Land Information Memorandum L261193

Application

Saunders Robinson Brown
Saunders Robinson Brown
PO Box 166
Rangiora 7440

No. L261193
Application date 18/05/2026
Issue date 20/05/2026
Phone 033774470

Property

Valuation No.	2405513660
Location	572 Selwyn Road
Legal Description	Lot 2002 DP 600834
Owner	Broadfield Grange Limited
Area (hectares)	2.0663

Rates

Rateable Value

The date of Selwyn's last General Revaluation was 1/09/24. For further information please contact Council's Rates Department.

Revaluation Year 2024

Land	$3,000,000.00
Improvements	$0.00
Capital Value	$3,000,000.00

Current Rates Year 2025 to 2026

Annual Rates	$6,271.95
Current Instalment	$1,321.60
Current Year - Outstanding Rates	$1,321.60
Arrears for Previous Years	$0.00
Next Instalment Due	15/06/2026

Next Revaluation Due 2027

The rates listed for this property are correct as at the date of this report being issued.

If this property is vacant land, and the applicant intends building a house or making other improvements, additional rates and charges will be added. Such rates and charges are for the operation of the District libraries, local community centre and recreation reserves, sewerage and water systems and refuse collections and recycling.

If a ratepayer in the district purchases additional properties, that ratepayer maybe eligible for certain rating exemptions due to multiple ownership. The exemptions would only apply to uniform library charges on bare land blocks and an exemption from the uniform annual general charge if contiguous or same use land is purchased.

Please contact the Councils rates team if you require clarification on 0800 SELWYN (735 996).

Note: Rates are charged in four equal instalments for the period commencing 1 July and ending 30 June each year.

Planning/Resource Management

Partially Operative District Plan: Medium density residential zone
Operative District Plan Zoning: Living MD1

The Council has undertaken a review of the Operative District Plan and through this process it has developed a New District Plan ('The Partially Operative District Plan') which provides clear objectives, policies and rules to manage the effects of land use activities on the environment, but also sets a clear direction for our district's development and reflects our communities' needs and expectations. It also incorporates any changes in legislation, national and regional policy statements, environmental standards and other regulations.

The period for lodging appeals against decisions on the Partially Operative District Plan closed on the 6th of October 2023 and the Council released the Appeals Version of the Partially Operative District Plan on 27th November 2023. Many provisions in Partially Operative District Plan are now beyond challenge and are operative/treated as operative (pursuant cl 103 of Schedule 1 and s86F of the Resource Management Act (1991).

The Operative District Plan now only applies where a relevant provision in the Partially Operative District Plan remains subject to appeal. For more information visit https://selwyn.govt.nz/property-And-building/planningstrategies-and-plans/selwyn-district-plan/selwyn-district-plan-review

Resource Consent 235725
Change Of Conditions To Vary Conditions Of Rc225646.
Decision Notified 18/01/2024
Granted By Local Authority Officer 18/01/2024

Resource Consent 235726
Change Of Conditions To Vary Conditions Of Rc225647
Decision Notified 18/01/2024
Granted By Local Authority Officer 18/01/2024

Resource Consent 245458b
Change Of Conditions To Allow For An Additional Stage (9b).
Further Information Required 13/05/2026

Resource Consent 245459b
Change Of Conditions Regarding Row Easements
Formally Received 30/04/2026

Resource Consent 245460
To Cancel Consent Notices On Lots 700-703 Rc245118 Requiring Minimum Number Of Lots Associated With Rc245458
Decision Notified 05/08/2025
Granted By Independent Commissioner(s) 05/08/2025

Resource Consent Pc210078
Rezoning Of A Block Of Land On The South West Corner Of Selwyn Road And Lincoln Rolleston Road From Rural Inner Plains To Living Z.
Plan Change Operative 07/09/2022
Granted By Council 13/04/2022

Resource Consent 225646
To Undertake A Staged Subdivision To Create 75 Residential Allotments, 5 Roads, 1 Reserve And 1 Balance Allotment.
Section 224 Issued 28/03/2024
Granted By Local Authority Officer 30/11/2022

Resource Consent 245259b
Change Of Conditions Regarding Row Easements.
Withdrawn 06/05/2026

Resource Consent 245458
To Undertake A Subdivision To Create 282 Residential Lots, 1 Balance Lot, 2

Recreation Reserves, 3 Local Purpose Reserves, 1 Utility Reserve And Associated Roads As Part Of Stage 7-17 Of Broadfield Grange Subdivision
Section 224 Issued 05/05/2026
Granted By Independent Commissioner(s) 05/08/2025

Resource Consent 245458a
Change Of Conditions To Vary Condition 1 Of Rc245458
Decision Notified 29/10/2025
Granted By Local Authority Officer 29/10/2025

Resource Consent 245459a
Change Of Conditions To Vary Condition 1 Of Rc245459
Decision Notified 29/10/2025
Granted By Local Authority Officer 29/10/2025

Resource Consent 225647
To Undertake Earthworks Associated With Rc 225646
Decision Notified 30/11/2022
Granted By Local Authority Officer 30/11/2022

Resource Consent 245258b
Change Of Conditions To Allow For An Additional Stage (9b).
Withdrawn 06/05/2026

Resource Consent 245459
Land Use Under The Nes-cs And For Earthworks Associated With Rc245458 And Traffic Non-compliances
Decision Notified 05/08/2025
Granted By Independent Commissioner(s) 05/08/2025

Planning Notes

The information provided on this LIM has come from the information lodged against the property file/information and GIS at the time of processing. Please note that the resource consents, fill certificates and other relevant property files listed are based on what is available on our general property information, and that there may be other documents for the property which have not yet been added to the property record.

Resource Consents often contain a multitude of information and reports that are not ordinarily separately referenced or included in the LIM itself. Information identifying each (if any) special feature or characteristic of the land concerned, including but not limited to potential erosion, falling debris, subsidence, slippage, alluvion, or inundation, or likely presence of hazardous contaminants.

Preliminary Site Investigation Reports, Detailed Investigation Site Reports and Geotechnical Reports are submitted as part of the subdivision Resource Consent Process it is not likely to be currently of relevance in relation to the "land concerned", otherwise it would be elsewhere noted on the LIM to the extent any issues still apply following subdivision).

Any resource applications or consents that may contain information relating to the land which is not otherwise included in the LIM, including Geotechnical, Environmental and other expert reports, can be obtained via Selwyn District Council Information Management team on information.management@selwyn.govt.nz

Reference: DEV-RO11
This property has been identified in the Partially Operative District Plan as being located within a Development Area which spatially identifies and manages an area where additional place-based provisions may apply to subdivision and development. For further information visit https://eplan.selwyn.govt.nz/review or contact the duty planner on 0800 SELWYN (0800735996)

Resource Consent RC245458

Note that this subdivision has not been issued with a Completion Certificate and that further works or inspections maybe required before this Certificate can be issued. If you are purchasing this property 'off the subdivision plans' meaning that no Record of Title has yet been issued, it is strongly recommended that you thoroughly check the conditions of the subdivision consent which created this site. These conditions may place restrictions on how the site is used which will be recorded on the Record of Title though a consent notice or covenant.

No residential unit can be established until a Section 224(c) Completion Certificate is issued for the underlying subdivision.

There is a consent notice on the Record of Title to this property. This records a condition/s of a subdivision consent which must be complied on an ongoing basis.

Building

There are no known buildings sited on this property at the time of issuing this report.

Buildings erected prior to 1965 may not have a building permit record or had inspections carried out.

All building products and materials have a designed life, and must be maintained in accordance with the manufacturer's specifications.

In the case of building permits and building consents no further inspections have been carried out by the council since these structures were completed.

Any concerns of this nature should be referred to an organization that carries out property checks or the product manufacturers.

Schedule 1 Exempt Building Work

Under section 42A of the Building Act 2004 building owners can carry out certain types of building work specified in Schedule 1 of the Building Act 2004 without need to obtain building consent approval. Where Council holds any information provided by a property owner in relation to exempt works undertaken on the property it is important to note that Council do not check or review the documentation for compliance, it is simply filed for record keeping purposes and not to satisfy any statutory obligation. Any information held of this nature has been provided at Councils discretion under Section 44A (3) of the Local Government Official Information and Meetings Act 1987 without any representation or warranty.

Services

Water

Rolleston Water supply will be available to this subdivision, but it is not connected - the connections will be metered. However, this Lot is still under one valuation number. It is noted in the Water Supply Bylaw 2008 that each Premises may only have one Point of Supply (11.2(b)), you can find a copy of this bylaw on the Selwyn District Council website. Until such a time as it is subdivided properly into separate lots, only one connection will be allowed for water. This means that only one water rates bill will be sent to only one owner who would essentially pay for all the water on the site. Any further connections to the water network cannot proceed without the necessary engineering approvals.

Once an application for sub-division has been formally put in place and approved by Council then new connections can be applied for through the council website: https://www.selwyn.govt.nz/services/water/water-supplies/water-connections/new-water-connection-approval-and-declaration

Any lateral that runs along a neighbouring dwelling/lot will require a formal easement to be put in place to protect the service from being built over in the future.

Please ensure that the toby box is not buried or covered over during the building or landscaping process. Please also keep any plantings a minimum of 0.5m away from the toby box to avoid problems with maintenance and access in the future.

Sewer

Once the property is subdivided properly, the individual Lots will be serviced through Council's gravity sewer network. Where laterals cross over individual lots, the applicant to note that Council operators may require access to the sewer pipes for any maintenance or renewal works in the easement area over the services and may require the surface to be excavated. Council will not be liable for reinstatement of hard surfaces to exact shade or texture matching. The Drainage design will require an engineering approval.

Stormwater

Stormwater to be determined with new subdivision, contact asset dept for more information. This property may be located within an area covered by an Environment Canterbury stormwater consent. It is the responsibility of the property owner to contact Environment Canterbury to ensure that any activity undertaken on site complies with the relevant consent conditions. For further information contact Environment Canterbury customer services on 0800 324 636 or visit their website.

Note – the above describes the current roof water disposal type and does not reflect the future situation, which should be determined as part of the subdivision (if applicable). For more information please contact Council.

If you have any questions about the Water, Sewage or Stormwater information above please contact the Selwyn District Council Water Department at 0800 SELWYN or contactus@selwyn.govt.nz

Water Races

None known

Drains

None known

Kerbside Waste Collections

The Council provides refuse and recycling collection services for most residential and rural residential properties where these properties occur alongside maintained public roads. Private roads and Right of Ways (as maybe referenced in the Transportation Notes pertaining to this LIM) will not be directly serviced as these access ways are not usually of a sufficient standard to be used safely and efficiently by the collection vehicles. This could also apply to other public roads or streets that are narrow and/or have a lack of vehicle turning facilities. Rural and high country areas and settlements are not covered by regular collection services however localised refuse drop off facilities maybe available for use in specific areas. For further details and advice on refuse collection and recycling services as they may pertain to the property please phone the Council's Asset department on phone 3472 800.Selwyn District Council - Collection Days & Routes

If your address shows “no results found”, this means:

- your property is not serviced directly by kerbside collections
- you have a new property and either
- you have requested for your property to be added to the route and it is in the process of being added
- you have not yet requested for your property to be added to the route.

Please contact the Council for further detail.

Land and Building Classifications

Energy Infrastructure and Transport

None known

Culture and Heritage

None known

Natural Environment

None known

District-wide matters

None known

Area-specific matters

None known

Land Notes

Land Notes: The flight paths for the Christchurch International Airport takes air traffic over this general area.

Land Notes: This property is located within the area encompassed by the Greater Christchurch Urban Development Strategy (UDS). The UDS is a joint initiative to plan and manage the growth of the Greater Christchurch Region over the next 35 years and is a partnership between the Christchurch City Council, Environment Canterbury, the Waimakariri District Council, Selwyn District Council, and Waka Kotahi NZ Transport Agency.
The Selwyn District Council is developing several strategic documents that seek to implement the UDS that may have an impact on this property in the future. Further information on Council projects can be found on the Council's website www.selwyn.govt.nz or by contacting the planning department on 0800 SELWYN (0800735996).

Land Notes: This property is within the area encompassed by the 2007 Christchurch, Rolleston, and Environs Transportation Study (CRETS). The published Strategy outlines a range of strategic transportation initiatives to cater for long term growth in this area of the district. This includes the upgrading of existing roads and the provision of new roads which may affect private property. Further information on this Study can be viewed on the Councils website www.selwyn.govt.nz under Transportation and Roading.

Please note the following attached reports:

- Solid Validation Report - 4/572 Selwyn Road, Rolleston, Engeo, commissioned by Broadfield Grange Limited, 11/10/2022. This report affects a broad area or community. Purpose of the report: subdivision/land use.
- Geotechnical Investigation Report, Engeo, commissioned by Broadfield Grange Limited, 16/06/2022. This report affects a broad area or community. Purpose of the report: subdivision/land use.

Please contact our Information Management Team at Information.Management@selwyn.govt.nz for further information

Listed Land Use Register (LLUR):

Hazardous activities and industries involve the use, storage or disposal of hazardous substances. These substances can sometimes contaminate the soil. Environment Canterbury identifies land that is used or has been used for hazardous activities and industries. This

information is held on a publicly available database administered by Environment Canterbury called the Listed Land Use Register (LLUR).

The Selwyn District Council may not hold information that is held on the LLUR, therefore, it is recommended that you check Environment Canterbury's online database at www.llur.ecan.govt.nz.

Residential Swimming Pool

No pool registered to this property.

Land Transport Requirement

Selwyn Road is a formed and sealed arterial road maintained by Selwyn District Council. Nearby roads are under construction here due to subdivision development.

This property maybe effected by proposed roading and access changes relating to the Waka Kotahi NZ Transport Agency Rolleston Flyover and State Highway Access Improvement Project. Further information and contact details can be found at www.nzta.govt.nz/rollestonflyover

Natural Hazards

This section sets out information that the Council holds relating to natural hazards, such as earthquake, tsunami, erosion, landslip, liquefaction/sedimentation and subsidence, wind and snow, or flooding/inundation.

Climate change is causing natural hazards to become more severe, occur more often, and affect a wider range of areas.

