0==0	Small - medium gravel some silt	RI
н					
- 1			0==0==0==		
н			# 0 # 0 # 0		
			0==0==0==		
10			=0==0==0		
			0==0==0==		
Н			=0=0=0		
- 11		11.40m _ 11.40m	 	Small - medium gravel some silt	RI
Н		11.40111	000000	Small - medium gravel with clay	RI
			000000		
Ц					
			000000		
Ц			000000		
- 11					
15			000000		
			202220		
Ш			000000		
- 1			000000		
			000000		
			000000		
			000000		
			000000		
20		20.00m	<u> </u>		
П		20.00m		Small - medium gravel with clay	RI
		21.00m		Silt water coming into well	RI
П		21.00m	0==0==0==	Silt water coming into well	RI
			F=0==0	Stained gravel in wet silt	RI
П		22.50m	0=0=0		
		22.50m	0==0==0==	Stained gravel in wet silt	RI
Н			=0=0=0	Firmer silt water dropping away a little. 23m water coming back small -	RI
			[0]=0=0=0=0=0=0=0=0=0=0=0=0=0=0=0=0=0=0=	medium gravel stained.	
Н		M			
25			525050		
20			UUU		
		26.00m			
-		20.00111	"~ ~ ·		I

Bore or Well No	M36/7648
Well Name	East Maddisons Road
Owner	Mr & Ms PM & KI Tilling & Thompson



Well Number	M36/7648	File Number	CO6C/21547
Owner	Mr & Ms PM & KI Tilling & Thompson	Well Status	Active (exist, present)
Street/Road	East Maddisons Road	NZTM Grid Reference	BX23:50377-69690
Locality	Rolleston	NZTM X and Y	1550377 - 5169690
Location Description		Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	
Depth	26.00m	Water Level Count	0
Diameter	150mm	Initial Water Level	8.10m below MP
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	35.66m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	7	Calc Min 80%	9.57m below MP (Estimated)
Aquifer Name		Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	2
Drill Date	15 May 2004	Max Tested Yield	8 l/s
Driller	Dynes Road Drilling	Drawdown at Max Tested Yield	4 m
Drilling Method	Cable Tool	Specific Capacity	2.24 l/s/m
Casing Material	STEEL	Last Updated	08 Nov 2013
Pump Type		Last Field Check	
Water Use Data	No		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	24	26				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
15 May 2004	1	3.4	44.8738251	1.52	3
15 May 2004	2	8.33	109.940872	3.96	4

No comments for this well

Borelog for well M36/7648

Grid Reference (NZTM): 1550378 mE, 5169691 mN

Location Accuracy: 50 - 300m

Ground Level Altitude: 35.7 m +MSD Accuracy: < 0.5 m

Driller: Dynes Road Drilling Drill Method: Cable Tool

Borelog Depth: 26.0 m Drill Date: 15-May-2004



Scale(m)	Water Level	Depth(m)		Full Drillers Description	Formation Code
		1.00m	000000000 000000000 000000000	small-medium gravel	
Н		1.00m _	0==0==0==	_ small-medium gravel	
- 11		1.00111		small-medium gravel - silt bound	
Н			==0==0	•	
- 11			0==0==0==		
Ц			=0=0=0		
- 11			o≕ດ≕o≕		
Ш		4.00	- 🛥		
П		4.20m _ 4.20m	00000000	_ small-medium gravel - silt bound	
5			100000000a	small-medium gravel - stained	
			000000000		
			1000000000		
н			5000000000		
			0000000000		
Н					
			000000000		
Н			00000000		
			D00000000 D0000000		
Щ			000000000		
			00000000		
10			000000000		
П			IOOOOOOOO		
- 11			000000000		
П		11.50m	000000000000000000000000000000000000000		
		11.50m	0==0==0==	_small-medium gravel - stained	
П			=0=0=0	small-medium gravel - silt bound	
			1 = = = =1		
Н			0=0=0=		
			=0=0=0		
Н		14.50m	0==0==0==		
		14.50m _	<u> </u>	_ small-medium gravel - silt bound	
15			loooooooa	small-medium gravel - stained - water	
			00000000		
H			000000000		
			000000000		
Щ			[000000000		
)000000000 D0000000		
Ш		18.00m	000000000		
		18.00m		small-medium gravel - stained - water silt bound, tight driving, no water	
Ш				sit bound, tight driving, no water	
- 1		19.50m			
20		19.50m	0:.0::0::	silt bound, tight driving, no water	
П				small-medium gravel, sandy - water keeping up	
- 11			hi a did	reehing up	
Н			F		
- 11					
Н			D::0::0::d		
			0.00.00		
Н			15.65.65.6		
Н		m	0::0:0::0		
			1:0::0::01		
25			0::0::0		
		26.00m			

Appendix B. Historical Aerial Photography



Preliminary Site Investigation

















Appendix C. Representative Site Photos



Preliminary Site Investigation

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workshop



3.Old vehicles and parts adjacent to workshop



4. BG Contracting yard. Compaction plant, equipment and parts



5. Concrete blocks in the area of the previously filled offal pit



6. Excavated burn pit.



7. Former organic stockpile area



8. Woodshed



9. Former flower growing area



10. Raised garden bed adjacent to original dwelling.



11. Workshop – new battery storage



12. Old batteries stored awaiting pick up by "Exide Batteries"

Appendix D. XRF Analysis Records



Preliminary Site Investigation

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Location Reference:	cation Reference: Area A		Area D	Area D	Area D	
Sample Name:	MG1	MG2	BP1	BP2	BP3	
Sample Date:	11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/11/2020	
Depth:	Surface	Surface	Surface	1m bgl	2.7m bgl	
				Soil, some	Soil, some	
Soil Type	Soil	Soil	Soil	gravel	gravel	
XRF Reference No:	Market Garden 1	Market Garden 2	Burn Pad 1	Burn Pad 2	Burn Pad 3	

Job Number: 501792

NES SCS Rural Residential 25% Criteria

Arsenic	17 (As)	3.2	9.2	3.3	13.1	9.6
Copper	NL (Cu)	51.7	23.1	12.1	17	21.1
Lead	160 (Pb)	14.8	12.3	18.2	15.5	14.2