If the Property is identified below as being subject to a natural hazard, it may have been issued a building consent with a waiver or modification of the Building Code to confirm that building work will accelerate, worsen, or result in a natural hazard on the land on which the building work is to be carried out or any other property. If a waiver or modification has been issued, this will be noted in the Building section of the LIM above.

You can obtain further information about natural hazard matters from:

- The District Plan Natural Hazard chapter: District Plan - Partially Operative Selwyn District Plan (Appeals Version)
- https://experience.arcgis.com/experience/f7b9c60d5a624147bb731b1afa7788dd#data_s=where%3AdataSource_2-19b106a45d6-layer-17%3A%22Assessment_ID%22%3D%272405513660%27&zoom_to_selection=true

– use this map to view any of the natural hazards identified below that impact this Property or in the vicinity of the Property

- Our Duty Planner service at planning.technical@selwyn.govt.nz, or call 0800 SELWYN (735 996).

Earthquake

All properties in New Zealand may be affected by earthquakes, however, the Council holds no additional information about potential earthquake hazards at this Property.

Earthquake Prone Buildings

If this Property has an Earthquake Prone Building, this will be noted in the Building section of this LIM under "Earthquake Prone Buildings".

Erosion

District Plan information relating to erosion

None known

Landslip and Rockfall

Regional mapping of landslides / rock avalanches

An earthquake hazard assessment for infrastructure commissioned by Environment Canterbury in 2006 included a regional-scale map of earthquake-induced landslide susceptibility and locations of known rock avalanches. Further information can be found in the technical report: Selwyn District Engineering Lifelines Project: Earthquake Hazard Assessment, Geotech Consulting Ltd commissioned by Environment Canterbury, August 2006. The scope of this report is the Selwyn District. The purpose of the report was to assess earthquake hazards and their potential impacts on engineering lifelines (infrastructure) in Selwyn District.

Climate change may cause increased rain and storm intensity and frequency, and vegetation changes. These impacts of climate change may reduce the Property's resilience and exacerbate the landslip and rockfall hazard.

Liquefaction and Subsidence

Liquefaction / Geotechnical risk

The Property is within an area where liquefaction damage is possible in future earthquakes. The Selwyn District Council has mapped areas where a liquefaction assessment is required, and other areas where a liquefaction assessment is only needed for certain activities. View Selwyn

District Council's maps. View Selwyn District Plan rules relating to liquefaction / geotechnical planning requirements.

Environment Canterbury has separately identified additional areas where liquefaction is possible. View Environment Canterbury's map showing areas where liquefaction is possible. Further information about liquefaction generally can be found in the following technical reports:

- Review of liquefaction hazard information in eastern Canterbury, including Christchurch City and parts of Selwyn, Waimakariri and Hurunui Districts, Environment Canterbury, December 2012. This report covers the Coastal Canterbury from the Waipara River mouth to the Rakaia River mouth, including Banks Peninsula, and inland to Rangiora, Aylesbury, Selwyn and Southbridge. The purpose of this report was to collate liquefaction occurrence during the 2010/11 Canterbury earthquakes, and to determine liquefaction vulnerability.
- Selwyn District Engineering Lifelines Project: Earthquake Hazard Assessment, Geotech Consulting Ltd commissioned by Environment Canterbury, August 2006. This report covers the Selwyn District. The purpose of the report was to assess earthquake hazards and their potential impacts on engineering lifelines (infrastructure) in Selwyn District and for use in infrastructure and emergency management planning.

Climate change may cause changes in groundwater and sea level rise. These impacts of climate change may reduce the Property's resilience and exacerbate the impacts of the liquefaction and subsidence hazard.

As part of any building consent application, you may need a site-specific assessment or site subsoil investigation to establish the level of susceptibility to liquefaction or to confirm that 'good ground' can be achieved for any building work. The scope and testing of any site-specific assessment must be carried out by a CPEng Geotechnical engineer. The ground bearing capacity in this area may not achieve the requirements of the NZ Building Code Clause B1, and specific design may be required. The definition of 'good ground' can be found in the Definitions section of the NZ Building Code Handbook, and appropriate test methods are detailed in either NZS3604, or NZBC B1/VM4.

Areas where there was evidence of liquefaction were mapped following the 2010/11 Canterbury earthquakes by Tonkin & Taylor for the Earthquake Commission (urban areas) and by a group of researchers for Environment Canterbury (rural, commercial and industrial areas). These are available on Environment Canterbury's liquefaction map. Further information can be found in the technical report: Review of liquefaction hazard information in eastern Canterbury, including Christchurch City and parts of Selwyn, Waimakariri and Hurunui Districts, Environment Canterbury, December 2012.

This report covers Coastal Canterbury from the Waipara River mouth to the Rakaia River mouth, including Banks Peninsula, and inland to Rangiora, Aylesbury, Selwyn and Southbridge. The purpose of this report was to collate liquefaction occurrence during the 2010/11 Canterbury earthquakes, and to determine liquefaction vulnerability.

Tsunami

None known

Flooding and Inundation

District Plan information relating to flooding and inundation

This Property is within the following flooding or inundation overlay(s) or areas in the District Plan. Information and reports about the relevant overlay are included below. Climate change may cause increased rain and storm intensity and frequency, and sea level rise. These impacts of climate change may reduce the Property's resilience and exacerbate any flooding and inundation hazard.

Plains Flood Management Overlay

The Plains Flood Management Overlay in the Council's District Plan identifies areas where flooding from a 200-year Average Recurrence Interval (ARI) flood event needs to be managed. View a map of the overlay. View the rules relating to the overlay. Further information can be found in the following technical reports:

- Selwyn River/Waikirikiri floodplain investigation, ECAN report, September 2019

- Regional Policy Statement Modelling for Selwyn District Council – District Plan, DHI Water and Environment Limited report, November 2019

Environment Canterbury information regarding flooding and inundation

Historic Flooding Photographs

Photographs showing the property during or following past flood events may be available. Flood photographs are available on Environment Canterbury's flood imagery register.

Other flooding and inundation information

Climate change may cause increased rain and storm intensity and frequency, and sea level rise. These impacts of climate change may reduce the Property's resilience and exacerbate any flooding and inundation hazard.

Flood modelling

This Property may be susceptible to flooding from the Selwyn River and/or in heavy rainfall events. View the flood model results. More detail can be found in the technical report: Selwyn District Flood Model - Hydraulic Model Build Report, Tonkin + Taylor commissioned by Selwyn District Council, August 2025.

Ground Water Level

The ground water level at this Property is Less than 30m below ground
for this Property. A high ground water level may exacerbate any flooding at this Property, or the impact of any flooding at this Property.

Exposure Zones

Exposure zones are standardised categories for a property's potential exposure to certain risks. Any proposed building work may need specific engineering design, depending on the exposure of the construction site. The categories are based on two standards: NZS3604:2011 and AS/NZS1170:2002.

	NZS3604:2011	AS/NZS1170:2002
Wind Region	A	A7
Snow Zone	N4	N4 Sub-alpine
Earthquake	Zone: 2	Z Factor: 0.3
Approximate Altitude (Amsl)	35m	-
Exposure Zone	B	-

Exposure Zone Descriptions

Zone B: Low
Inland areas with little risk from wind blown sea-spray salt deposits

Zone C: Medium
Inland coastal areas with medium risk from wind blown sea-spray salt deposits. This zone covers mainly coastal areas relatively low salinity. The extent of the affected area varies significantly with factors such as winds, topography and vegetation.

Zone D: High
Coastal areas with high risk wind blown sea-spray salt deposits. This is defined as within 500 m of the sea including harbours, or 100 m from tidal estuaries and sheltered inlets.

Special Land Features

Soil Type

Templeton moderately deep fine sandy loam
Eyre shallow sandy loam

Land Fill

Engineered fill may be present on this site. As the subdivision process has yet to be completed council has no information available regarding extent and depth of any fill that may have been placed on site. A site subsoil investigation will need to be carried out prior to building to verify that 'Good Ground' can be achieved on the site and to determine the subsoil classification in accordance with NZS1170. Verification of good ground and data of site investigation must be submitted as part of the building consent or certificate of acceptance application. The definition of 'Good Ground' can be found in the definitions section of the New Zealand Building Code Handbook, and appropriate test methods are detailed in either NZS3604, or NZBC B1/VM4.

Licences/Environmental Health

Flood Assessment Certificate FC240141
Expired 02/04/2026
Expires 02/04/2026

Network Utility Operators

Information related to the availability of supply, authorisations etc. (e.g. electricity or gas) can be obtained from the relevant Network Utility Operator.

Other Information

1. The applicant is advised that the Environment Canterbury may have other information in relation to this property including, but not limited to:
    a) Discharge consents.
    b) Well permits.
    c) Consents to take water.
    d) The existence of contamination and/or hazardous sites.
    e) Flooding.
    f) Clean air discharge compliance.

Further information may be obtained from Environment Canterbury by requesting a Land Information Request (LIR). To find out more contact the Environment Canterbury on 0800 ECINFO (0800 324 636) or at http://www.ecan.govt.nz/

2. The following further information is supplied on the basis set out in note 2 below.

Notes

1. The information supplied in the sections of this report, other than 'Other Information', is made available to the applicant pursuant to Section 44A(2) of the Local Government and Official Information Act 1987 by reference to Council files and records. No property inspection, or title search, has been undertaken. To enable the Council to measure the accuracy of this LIM document based on our current records we would appreciate your response should you find any information contained herein which may be considered to be incorrect or omitted. Please telephone the Council on 0800 SELWYN (375 996).
2. The information or documents supplied to the applicant and referred to in the 'Other Information' section of this report has been supplied to the Council by property owners, their agents and other third parties. That information is made available pursuant to section 44A(3) of the Local Government and Official Information Act 1987 on the basis that:
   a) The information may be relevant to the purposes for which this report is obtained;
   b) The Council does not warrant or represent the accuracy or reliability of the information. If the subject matter of that information is important to the applicant it is recommended that relevant professional advice should be taken before reliance is placed upon that information.
3. The information included in the LIM is based on a search of Council records only and there may be other information relating to the land which is unknown to the Council. Council records may not show illegal or unauthorised building or works on the property. The applicant is solely responsible for ensuring that the land is suitable for a particular purpose.
4. Schedule 1 Exempt Building Work

   Building owners can carry out certain types of building work without needing to obtain a building consent. This exempt building work is listed in Schedule 1 of the Building Act 2004.

   It is the owners' responsibility to ensure that any exempt building work done complies with the Building Code and fits within the provisions of the schedule before they carry out the work.

   Please note that Council do not check or review documentation for compliance where information on exempt work has been provided by a property owner to Council. This

information is simply filed for record keeping purposes and not to meet any statutory obligation.

Any information of this nature held by Council has been provided at Councils discretion under Section 44A (3) of the Local Government Official Information and Meetings Act 1987 without any representation or warranty.

5. The Council has used its best endeavors to ensure that all information provided in this LIM report is correct and complete in all material respects. In the event that a material error or omission can be proven the Council's liability, whether in contract or in tort shall be limited to the fee paid to Council to obtain this report.
6. This information reflects the Selwyn District Council's current understanding of the site, which is based only on the information thus far provided to it and held on record concerning the site. It is released only as a copy of those records and is not intended to provide a full, complete or totally accurate assessment of the site. As a result the Council is not in a position to warrant that the information is complete or without error and accepts no liability for any inaccuracy in, or omission from, this information.
7. The information contained in this Land Information Memorandum is current at the date the memorandum is issued. Further relevant information may come into the Council's possession subsequent to the date of issue.

Information Management Team

Date: 20/05/2026

LIM Report Legend

Base Layers

Road
- Road

Railway
- Railway

District Boundary
- District Boundary

Township Boundary
- Township Boundary

Ratepayer Information
- Ratepayer Information

Parcels
- Parcels

PODP - Zones and Precincts

Precincts
- Commercial Precincts
- Industrial Precincts
- Airfield Precincts
- Rural Precincts

Zones
- Large lot residential zone
- Low density residential zone
- General residential zone
- Medium density residential zone
- Settlement zone
- General rural zone
- Neighbourhood centre zone
- Local centre zone
- Large format retail zone
- Town centre zone
- General industrial zone
- Special purpose zone

Zone and Water Services

SWL Water Points
- Supply Point
- Valve
- Node
- Hydrant
- Tank
- Irrigation
- Equipment
- Facility
- Meter
- Fire Plant

SWL Water Lines
- Pipe - Treated
- Irrigation
- Pipe - Untreated
- Pipe - Sewer
- Pipe - Unknown
- Other

SWL Private Water Points

SWL Private Water Lines

SDC Water Points
- EQUIPMENT - BORE
- EQUIPMENT _ GENERATOR
- EQUIPMENT - SAMPLE TAP
- EQUIPMENT - OTHER
- FACILITY
- FIRE PLANT
- HYDRANT
- IRRIGATION
- NODE
- OBSOLETE
- SUPPLY POINT
- TANK
- VALVE

SDC Water Lines
- DIM LINE
- DUCT
- IRRIGATION
- NON SDC SERVICE
- OBSOLETE
- OUTLINE
- PIPE - TREATED
- PIPE - UNTREATED
- PIPE - SEWER
- SITE_BOUNDARY

SWL Sewer Points
- Manhole
- Valve
- Chamber
- Node
- Equipment
- Facility

SWL Sewer Lines
- Gravity
- Pressure
- Rising
- Other

SWL Private Sewer Points

SWL Private Sewer Lines

SDC Sewer Points
TYPE
- CHAMBER
- EQUIPMENT
- FACILITY
- MANHOLE
- NODE
- VALVE

SDC Sewer Lines
- OUTLINE
- DIM LINE
- DUCT
- IRRIGATION
- NON SDC SERVICE
- OBSOLETE
- OUTLINE
- PIPE_GRAVITY
- PIPE_RISINGMAIN
- SITE_BOUNDARY

Storm Points
TYPE
- CHAMBER
- EQUIPMENT
- FACILITY
- INLET/OUTLET
- MANAGEMENT
- MANHOLE
- NODE
- SOAKHOLE
- SUMP
- VALVE

Storm Lines
TYPE
- CHANNEL
- DIM LINE
- OBSOLETE
- OUTLINE
- PIPE
- SITE_BOUNDARY
- Soakhole w/Hoz Soakage
- StopBank

Storm Polygons
TYPE
- CATCHMENTS
- CONSENT AREA
- GROUNDWATER LESS 6M
- OUTLINE OF BASIN
- RATED AREA

Stormwater Management Area
- Stormwater Management Area

West Melton Observatory Zone
- West Melton Observatory Zone

Planning Zones
- High Country
- Port Hills
- Existing Devlopment Area
- Living 1
- Living 2
- Living 3
- Living X
- Living West Melton (North)
- Living Z
- Deferred Living
- Business 1
- Business 2
- Business 3
- Inner Plains
- Outer Plains
- Malvern Hills
- Key Activity Centre
- Living West Melton (South)

Liquefaction Drains and Water Race

CDrain_pt
- GATE
- Site
- WEIR

CDrain_ln
- DRAIN
- ECan
- OUTLINE
- StopBank
- Site Boundary

WRace_pt
- DISCHARGE
- DIVIDE
- EQUIPMENT
- GATE
- GRILL
- HEADWALL
- MANHOLE
- NODE
- POND
- SITE
- SHAFT
- SOAKHOLE

WRace_ln
- AQUEDUCT
- CULVERT
- DIM LINE
- EMERGENCY DISCHARGE
- INTAKE
- LATERAL
- LOCAL
- MAIN
- OBSOLETE
- OUTLINE
- SIPHON
- TUNNEL

SDC Cleaned
- SDC Cleaned

Project Extent
- Project Extent

Boundary Between Liquefaction Assessment Zones
- Boundary Between Liquefaction Assessment Zones

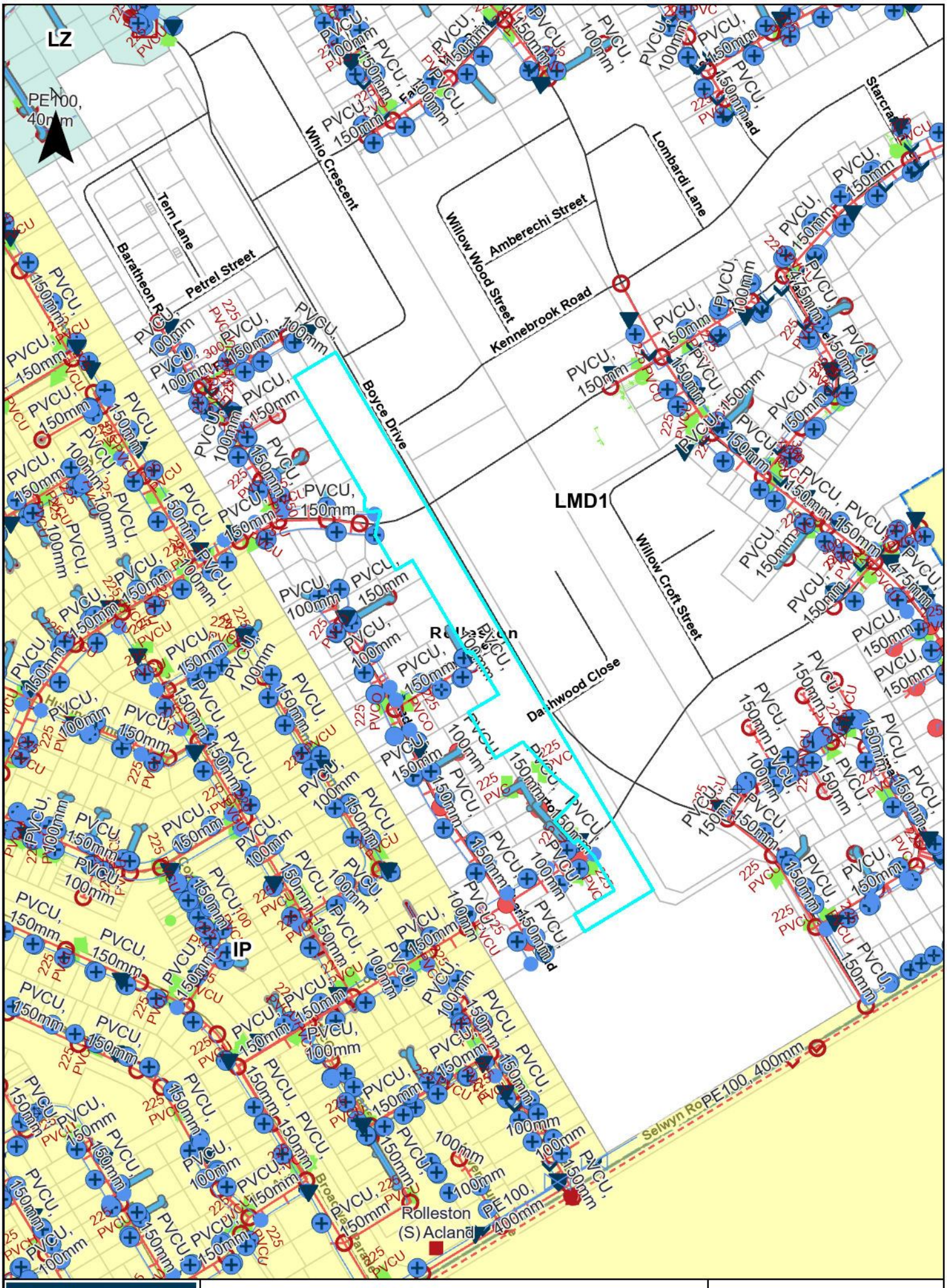
Liquefaction Susceptibility
- DBH TC Zoned Area
- Damaging liquefaction unlikely
- Liquefaction assessment needed

Ecan River Protection Scheme
- Properties Beside Rivers
- Halswell Staff Gauges
- Halswell Floodgates
- Halswell Drainage

Greendale Fault
- Greendale Fault 50m Buffer
- Fault Lines (GNS 2013)
- Folds (GNS 2013)

Biodiversity
- Canterbury Plains SDC AB and C Classes
- Endangered Flora and Fauna
- Potentially Significant Sites
- Confirmed SNA Sites
- Significant Natural Areas (Final 115)

LIM REPORT - Zone and Water Services

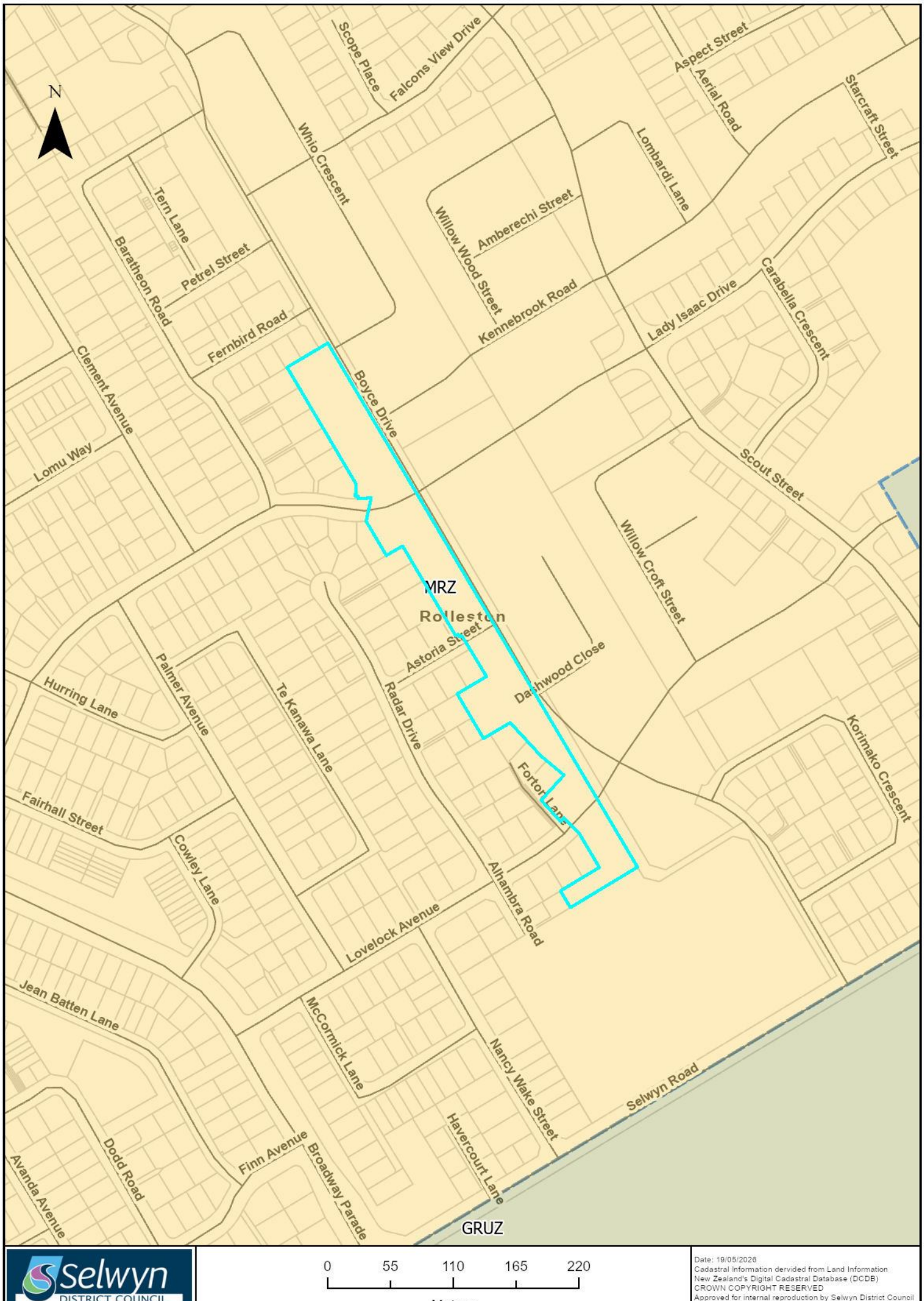


0 55 110 165 220

Metres

Date: 19/05/2026

LIM REPORT - PODP Zone and Precinct



Selwyn DISTRICT COUNCIL

0 55 110 165 220

Metres

Date: 19/05/2026
Cadastral Information dervided from Land Information New Zealand's Digital Cadastral Database (DCDB)
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RESOURCE CONSENT INFORMATION

This document is one of three pages titled “Resource Consent Information” which should be read together.

- Because of the large number of resource consents only consents which fall within the red buffer as identified on the map have been included with this report.

- If further information is required please contact the Council’s Planning Department – Phone Direct 03 3472 868.

- Every effort is made by the Council to identify resource consent in proximity to the property subject to this LIM application. However, it is suggested that a site inspection be undertaken by prospective purchasers to identify any land uses of interest. These may include uses which have existing use rights or other uses which are permitted under the Council’s District Plan.

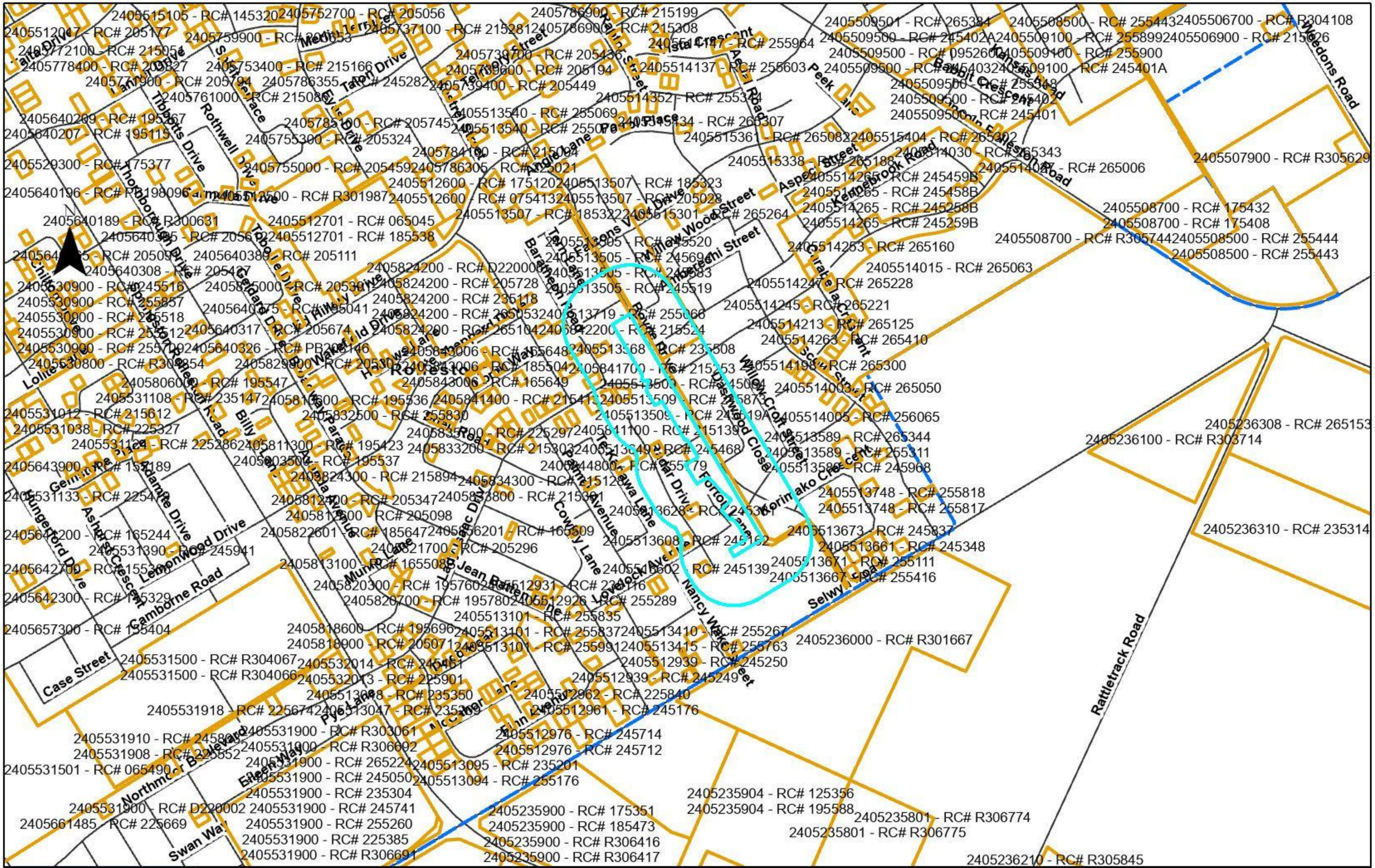
Resource Consent Status Codes:

GHP	Granted by Hearing
GEC	Granted by Environment Court
GDEL	Granted by Delegation
GCOM	Granted by Commissioner
DCOM	Declined by Commissioner
DHP	Declined by Hearing
WD	Withdrawn application
AP	Approved
DC	Declined
Blank	No decision issued
DN	Decision Notified

ADN	Appeal Decision Notified
AE	Appeal expiry
AEC	Appeal Heard by Environment
AN	Abatement Notice
AR	Appeal received
ARI	Application returned incomplete
AWD	Appeal withdrawn
CC	Cancelled
CCI	Certificate Compliance Issued
D37	Deferred under s.37
D37E	s.37 deferral ends
D91	Deferred under s.91
D91E	s.91 deferral ends
ECDN	Environment Court Decision notified
FI	Further Information
FICR	Further Information request - no clock restart
FR	Formally received
HD	Hearing Date
HH	Hearing held
INV	Invoiced
IR	Information received
LAPS	Lapsed
LD	Lodged
LN	Limited Notified
LS	Lapsed
ODN	Objection decision notified
OH	On Hold
OR	Objection received

PA	Pre- application
PN	Publically notified
PS	Process suspended
RAD	Recommendation adopted by Council
RRA	Recommendation to required authority
S223	Section 223
S224	Section 224
SC	submissions closed
WAR	Written Approval Requested
WARE	Written Approvals Received

2405513660



Selwyn DISTRICT COUNCIL

0 187.5 375 562.5 750

Metres

Date: 19/05/2026
Cadastral Information dervided from Land Information New Zealand's Digital Cadastral Database (DCDB)

Data Projection: NZGD2000 New Zealand Transverse

Assessment_ID	RC Number	Proposal	Decision Date
2405513505	245519	To undertake a 90-lot residential subdivision including the creation of reserves and roads to be vested in Selwyn District Council.	2024-12-16
2405513505	245520	To undertake bulk earthworks associated with the subdivision consent, including NES-CS consent.	2024-12-16
2405513505	245583	RC245583 Cancellation of Consent Notice 11823530.5 in accordance with s221 of the Resource Management Act 1991.	2024-12-16
2405513505	245694	Change of conditions to add conditions 3, 4, 5 & 6 to RC235791(s224 conditions)	2024-10-21
2405513509	245064	To undertake a subdivision to create three lots	2024-06-27
2405513509	245519A	To change conditions to RC245519 to insert new conditions to allow for the consent holder to construct residential units on the allotments in stages 2, 3 & 4 prior to the issue of section 224(c) Completion Certification	2026-05-14
2405513509	245873	To change conditions of RC235790 and to insert additional conditions to RC235791.	2020-10-21
2405513557	245377	To construct a vehicle crossing within the minimum setback required from an intersection	2024-06-21
2405513558	235742	To erect a residential unit not complying with the outlook space requirements and to construct a vehicle crossing within the required setback from an intersection	2024-02-23
2405513560	235679	To construct two residential units, one of which does not comply with the minimum glazing requirement, and a vehicle crossing with a non-complying intersection setback.	2023-12-20
2405513564	235685	To erect a residential unit with non-complying outlook space requirements.	2024-01-24

2405513568	235508	To establish a non-complying vehicle crossing.	2023-10-05
2405513602	245139	To erect a residential unit with non-complying outlook space requirements.	2024-03-15
2405513608	245162	To establish two residential units with a shared non-compliant vehicle crossing	2024-05-14
2405513628	245381	To undertake a subdivision to create two residential lots	2024-07-23
2405513628	245382	To construct a residential unit exceeding site coverage associated with subdivision RC245381	2024-07-23
2405513649	245468	To construct a residential unit with a non-compliant vehicle crossing.	2024-07-16
2405513653	225647	To undertake earthworks associated with RC 225646	2022-11-30
2405513719	255066	To construct a residential unit which will have a vehicle crossing within the required setback from an intersection, and to build the residential unit prior to the issuing of a s224 certificate.	2025-03-03
2405513793	PC210078	Rezoning of a block of land on the south west corner of Selwyn Road and Lincoln Rolleston Road from Rural Inner Plains to Living Z.	2022-04-13
2405513793	255015	To establish a non-complying vehicle crossing within 20m of an intersection	2025-04-11
2405513793	225646	To undertake a staged subdivision to create 75 residential allotments, 5 roads, 1 reserve and 1 balance allotment.	2022-11-30
2405513793	235725	Change of conditions to vary conditions of RC225646.	2024-01-18

ENGEO Limited
124 Montreal Street, Sydenham, Christchurch 8023
PO Box 373, Christchurch 8140, New Zealand
T: +64 3 328 9012 F: +64 3 328 9013
www.engeo.co.nz

Project Number 18991.001.001

Geotechnical Investigation

Broadfield Grange, Rolleston, Christchurch

Submitted to:
Broadfield Grange Limited
174 Hamptons Road
Prebbleton, Rd 6
Christchurch 7676

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Appendices

ENGEO Document Control:

Report Title	Geotechnical Investigation - Broadfield Grange, Rolleston			
Project No.	18991.001.001	**Doc ID**	01	
Client	Broadfield Grange Limited	**Client Contact**	Brad Wilson	
Distribution (PDF)	Brad Wilson			
Date	**Revision Details / Status**	**Author**	**Reviewer**	**WP**
16/06/2022	Issued to Client	JRW	DB	BK

1 Introduction

ENGEO Ltd was requested by Broadfield Grange Limited to undertake a geotechnical investigation of the property at Broadfield Grange, Rolleston, Christchurch (herein referred to as 'the site'). This work has been carried out in accordance with our signed master agreement dated 3 June 2022 (ENGEO Ref: P2022.001.311).

The purpose of this assessment was to conceptualise a geological model of the site, assess the likely future land performance, comment on the suitability of the site for residential subdivision, address the requirements of Section 106 of the Resource Management Act (RMA), and provide recommendations for subdivision works and foundations for typical timber framed residential dwellings in support of subdivision consent.

Our scope of works included the following:

- Complete a desktop study of relevant available geotechnical and geological publications, including the NZ Geotechnical and Environment Canterbury Databases.
- Undertake a geotechnical site walkover.
- Organise service location for the proposed test locations.
- Undertake and log up to seven hand augers with Scala penetrometer tests to a maximum depth of approximately 0.9 m below ground level or practical refusal to assess the near surface material types and strength characteristics.
- Observe the excavation of up to seven test pits including geotechnical logging of the exposed soils. These pits were approximately 2.6 m deep, 3 m long and 1 m wide and loosely backfilled upon completion with the excavated soil. Recompaction was be accomplished by tamping with the excavator bucket.
- Preparation of this report outlining our findings on the ground conditions and the suitability of the site for residential subdivision including:
    - Geotechnical advice on the likely foundation Technical Category.
    - Conceptual foundation recommendations for typical timber framed residential dwellings.
    - Address likely geohazards as required by Section 106 of the RMA.
    - Provide a Statement of Professional Opinion on the Suitability of Land for Subdivision.

2 Site Description

The site comprises one property with a total area of approximately six hectares as depicted on the development plan presented in Appendix 1. ENGEO previously completed a plan change geotechnical report that included this site dated 9 December 2020, attached as Appendix 2. Our 9 December 2020 report should be read in conjunction with this report.

3 Geological Model

3.1 Regional Geology

The site has been regionally mapped by GNS (Forsyth et al., 2008) as being underlain by brownish grey river alluvium (Q2a).

3.2 Geomorphology

The site comprises relatively flat ground, with gentle undulations and depressions in some areas. As evident on aerial imagery (Canterbury Maps, 2019) and observed during our site walkover conducted on 2 June 2022, undulating and depressed ground can be attributed to paleo-channels, which traverse the site in a general northwest to southeast direction. Based on observations, sandy silt deposits with variable thickness are expected to have in-filled the paleo-channels where they have not remained as channel features.

3.3 Geohazards

3.3.1 Seismicity

There are no known or mapped faults in the immediate area of the site, however the site may be at risk of ground shaking induced by movement of proximal or distal faults.

The site is located between two recently discovered fault systems, the Greendale Fault and the Port Hills Fault, the ruptures of which initiated the ongoing Canterbury Earthquake Sequence (CES). The Greendale Fault has been mapped approximately 6 km northwest of the site and trends roughly east-west with a surface rupture length of approximately 28 km (GNS, 2015), while the Port Hills Fault remains unmapped as the fault did not rupture at the surface. Movement on the Port Hills Fault is believed to have extended to within 1 km to 2 km below ground surface.

Large regional areas of faulting (GNS, 2015) namely the Ashley Fault, Porters Pass - Amberley Fault Zone, and the Hope and Alpine Faults, are further afield but present a high seismic hazard to the Christchurch area due to the anticipated size of earthquakes generated. The largest of these faults is the Alpine Fault, which has a return period of 250 - 300 years and is expected to produce a M8 earthquake. The last rupture on the Alpine Fault is believed to have occurred in 1717 (Pettinga et al., 2001).

3.3.2 Liquefaction and Lateral Spreading

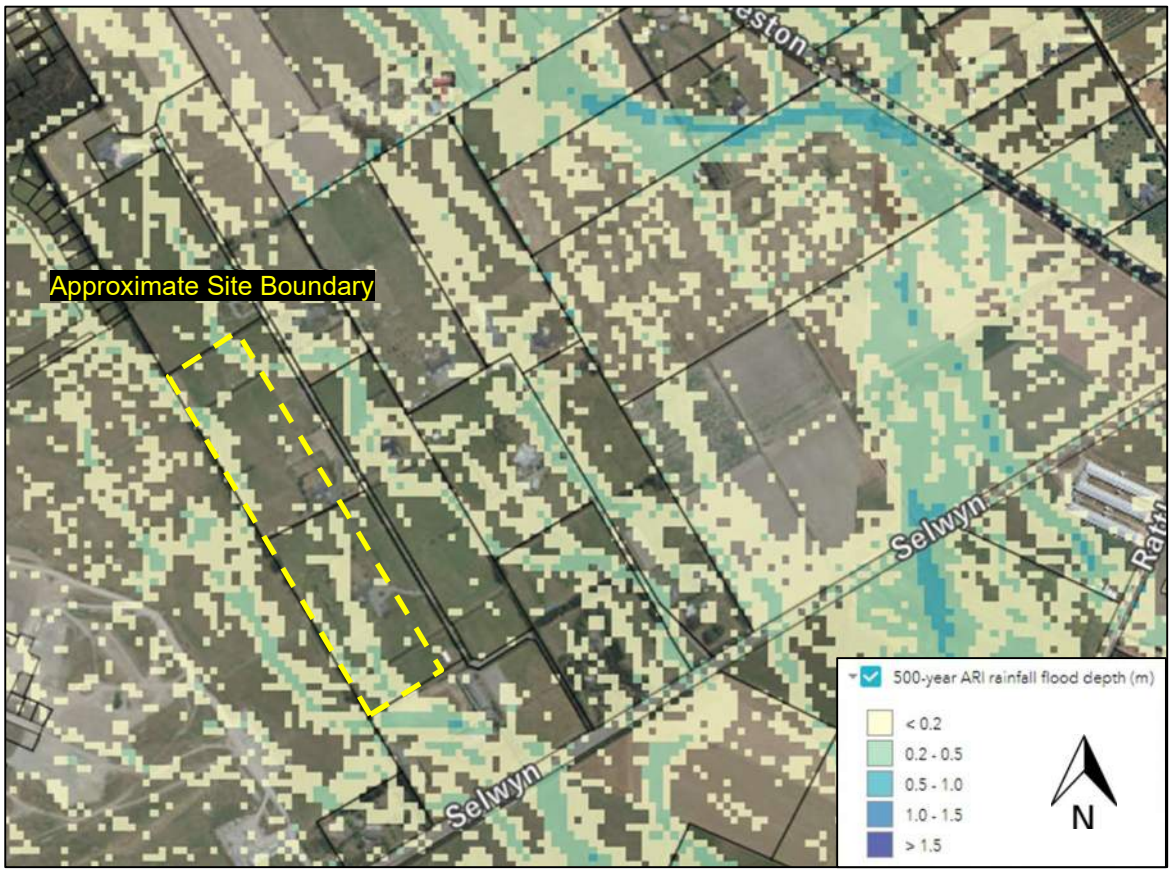
The site is located in an area mapped where “damaging liquefaction is unlikely” (NZGD Map CGD5140, 2012), and in a “zone of very low liquefaction potential” (GNS, 2006).

3.4 Flooding

The site is outside of any defined flood zones in the Selwyn District Council (SDC) Operative District Plan (SDC, 2015). The closest flood zone is the Lower Plains Flood Area which is approximately 4 km southeast of the site towards the Port Hills.

The Selwyn District Council have carried out computer-based flood modelling to predict the extent and depth of flooding that could happen during a one-in-200-year and a one-in-500-year flood. Based on this modelling, the water depth through the site may be up to 0.5 m deep but is generally less than 0.2 m (Figure 1) during the 500-year flood.

Figure 1: SDC Flooding map



From Canterbury Maps and Selwyn Council. Not to scale.

3.5 ECan Boreholes

We have reviewed deep ECan borehole logs located on the site (as shown in Figure 2) and have reviewed the monitoring well data from the monitoring wells on the site (part of the ECan Water Level Monitoring Network).

The logs for the wells located on the site, or close to the site boundary indicate the underlying soil generally comprises of gravels which extend to the bottom of the drill holes with isolated clay and silt layers at depth. The groundwater levels recorded in these wells are an average of approximately 10.6 m depth. The details for the wells are provided in Appendix 4 (including available drill logs).

Table 1: Generalised Summary of ECan Boreholes

ECan Borehole	Total Depth (m)	Initial Water Level Below Ground Level (m)	Generalised Borelog as Logged by Driller
M36_7975	37.5	10	Gravel to the maximum depth of testing with a 1 m thick silt layer from 25 m to 26 m depth.
M36_7976	36	10.2	Gravel to the maximum depth of drilling.
M36_8002	66	12.1	Gravel to the maximum depth of testing with 1 m thick clay layers from 26 m to 27 m depth and 32 m to 33 m.
M36_8009	36	11.8	Gravel to the maximum depth of drilling.
M36_8392	36	10	Gravel to the maximum depth of drilling.
Average Groundwater depth		10.8	

Figure 2: Nearby ECan Borehole Locations

Aerial photograph sourced from Canterbury Maps. Not to scale.

3.6 Groundwater

Groundwater is recorded in the surrounding ECan boreholes at approximately 10 to 11 m depth.

3.7 Site Investigation

As part of the plan change report dated December 2020, thee test pits were completed on, or near the site and an additional seven test pits and seven hand auger investigations were undertaken as part of this assessment by ENGEO on 2 June 2021. These were completed to a maximum depth of 2.6 m below ground level.

The investigations revealed subsurface conditions across the site are consistent with the published geological mapping, as summarised in Table 2. Hand auger and test pit logs are attached as Appendix 3 of this report.

Table 2: Summary of Subsurface Investigations

Soil Type	Depth to Top of Layer (m)	General Layer Thickness (m)	Density / Consistency	Additional Comments
TOPSOIL	0.0	0.25	-	-
Sandy GRAVEL	0.3	Unknown	Medium Dense to Very Dense	Tightly packed and consistent across the site. Thin (<0.4 m) silty SAND or SAND layers encountered in the initial 0.5 m (up to 0.9 m) in some test pit locations.

3.8 Site Seismic Class

In accordance with NZS 1170.5:2004, Class D applies to this particular site, defining it as a ‘deep soft soil site’.

4 Liquefaction Analysis

Owing to the nature of the subsurface materials and depth to groundwater at the site, we consider the potential for liquefaction and lateral spreading on the site to be very low.

We therefore consider future land performance to be in line with Technical Category 1 (TC1), whereby future land damage from liquefaction is unlikely, and ground settlements are expected to be within normally accepted tolerances.

5 RMA Section 106 Requirements and Suitability to Subdivide

Section 106 of the Resource Management Act 1991 states a consent authority may refuse to grant a subdivision consent, or may grant a consent subject to specific consent conditions if it considers that:

- There is a significant risk from natural hazards; or
- Sufficient provision has not been made for legal or physical access to each allotment to be created by the subdivision.

An assessment of the risk from natural hazards as required by the RMA includes the following:

- The likelihood of natural hazards occurring (whether individually or in combination);
- The material damage to land in respect of which the consent is sought, other land, or structures that would result from natural hazards; and
- Any likely subsequent use of the land in respect of which the consent is sought that would accelerate, worsen, or result in material damage of the kind referred to in paragraph (b).

We have assessed the risk of natural hazards at the site in accordance with Section 106 of the Resource Management Act (RMA) and considered the risk to the site from rockfall, inundation (debris), slope stability, subsidence, flooding and tsunami. Based on our observations and the nature of the site, its performance during the Canterbury Earthquake Sequence (CES), and the site's distance from the nearest significant watercourse, we consider it is unlikely for the site to be subject to natural hazards such as rockfall, inundation (debris), slope stability, subsidence and tsunami. As discussed in Section 3.4, we recommend that inundation hazard is considered during subdivision design. As such, the site is considered suitable for subdivision from a geotechnical perspective.

6 Geotechnical Recommendations

6.1 Earthworks

Earthworks carried out for the subdivision shall be in accordance with NZS 4404:2010, Land Development and Subdivision Infrastructure and NZS 4431:1989, Code of Practice for Earth filling for Residential Development. In particular, any areas to receive fill should be stripped of all vegetation, topsoil, non-engineered fill, soft or organic soils prior to fill placement.

Fill may comprise clean native sandy gravel or silty soils, or clean imported soils and / or granular fill, compacted to achieve no less than 95% of maximum dry density. Fill faces steeper than 2H:1V and higher than 600 mm should be retained and referred back to ENGEO. Although unlikely, where any springs or groundwater seeps are encountered, they should be intercepted with suitable drainage and discharged to a Council approved outlet.

All unretained batters of pond and stormwater drains constructed with the native sandy gravel material should be at an inclination no steeper than 1V:3H, with protection schemes in place to control erosion of the formed batters within the waterways.

A comprehensive earthworks specification should be provided to the earthworks contractor prior to starting excavations and an inspection / testing regime agreed, along with a robust erosion and sediment control plan.

6.2 Subdivision Roading

Vegetation, any organic or deleterious material, topsoil and non-engineered fill should be removed from under pavement areas prior to aggregate placement. Based on our observations during testing, we consider the native ground below the topsoil at the site should provide an adequate subgrade for the proposed pavement areas.

6.3 Stormwater Control

Concentrated stormwater flows from all impermeable areas must be collected and carried in sealed pipes to the Council system or an alternative disposal point subject to approval from Council. Uncontrolled stormwater must not be allowed to saturate the ground as this will potentially affect future foundation performance both statically and during future seismic activity.

6.4 Foundations

Foundations for future proposed residential dwellings within the subdivision may comprise shallow pad, strip, or slab foundations designed in accordance with the provisions of NZS 3604 Timber Framed Buildings.

Site specific testing will be required for Building Consent, to confirm the bearing materials and capacity. For preliminary design, we anticipate that a geotechnical Ultimate Bearing Capacity of 300 kPa may be assumed for foundations bearing on sandy gravel or engineered fill, below any topsoil. All topsoil shall be stripped from within building footprints; we anticipate this to be typically below 0.3 m depth based on our subsurface investigations.

7 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Broadfield Grange Limited, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface 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.

iv. This Limitation should be read in conjunction with the Engineering NZ / ACENZ Standard Terms of Engagement.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (03) 328 9012 if you require any further information.

Report prepared by

Jed Watts

Engineering Geologist

Report reviewed by

Don Bruggers, CMEngNZ (CPEng)

Principal Engineer

8 References

Canterbury Maps, Groundwater. Retrieved June 2022 from http://canterburymaps.govt.nz/Viewer.

Forsyth, P., Barrell, D. J., & Jongens, R. (2008). Sheet 16 - Geology of the Christchurch Area 1:250,000. Lower Hutt: Institute of Geological and Nuclear Sciences.

New Zealand Geotechnical Database (NZGD). Retrieved June 2022 from https://www.nzgd.org.nz/

Selwyn District Council (2015), Selwyn District Council Operative District Plan. Retrieved December 2020, from http://www.selwyn.govt.nz/services/planning/district-plan.

Selwyn District Council (2015), Property Search. Retrieved June 2022, from https://www.selwyn.govt.nz/my-property/rates/search-properties.

The Ministry of Business, Innovation, and Employment. (2012). Guidance-Repairing and rebuilding houses affected by the Canterbury earthquakes. Christchurch: The Ministry of Business, Innovation, and Employment.

We also acknowledge the New Zealand GeoNet project and its sponsors EQC, GNS Science and LINZ, for providing data used in this report.

APPENDIX 1:

Development Plan

AMENDMENTS :		
AMENDMENT	DATE	DESCRIPTION

NOTES :

1. Areas and dimensions are approximate only and are subject to final survey and deposit of plans.
2. Service easements to be created as required.
3. This plan has been prepared for consent purposes only. No liability is accepted if the plan is used for any other purposes.

NORTH

STAGE 1

STAGE 2

STAGE 3

1000 0.3876 ha Road to Vest in SDC

2000 2.0690 ha BALANCE LOT

1001 0.9116 ha Road to Vest in SDC

200 259m² Recreation Reserve to vest in SDC

LADY ISSAC DRIVE

TE KANAWA LANE

LOVELOCK AVENUE

Lot 6 DP 337894

Lot 410 DP 555938

Lot 409 DP 555938

Lot 408 DP 555938

Lot 407 DP 555938

Lot 406 DP 555938

Lot 421 DP 559521

Lot 422 DP 559521

Lot 423 DP 559521

Lot 424 DP 559521

Lot 425 DP 559521

Lot 426 DP 559521

Lot 427 DP 559521

Lot 428 DP 559521

Lot 1322 DP 559521

Lot 523 DP 559521

Lot 524 DP 559521

Lot 525 DP 559521

Lot 526 DP 559521

Lot 527 DP 559521

Lot 528 DP 559521

Lot 537 DP 559521

Lot 539 DP 559521

Lot 540 DP 559521

Lot 541 DP 559521

Lot 542 DP 559521

Lot 4 DP 337894 RT 155853

Lot 2 DP 337894 RT 155851

Lot 3 DP 337894

Lot 1 DP 337894

Lot 45 DP 547617

Proposed Memorandum of Easements			
Nature	Servient Tenement (Burdened Land)		Dominant Tenement (Benefited Land)
	Lot No	Shown	
Right of way, rights to drain water & sewage & rights to convey gas, water, electricity & telecommunications.	61	A	LOTS 62 - 66
	62	B	LOTS 61, 63 - 66
	63	C	LOTS 61, 62, 64 - 66
	64	D	LOTS 61 - 63, 65, 66
	65	E	LOTS 61 - 64, 66
	66	F	LOTS 61 - 65
	85	G	LOT 84
	84	H	LOT 85
	38	I	LOT 39
	39	J	LOT 38
	101	K	LOT 100
	100	L	LOT 101
	97	M	LOT 96
	96	N	LOT 97

Total Area : 5.9484ha

Comprised in: RT's 155851 & 155853

Schedule of Areas	
Description	Area
Residential Lots - (Lots 1-7, 20-46, 53-66, 79-105)	4.6233ha
Balance Lot - (Lot 2000)	2.069ha
Recreation Reserve to vest in selwyn District Council - (Lot 200)	259m²
Road to vest in Selwyn District Council - (Lots 1000-1001)	1.2992ha

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

116 Wrights Road P O Box 679 Christchurch 8140. New Zealand
Telephone: 03 379-0793 Website: www.dls.co.nz E-mail: office@dls.co.nz

JOB TITLE:
Broadfield Grange Limited
East Rolleston PHASE I

SHEET TITLE:
Proposed Subdivision of Lot 2 & 4 DP 337894

DRAWING STATUS
For Consent Purposes

SCALE : 1:750@A1 1:1500@A3 DATE : May 2022

CAD FILE : J:\20654\SUBCON\E20654_STG 1-3_Subcon R0.dwg DRAWN : JS

DRAWING No : **E20654** SHEET No: 1 OF 1 REVISION : **R0**

APPENDIX 2:

ENGEO Southeast Rolleston Geotechnical Investigation

ENGEO

Celebrating 10 YEARS IN NZ

Geotechnical Investigation

Multiple Sites

Southeast Rolleston

Submitted to:

Urban Estates Ltd
181 High Street
City Centre
Christchurch 8144

ENGEO Limited
124 Montreal Street, Sydenham, Christchurch 8023
PO Box 373, Christchurch 8140, New Zealand
Tel +64 3 328 9012 Fax +64 3 328 9013
www.engeo.co.nz

09.12.2020
18113.000.001_03

ACENZ

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Appendix 1: Site Plan

Appendix 2: TP Logs

Appendix 3: Ecan Boreholes

ENGEO Document Control:

Report Title	Geotechnical Investigation - Multiple Sites, Southeast Rolleston			
Project No.	18113.000.001	Doc ID	03	
Client	Urban Estates Ltd	Client Contact	Justin McDonald, Brad Wilson (Urban Estates)	
Distribution (PDF)	Justin McDonald, Brad Wilson (Urban Estates)			
Date	Revision Details/Status	WP	Author	Reviewer
09/12/2020	Issued to Client	DF	JRW	NC

1 Introduction

ENGEO Ltd was requested by Urban Estates Ltd to undertake a geotechnical investigation of several properties (herein referred to as 'the site'). This work has been carried out in accordance with our signed agreement dated 18 August 2020.

We understand that you propose to apply for a plan change for this site to allow proposed zone change from general rural zone to general residential zone with an approximate density of 12 lots per hectare. Our scope of works at this stage will support your Resource Consent application for the plan change only. We can complete additional testing to support a subdivision consent application at a later date.

Our scope of works included the following:

- Review of published geotechnical and geological information relevant to the site;
- Site assessment by an experienced ground engineering professional;
- Coordinate local buried services location contractor;
- Shallow subsurface testing, consisting of approximately 0.3 tests (test pits) per hectare*, with a total of approximately 18 test pits; These pits will be up to approximately 2 m deep, 3 m long and 1 m wide. We will loosely backfill the test pits upon completion with the excavated soil. Re-compaction will be accomplished by tamping with the excavator bucket.
- Assess the liquefaction potential for the site based on our site investigations and published literature;
- Prepare a report outlining our findings on the ground conditions and the suitability of the site for residential subdivision. This will include:
    - Foundation recommendations for typical timber framed residential dwellings.
    - Seismic Subsoil category;
    - Address likely geohazards that may affect the site; and
    - Provide general geotechnical recommendations related to the proposed development.

Our scope of works does not include geotechnical recommendations to a level suitable for subdivision consent, foundation design or Building Consent.

2 Site Description

The 63 ha site is located on a relatively flat area in Rolleston and made up of the following addresses (Appendix 1):

- 127 Lincoln Rolleston Road
- 391 Lincoln Rolleston Road
- 548 Selwyn Road

- 2/554 Selwyn Road
- 3/554 Selwyn Road
- 1/554 Selwyn Road
- 1/572 Selwyn Road (Lot 2 DP 337894)
- 2/572 Selwyn Road (Lot 3 DP 337894)
- 4/572 Selwyn Road (Lot 4 DP 337894)
- 5/572 Selwyn Road (Lot 5 DP 337894)
- 6/572 Selwyn Road (Lot 6 DP 337894)
- 582 Selwyn Road (Lot 1 DP 337894)

The site is currently lifestyle blocks mostly used for light grazing. There are various existing dwellings and sheds on-site.

3 Geological Model

3.1 Regional Geology

The site has been regionally mapped by GNS (Forsyth et al., 2008) as being underlain by brownish grey river alluvium (Q2a).

3.2 Geomorphology

The site comprises relatively flat ground, with gentle undulations and depressions in some areas. As evident on aerial imagery (Canterbury Maps, 2020) and observed during our site walkover conducted on 2 December 2020, a number of areas of undulating and depressed ground can be attributed to paleo-channels, which traverse the site in a general northwest to southeast direction. Based on observations, sandy silt deposits with variable thickness are expected to have in-filled the paleo-channels where they have not remained as channel features.

3.3 Geohazards

3.3.1 Seismicity

There are no known or mapped faults in the immediate area of the site, however, the site may be at risk of ground shaking induced by movement of other faults.

The site is located between two recently discovered fault systems, the Greendale Fault and the Port Hills Fault, the ruptures of which initiated the ongoing Canterbury Earthquake Sequence (CES). The Greendale Fault has been mapped approximately 6 km northwest of the site and trends roughly east-west with a surface rupture of approximately 28 km (GNS, 2015), while the Port Hills Fault remains unmapped as the fault did not rupture the surface. Movement on the Port Hills Fault is believed to have occurred at a depth of 1 km to 2 km below the ground surface.

Large regional areas of faulting (GNS, 2015) namely the Ashley Fault, Porters Pass-Amberley Fault Zone, and the Hope and Alpine Faults, are further afield but present a high seismic hazard to the Christchurch area due to the anticipated size of earthquakes generated. The largest of these faults is the Alpine Fault, which has a return period of 250-300 years and is expected to produce a M8 earthquake. The last rupture on the Alpine Fault is believed to have occurred in 1717 (Pettinga et al., 2001).

3.3.2 Liquefaction and Lateral Spreading

The site is located in an area mapped where “damaging liquefaction is unlikely” (NZGD Map CGD5140, 2012), and a “zone of very low liquefaction potential” (GNS, 2006).

3.4 Flooding

The site is outside of any defined flood zones in the Selwyn District Council (SDC) Operative District Plan (SDC, 2015). The closest flood zone is the Lower Plains Flood Area which is approximately 4 km southeast of the site towards the Port Hills.

The Selwyn District Council have carried out computer-based flood modelling to predict the extent and depth of flooding that could happen during a one-in-200-year and a one-in-500-year flood. Based on this modelling, the water depth through the site may be up to 0.8 m deep in the existing channel feature (Figure 1) during the 500 year flood.

Figure 1: SDC Flooding map

From Canterbury Maps and Selwyn Council. Not to scale.

3.5 ECan Boreholes

We have reviewed deep ECan borehole logs located on the site (as shown in *Excluded from the average as an outlier.

Figure 2), and have reviewed the monitoring well data from the monitoring wells on the site (part of the ECan Water Level Monitoring Network).

The logs for the wells located on the site, or close to the site boundary indicate the underlying soil generally comprises of gravels which extend to the bottom of the drill holes with isolated clay and silt layers at depth. The groundwater levels recorded in these wells are an average of approximately 10.6 m depth. The details for the wells are provided in Appendix 3 (including available drill logs).

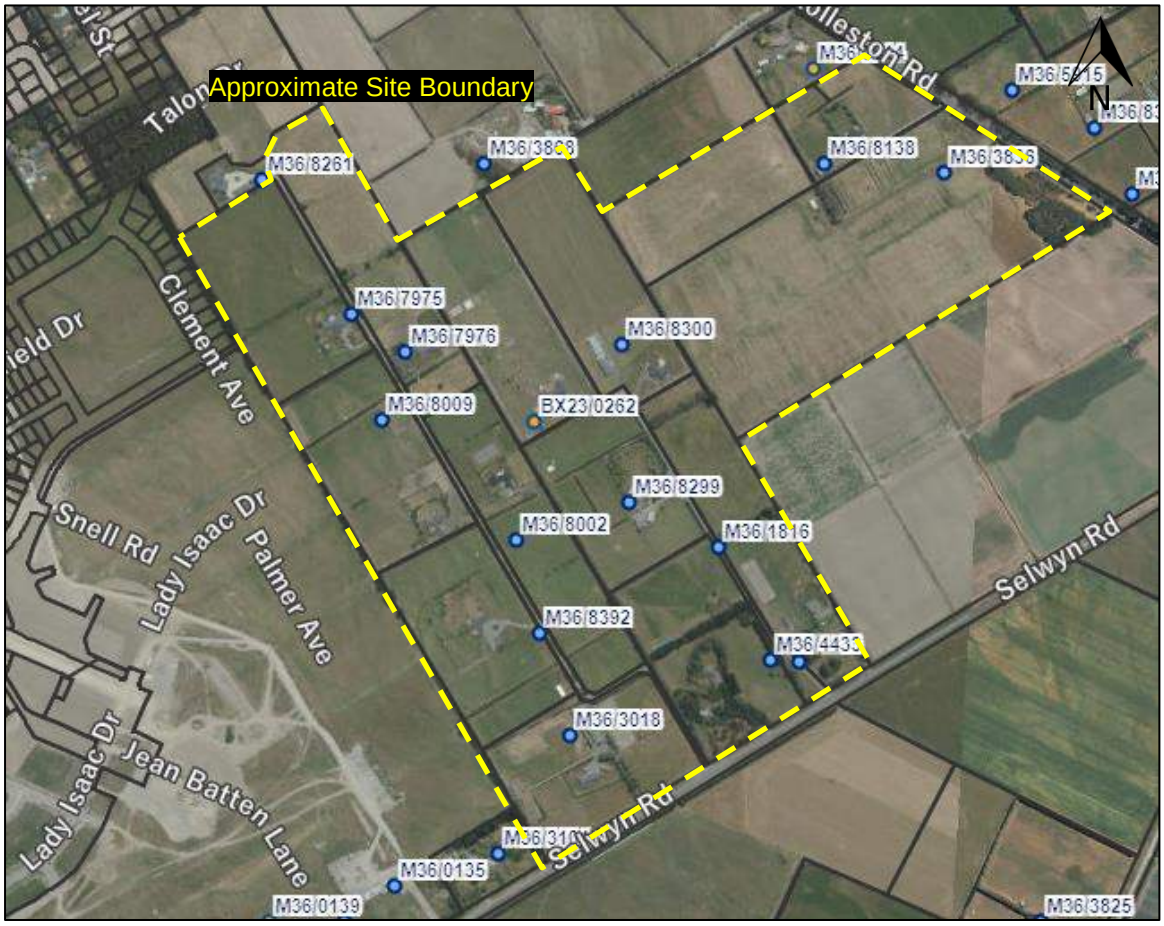
Table 1: Generalised Summary of ECan Boreholes

ECan Borehole	Total Depth (m)	Initial Water Level Below Ground Level (m)	Generalised Borelog as Logged by Driller
M36/4015	28	10.5	Gravel to 28.3 m depth.
M36/7850	42	12.2	Gravel to 42 m depth.
BX23_0262	42	7.3	Gravel to the maximum depth of testing with a 3 m thick clay layer from 26 m to 29 m depth.
M36_1816	13.67	7.64	No data available.
M36_2996	59.4	9.6	No data available.
M26_3018	65.7	9.32	Not logged up to 39 m depth. Gravel from 39 m to 65.7 m depth.
M36_3836	56.6	10.7	Gravel to the maximum depth of drilling.
M36_4433	30	9.7	Gravel to the maximum depth of testing with a 1 m thick clay layer from 26 m to 27 m depth.
M36_7975	37.5	10	Gravel to the maximum depth of testing with a 1 m thick silt layer from 25 m to 26 m depth.
M36_7976	36	10.2	Gravel to the maximum depth of drilling.
M36_8002	66	12.1	Gravel to the maximum depth of testing with 1 m thick clay layers from 26 m to 27 m depth and 32 m to 33 m.
M36_8009	36	11.8	Gravel to the maximum depth of drilling.

ECan Borehole	Total Depth (m)	Initial Water Level Below Ground Level (m)	Generalised Borelog as Logged by Driller
M36_8138	36	14.2	Gravel to the maximum depth of drilling.
M36_8299	90	20.4*	Gravel to the maximum depth of drilling with a 6 m layer of river sands with some clay from 8 m to 14 m depth.
M36_8300	42	13.4	Gravel to the maximum depth of drilling.
M36_8392	36	10	Gravel to the maximum depth of drilling
Average Groundwater depth		10.6	

*Excluded from the average as an outlier.

Figure 2: Nearby ECan Borehole Locations



Aerial photograph sourced from Canterbury Maps. Not to scale.

3.6 Site Seismic Class

In accordance with NZS 1170.5:2004, Class D applies to this particular site, defining it as a 'deep soft soil site'.

4 Site Investigation

4.1 Site Investigation

Site investigations to assess the shallow subsurface material types and strength characteristics were undertaken by ENGEO on 3 and 4 December 2020. Eighteen test pits with associated Scala penetrometer tests were completed to a maximum depth of 2.2 m below ground level.

The investigations revealed subsurface conditions across the site are consistent with the published geological mapping, as summarised in Table 2. Hand auger and test pit logs are attached as Appendix 2 of this report.

Table 2: Summary of Subsurface Investigations

Soil Type	Depth to Top of Layer (m)	General Layer Thickness (m)	Density / Consistency	Additional Comments
TOPSOIL	0.0	0.3	-	-
SILT / SAND*	0.3	0.5**	Very Stiff to Hard / Medium Dense	-
Sandy GRAVEL	0.3	Unknown	Medium Dense to Very Dense	Tightly packed and consistent across the site. Deep roots observed up to 2 m depth.

*Not observed in all test pit locations.

**Thickness varies.

5 Geotechnical Assessment

5.1 Site Seismic Class

For the purpose of seismic design, we consider the soil classification in line with NZS 1170.5:2004 to be 'Class D – Deep or soft soil sites'

5.2 Liquefaction Assessment

Owing to the nature of the subsurface materials and depth to groundwater at the site, we consider the potential for liquefaction and lateral spreading on the site to be very low.

We therefore consider future land performance to be in line with Technical Category 1 (TC1), whereby future land damage from liquefaction is unlikely, and ground settlements are expected to be within normally accepted tolerances.

5.3 Foundations

Foundations for future one or two storey residential dwellings within the subdivision are likely to comprise pad, strip or slab foundations designed in accordance with the provisions of NZS 3604 Timber Framed Buildings. In areas where native gravel is < 400 mm of the surface, it is likely that standard 3604 foundations will be suitable. In areas where foundations are native on alluvial silt or sand, standard foundations will likely be suitable however engineering judgement may be required to design the foundations to accommodate for a reduced bearing capacity. This should be confirmed by lot specific reporting completed during the building consent process.

6 RMA Section 106 Assessment

Section 106 of the Resource Management Act 1991 states a consent authority may refuse to grant subdivision consent, or may grant a consent subject to specific consent conditions if the land is likely to be subject to the following:

- Erosion, including surface and subsurface erosion, associated with water and wind;
- Falling debris, including rockfall that could impact the site from upslope sources;
- Subsidence, which involves the removal of underlying support by natural or artificial means;
- Slippage, which is defined as the downslope transfer of materials by sliding and / or flowage; and
- Inundation, which may be sourced from streams, coastal processes or excess precipitation.

Based on our observations and the nature of the site, and the site's distance from the nearest significant watercourse, we consider it unlikely for the site to be subject to any of the above hazards and, as such, the site is considered suitable for a plan change from a geotechnical perspective. As discussed in Section 3.3 of this report, we recommend that flooding hazard is considered during subdivision design.

7 References

Canterbury Maps, Groundwater. Retrieved December 2020 from http://canterburymaps.govt.nz/Viewer.

Forsyth, P., Barrell, D. J., & Jongens, R. (2008). Sheet 16 - Geology of the Christchurch Area 1:250,000. Lower Hutt: Institute of Geological and Nuclear Sciences.

New Zealand Geotechnical Database (NZGD). Retrieved December 2020 from https://www.nzgd.org.nz/

Selwyn District Council (2015), Selwyn District Council Operative District Plan. Retrieved December 2020, from http://www.selwyn.govt.nz/services/planning/district-plan.

Selwyn District Council (2015), Property Search. Retrieved December 2020, from https://www.selwyn.govt.nz/my-property/rates/search-properties.

The Ministry of Business, Innovation, and Employment. (2012). Guidance-Repairing and rebuilding houses affected by the Canterbury earthquakes. Christchurch: The Ministry of Business, Innovation, and Employment.

We also acknowledge the New Zealand GeoNet project and its sponsors EQC, GNS Science and LINZ, for providing data used in this report.

8 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Urban Estates Ltd, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface 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.

iv. This Limitation should be read in conjunction with the Engineering NZ/ACENZ Standard Terms of Engagement.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (03) 328 9012 if you require any further information.

Report prepared by

Jed Watts

Engineering Geologist

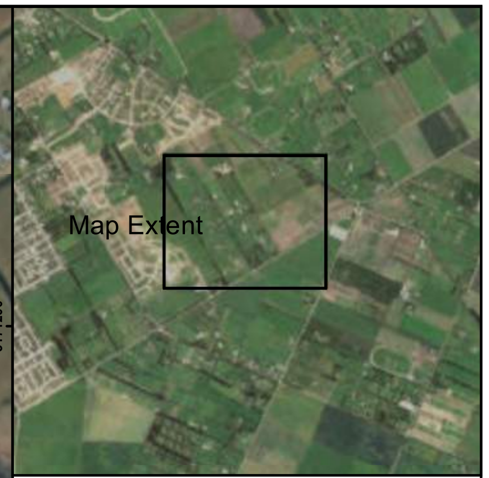
Report reviewed by

Neil Charters, CMEngNZ (CPEng)

Principal Geotechnical Engineer

APPENDIX 1:

Site Plan



Legend

Test Pit

Site boundary

Aerial: LINZ and Eagle Technology, CC BY 4.0.
Map image: Eagle Technology.

0 50 100 Metres

PROJECTION: NZGD 2000 New Zealand Transverse Mercator

ENGEO

Christchurch Office
124 Montreal Street Sydenham, Christchurch 8023
Tel: 03 328 9012, www.engeo.co.nz

Title: Geotech Location Plan			
Client: Urban Estates Limited			Figure No: 2
Project: Site 2 Rolleston	Designed: NF		
	Drawn: RS		
	Checked: JRW		
	Date: Dec 20		Size: A3
Proj No: 18113.00.001	Scale: 1:4,000		Revision: A

ORIGINAL FIGURE PRINTED IN COLOUR

DATE PLOTTED: 09 December 2020 9:39:33 AM BY: rsweetapple

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APPENDIX 2:

TP Logs

LOG OF TEST PIT TP01

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 3/12/2020
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No :
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.611992
Longitude : 172.408565

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier – Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TOPSOIL		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand is fine to medium [TOPSOIL].				D	N/A		
0.5	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles and trace rootlets; greyish brown. Well graded. Gravel subangular to subrounded. Sand fine to coarse, well graded. Rootlets were not observed from 0.8 m.				M	D Tightly Packed		
1.0											
1.5											
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Test pit met target depth at 2 m.
Scala Penetrometer met practical refusal at 0.5 m depth.
Standing groundwater was not encountered

GEOTECH TEST PIT LOG ROLLESTON MEGASITE - TP01 - 09.GPJ NZ MASTER DATA TEMPLATE.GDT 7/12/20

LOG OF TEST PIT TP02

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 3/12/2020
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No :
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.610429
Longitude : 172.408787

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TOPSOIL		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand is fine to medium [TOPSOIL].					N/A		
			ML	SILT with minor sand and rootlets; light brown with orange mottles. Sand is fine. Low plasticity.				D	H VSt		
0.5	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles; greyish brown. Well graded. Gravel subangular to subrounded. Sand fine to coarse, well graded.				M	D Tightly Packed		
1.0											
1.5											
2.0				Depth of Excavation: 2 m Termination Condition: Target depth				W			

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 (>> at 0.6 m)

Test pit met target depth at 2 m.
Scala Penetrometer met practical refusal at 0.6 m depth.
Standing groundwater was not encountered

LOG OF TEST PIT TP03

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 3/12/2020
Max Test Pit Depth : 2.2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No :
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.613335
Longitude : 172.408111

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier – Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TOPSOIL		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand is fine to medium [TOPSOIL].				D	N/A		
0.4	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles and rootlets; greyish brown. Well graded. Gravel subangular to subrounded. Sand fine to coarse, well graded. Rootlets were not observed from 0.55 m.				D M	D Tightly Packed		2 4 6 8 10 12 >>
2.2				Depth of Excavation: 2.2 m Termination Condition: Target depth							

Test pit met target depth at 2.2 m.
Scala Penetrometer met practical refusal at 0.4 m depth.
Standing groundwater was not encountered

GEOTECH TEST PIT LOG ROLLESTON MEGASITE - TP01 - 09.GPJ NZ MASTER DATA TEMPLATE.GDT 7/12/20

LOG OF TEST PIT TP04

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 3/12/2020
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No :
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.613667
Longitude : 172.411393

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier – Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TOPSOIL		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand is fine to medium [TOPSOIL].					N/A		
0.3			ML	SILT with minor sand and rootlets; light brown with orange mottles. Sand is fine to medium. Low plasticity.				D	VSt / H		
0.5	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles and trace rootlets; greyish brown. Well graded. Gravel subangular to subrounded. Sand fine to coarse, well graded. Rootlets were not observed from 1.1 m.				M	Tightly Packed		
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 (>>)

Test pit met target depth at 2 m.
Scala Penetrometer met practical refusal at 0.6 m depth.
Standing groundwater was not encountered

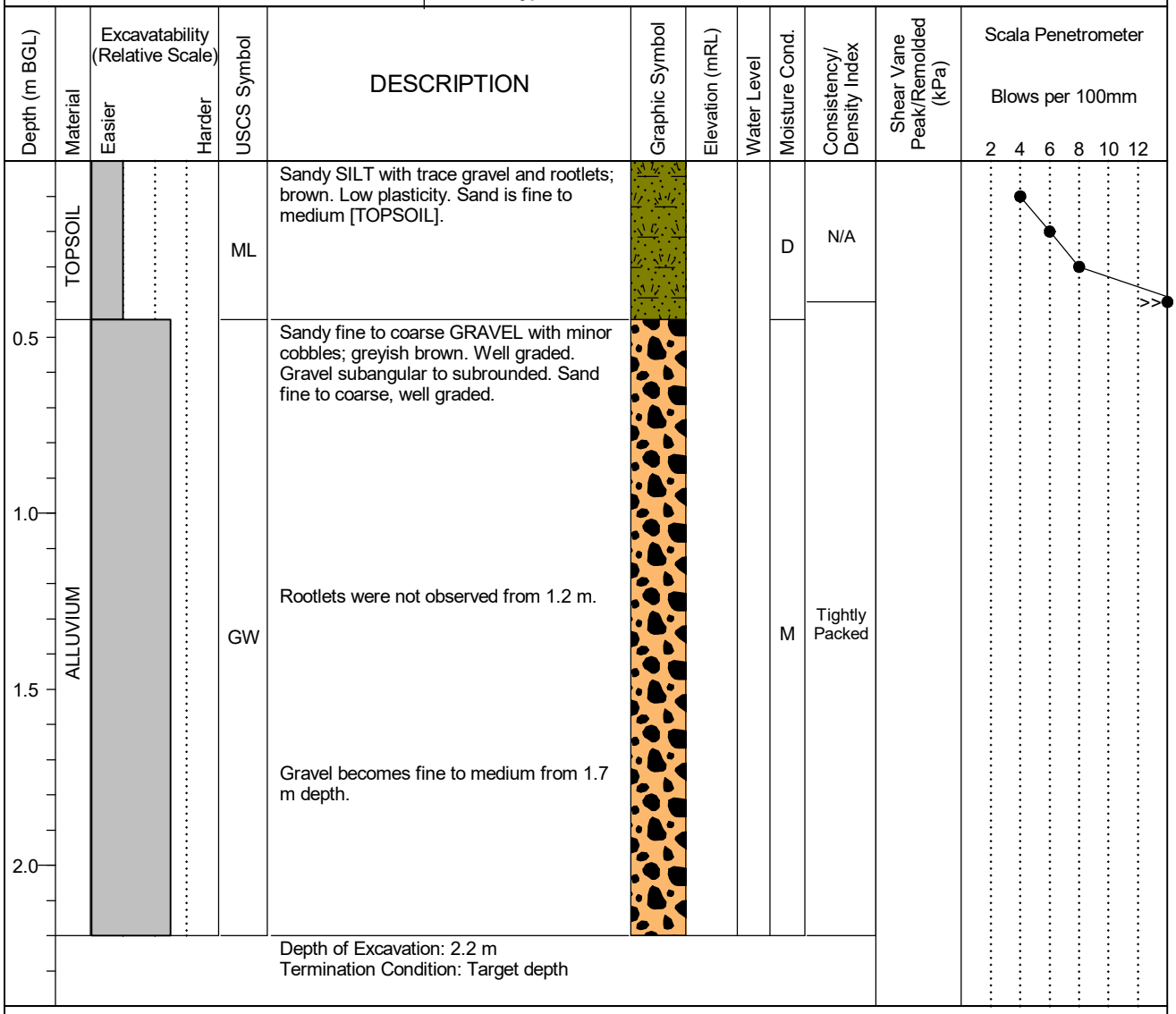
GEOTECH TEST PIT LOG ROLLESTON MEGASITE - TP01 - 09.GPJ NZ MASTER DATA TEMPLATE.GDT 7/12/20

LOG OF TEST PIT TP05

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 3/12/2020
Max Test Pit Depth : 2.2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No :
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.614262
Longitude : 172.410054



Depth of Excavation: 2.2 m
Termination Condition: Target depth

Test pit met target depth at 2.2 m.
Scala Penetrometer met practical refusal at 0.4 m depth.
Standing groundwater was not encountered

GEOTECH TEST PIT LOG ROLLESTON MEGASITE - TP01 - 09.GPJ NZ MASTER DATA TEMPLATE.GDT 7/12/20

LOG OF TEST PIT TP06

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 3/12/2020
Max Test Pit Depth : 2.2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No :
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.616713
Longitude : 172.411568

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0	TOPSOIL		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand is fine to medium [TOPSOIL].					N/A		
0.5	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles and trace rootlets; greyish brown. Well graded. Gravel subangular to subrounded. Sand fine to coarse, well graded.				D	D		
1.0				No rootlets from 0.8 m to 1.6 m.					Tightly Packed		
1.5				Minor rootlets encountered from 1.6 m depth.				M			
2.0				Depth of Excavation: 2.2 m Termination Condition: Target depth							

Test pit met target depth at 2.2 m.
Scala Penetrometer met practical refusal at 0.4 m depth.
Standing groundwater was not encountered

GEOTECH TEST PIT LOG ROLLESTON MEGASITE - TP01 - 09.GPJ NZ MASTER DATA TEMPLATE.GDT 7/12/20

LOG OF TEST PIT TP07

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 3/12/2020
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No :
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.617708
Longitude : 172.41176

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier – Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TOPSOIL		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand is fine to medium [TOPSOIL].					N/A		
0.3			ML	SILT with some sand and trace rootlets; light brown. Sand is fine to medium. Low plasticity.				D	F		
0.5									St - VSt		
0.7	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles and trace rootlets; greyish brown. Well graded. Gravel subangular to subrounded. Sand fine to coarse, well graded. Rootlets were not observed from 0.75 m.					D		
1.0								M	Tightly Packed		
1.5											
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 (>> at 12)

Test pit met target depth at 2 m.
Scala Penetrometer met practical refusal at 0.7 m depth.
Standing groundwater was not encountered

LOG OF TEST PIT TP08

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 3/12/2020
Max Test Pit Depth : 2.1 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No :
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.61702
Longitude : 172.414053

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm (2 4 6 8 10 12)
0.0	TOPSOIL		ML	Sandy SILT with minor gravel and rootlets; brown. Low plasticity. Sand is fine to medium [TOPSOIL].					N/A		>>
0.5	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles and trace rootlets; greyish brown. Well graded. Gravel subangular to subrounded. Sand fine to coarse, well graded. Rootlets were not observed from 0.75 m.				D / M	Tightly Packed		
1.0											
1.5											
2.0				Depth of Excavation: 2.1 m Termination Condition: Target depth							

Test pit met target depth at 2.1 m.
Scala Penetrometer met practical refusal at 0.2 m depth.
Standing groundwater was not encountered

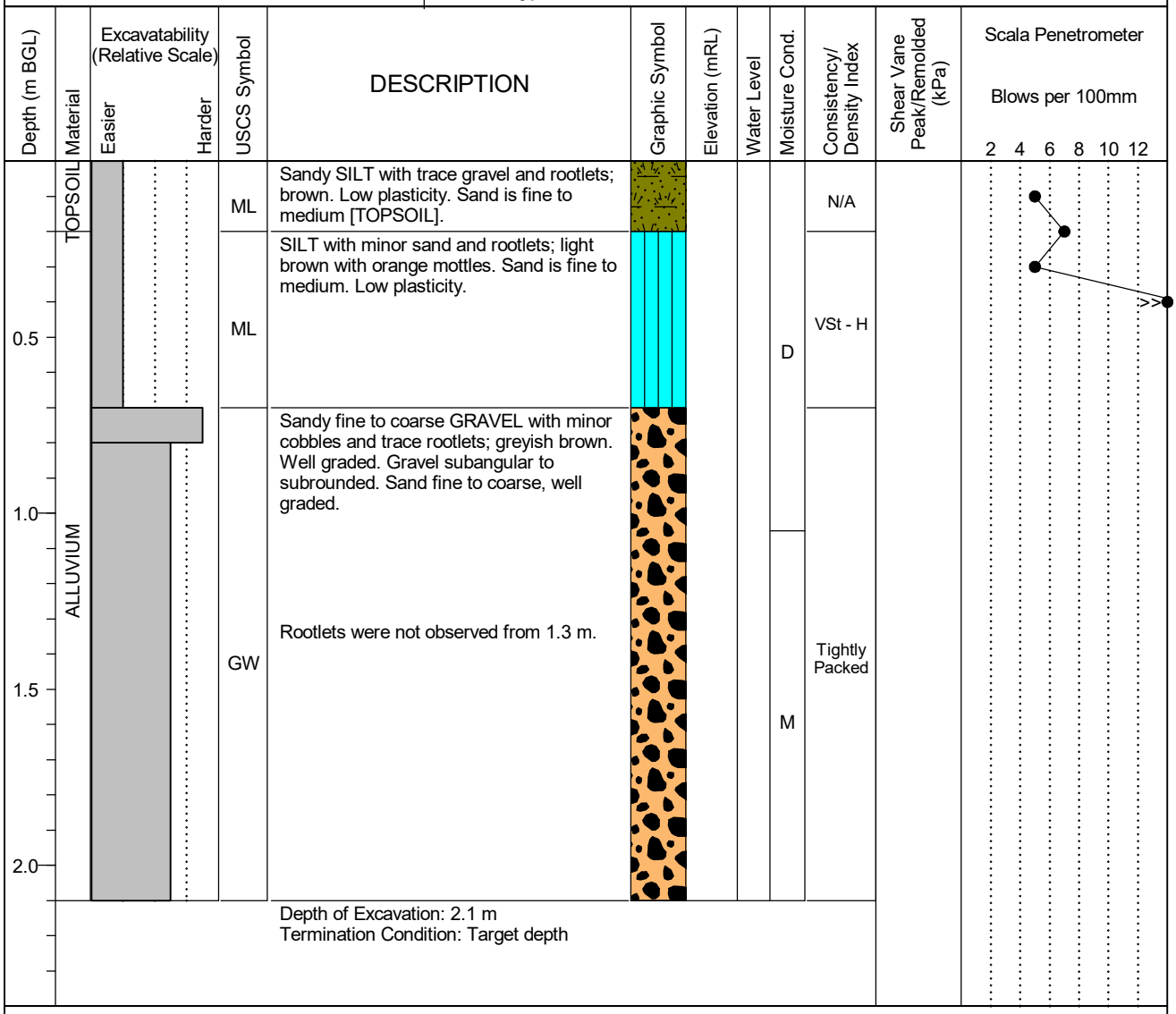
GEOTECH TEST PIT LOG ROLLESTON MEGASITE - TP01 - 09.GPJ NZ MASTER DATA TEMPLATE.GDT 7/12/20

LOG OF TEST PIT TP09

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 3/12/2020
Max Test Pit Depth : 2.1 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No :
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.611618
Longitude : 172.410134



Test pit met target depth at 2.1 m.
Scala Penetrometer met practical refusal at 0.4 m depth.
Standing groundwater was not encountered

LOG OF TEST PIT TP10

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 03/12/2020
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No : N/A
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.614022
Longitude : 172.411991

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier – Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TS		ML	Sandy SILT with trace rootlets; brown. Low plasticity. Sand fine to medium [TOPSOIL].					N/A		
	ALLUVIUM		ML	SILT with some fine to medium sand and trace rootlets; light brown. Low plasticity.					St - VSt		
0.5									VSt - H		
			GW	Sandy fine to coarse GRAVEL with minor cobbles and trace rootlets; greyish brown. Well graded, rounded to sub-angular. Sand fine to coarse, well graded. Trace rootlets no longer present at 0.9 m depth.				D	Tightly Packed		
1.0											
1.5								M			
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Test pit reached target depth at 2 m.
Scala Penetrometer met practical refusal at 0.5 m depth.
Standing groundwater was not encountered

GEOTECH TEST PIT LOG ROLLESTON_TP_10_TO_18.GPJ NZ MASTER DATA TEMPLATE.GDT 7/12/20

LOG OF TEST PIT TP11

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 03/12/2020
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No : N/A
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.612378
Longitude : 172.413979

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TS		ML	Sandy SILT with trace rootlets; brown. Low plasticity. Sand fine to medium [TOPSOIL].					N/A		
0.5	ALLUVIUM		ML	SILT with some fine to medium sand and trace rootlets; light brown. Low plasticity.				M	St - VSt		
1.0			GW	Sandy fine to coarse GRAVEL with minor cobbles and trace rootlets; greyish brown. Well graded, rounded to sub-angular. Sand fine to coarse, well graded. Trace rootlets no longer present at 1.0 m depth.				W	D Tightly Packed		
1.5											
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12

Test pit reached target depth at 2 m.
Scala Penetrometer met practical refusal at 0.8 m depth.
Standing groundwater was not encountered

LOG OF TEST PIT TP12

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 03/12/2020
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No : N/A
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.615236
Longitude : 172.412995

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier – Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm (2 4 6 8 10 12)
0.0	TS		ML	Sandy SILT with trace rootlets; brown. Low plasticity. Sand fine to medium [TOPSOIL].					N/A		
	ALLUVIUM		ML	SILT with some fine to medium sand and trace rootlets; light brown. Low plasticity.					VSt - H		
0.5			GW	Sandy fine to coarse GRAVEL with minor cobbles and trace rootlets; greyish brown. Well graded, rounded to sub-angular. Sand fine to coarse, well graded.				D	Tightly Packed		
1.0											
1.5				Trace rootlets no longer present at 1.4 m depth.				M			
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Test pit reached target depth at 2 m.
Scala Penetrometer met practical refusal at 0.4 m depth.
Standing groundwater was not encountered

LOG OF TEST PIT TP13

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 03/12/2020
Max Test Pit Depth : 1.8 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No : N/A
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.616271
Longitude : 172.416113

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TS		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand fine to medium [TOPSOIL].					N/A		
0.5	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles and trace rootlets; greyish brown. Well graded, rounded to sub-angular. Sand fine to coarse, well graded.				D	Tightly Packed		
1.0				Trace rootlets no longer present at 0.85 m depth.				M			
1.5											
2.0				Depth of Excavation: 1.8 m Termination Condition: Target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12

Test pit reached target depth at 1.8 m.
Scala Penetrometer met practical refusal at 0.2 m depth.
Standing groundwater was not encountered

GEOTECH TEST PIT LOG ROLLESTON_TP_10_TO_18.GPJ NZ MASTER DATA TEMPLATE.GDT 7/12/20

LOG OF TEST PIT TP14

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 04/12/2020
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No : N/A
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.610817
Longitude : 172.41651

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier – Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TOPSOIL		ML	Sandy SILT with trace rootlets; brown. Low plasticity. Sand fine to medium [TOPSOIL].					N/A		6 → >>
0.5	ALLUVIUM		ML	SILT with some fine to medium sand and trace rootlets; light brown. Low plasticity.					VSt - H		
			SW	Fine to coarse SAND with trace rootlets; brown. Well graded.					Loosely Packed		
1.0			GW	Sandy fine to coarse GRAVEL with trace cobbles and rootlets; greyish brown. Well graded, rounded to sub-angular. Sand fine to coarse, well graded.				D	Loosely Packed		
1.5				Trace rootlets no longer present at 1.6 m depth.							
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Test pit reached target depth at 2 m.
Scala Penetrometer met practical refusal at 0.3 m depth.
Standing groundwater was not encountered

LOG OF TEST PIT TP15

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 04/12/2020
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No : N/A
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.611312
Longitude : 172.413467

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier – Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0	TOPSOIL		ML	Sandy SILT with trace rootlets; brown. Low plasticity. Sand fine to medium [TOPSOIL].					N/A		
0.3			ML	SILT with some fine to medium sand and trace rootlets; light brown. Low plasticity.				D	H		
0.5	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles, trace silt and rootlets; greyish brown. Well graded, rounded to sub-angular. Sand fine to coarse, well graded. Trace rootlets no longer present at 1.0 m depth.				M	Tightly Packed		
1.0											
1.5								W			
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12

Test pit reached target depth at 2 m.
Scala Penetrometer met practical refusal at 0.5 m depth.
Standing groundwater was not encountered

GEOTECH TEST PIT LOG ROLLESTON_TP_10_TO_18.GPJ NZ MASTER DATA TEMPLATE.GDT 7/12/20

LOG OF TEST PIT TP16

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 04/12/2020
Max Test Pit Depth : 2.2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No : N/A
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.613861
Longitude : 172.415625

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier – Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TOPSOIL		ML	Sandy SILT with trace rootlets; dark brown. Low plasticity. Sand fine to medium [TOPSOIL].					N/A		
0.3	ALLUVIUM		ML	SILT with some fine to medium sand and trace rootlets; light brown. Low plasticity.					VSt - H		
0.5			GW	Sandy fine to coarse GRAVEL with minor cobbles and trace rootlets; greyish brown. Well graded, rounded to sub-angular. Sand fine to coarse, well graded.				M	D		
1.3				Trace rootlets no longer present at 1.3 m depth.					Tightly Packed		
2.2				Depth of Excavation: 2.2 m Termination Condition: Target depth				W			

Test pit reached target depth at 2.2 m.
Scala Penetrometer met practical refusal at 0.6 m depth.
Standing groundwater was not encountered

GEOTECH TEST PIT LOG ROLLESTON_TP_10_TO_18.GPJ NZ MASTER DATA TEMPLATE.GDT 7/12/20

LOG OF TEST PIT TP17

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 04/12/2020
Max Test Pit Depth : 2.1 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No : N/A
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.612026
Longitude : 172.417754

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier – Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TOPSOIL		ML	Sandy SILT with trace rootlets; light brown with dark brown mottles. Low plasticity. Sand fine to medium [TOPSOIL/FILL].					N/A		
0.5			ML	SILT with some fine to medium sand and trace rootlets; light brown. Low plasticity.					VSt - H		
			SP	Fine to medium SAND with some silt and trace rootlets; light brown with orange mottles. Poorly graded.					MD		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles; greyish brown. Well graded, rounded to sub-angular. Sand fine to coarse, well graded.				M	D		
1.5									Tightly Packed		
2.0								W			
				Depth of Excavation: 2.1 m Termination Condition: Target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 (>> at 2.1 m)

Test pit reached target depth at 2.1 m.
Scala Penetrometer met practical refusal at 1 m depth.
Standing groundwater was not encountered

LOG OF TEST PIT TP18

Geotechnical Investigation
548-572 Selwyn Road
Southwest Rolleston
18113.000.001

Client : Urban Estates
Date : 04/12/2020
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator / 5 tonne
Bucket Type/Size : Toothed / 400 mm

Shear Vane No : N/A
Logged By : DD/DKi
Reviewed By : JRW
Latitude : -43.610613
Longitude : 172.419367

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TOPSOIL		ML	Sandy SILT with trace rootlets; brown. Low plasticity. Sand fine to medium [TOPSOIL].					N/A		
0.5	ALLUVIUM		ML	SILT with some fine to medium sand and trace rootlets; light brown. Low plasticity.				D	VSt - H		
1.0			GW	Sandy fine to coarse GRAVEL with minor cobbles and rootlets; greyish brown. Well graded, rounded to sub-angular. Sand fine to coarse, well graded. Trace rootlets no longer present at 1.2 m depth.				M	Tightly Packed		
1.5											
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 (>>)

Test pit reached target depth at 2 m.
Scala Penetrometer met practical refusal at 0.6 m depth.
Standing groundwater was not encountered

GEOTECH TEST PIT LOG ROLLESTON_TP_10_TO_18.GPJ NZ MASTER DATA TEMPLATE.GDT 7/12/20

APPENDIX 3:

Ecan Boreholes

Bore or Well No	BX23/0262
Well Name	Selwyn Road
Owner	MR & MRS J E & A T HEYL

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	BX23/0262	**File Number**	CRC141970
Owner	MR & MRS J E & A T HEYL	**Well Status**	Active (exist, present)
Street/Road	Selwyn Road	**NZTM Grid Reference**	BX23:52560-70858
Locality	ROLLESTON	**NZTM X and Y**	1552560 - 5170858
Location Description		**Location Accuracy**	10 - 50m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic Supply, Stock Supply
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	42.00m	**Water Level Count**	1
Diameter	150mm	**Initial Water Level**	7.80m below MP
Measuring Point Description	Top of Casing	**Highest Water Level**	7.80m below MP
Measuring Point Elevation		**Lowest Water Level**	7.80m below MP
Elevation Accuracy		**First reading**	05 Nov 2013
Ground Level	0.50m below MP	**Last reading**	05 Nov 2013
Strata Layers	9	**Calc Min 80%**	
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	1
Drill Date	05 Nov 2013	**Max Tested Yield**	
Driller	McMillan Drilling Ltd	**Drawdown at Max Tested Yield**	
Drilling Method	Rotary/Percussion	**Specific Capacity**	0.28 l/s/m
Casing Material	Steel	**Last Updated**	29 Nov 2013
Pump Type		**Last Field Check**	05 Nov 2013
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	40.48	42	2.5		125	

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
05 Nov 2013	1	1.67	22.040966	5.93	1.25

Comments

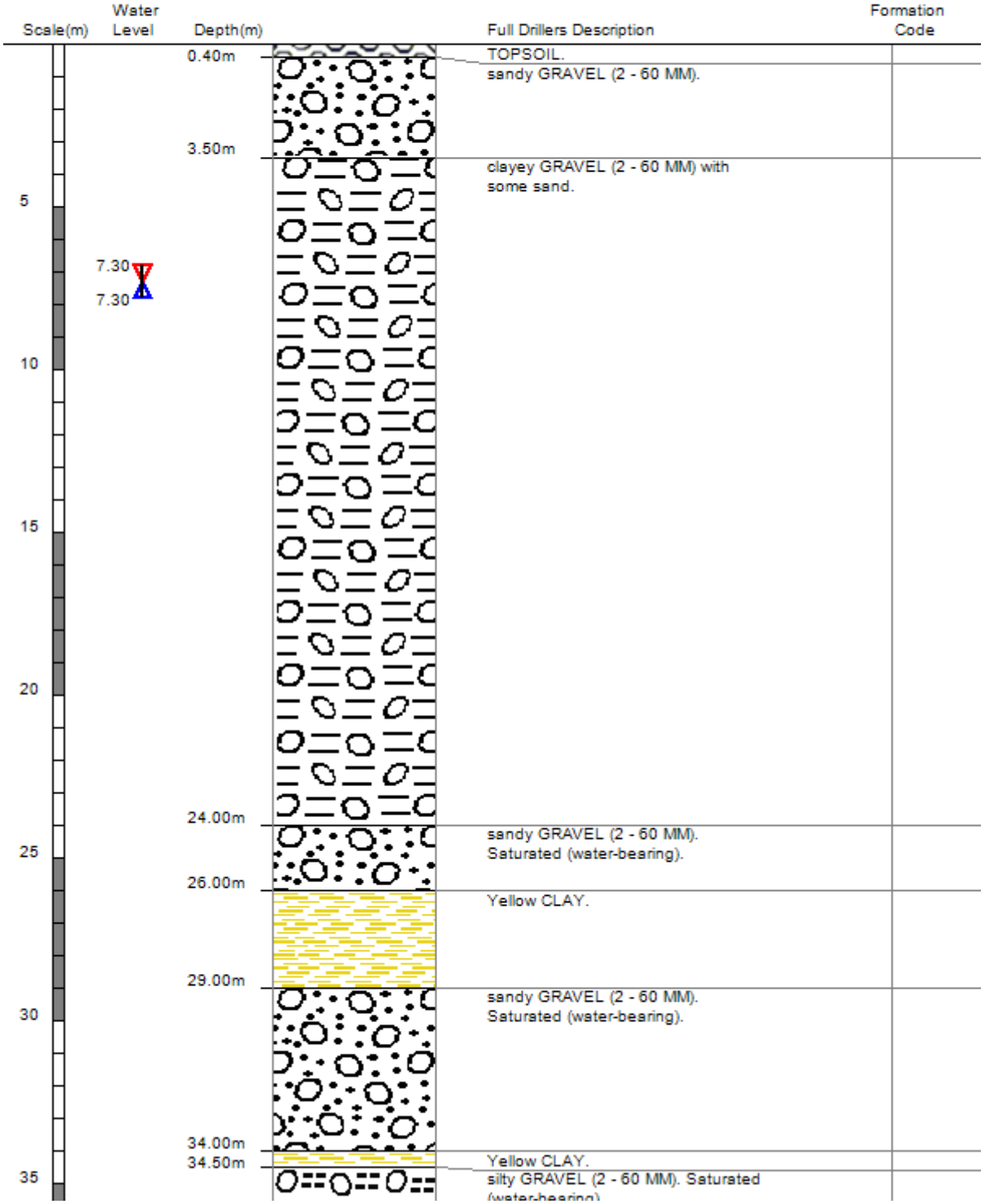
Comment Date	Comment
14 Nov 2013	NZMG Map Reference updated from: M36:62523-32589 shifted 124m
14 Nov 2013	Driller confirms

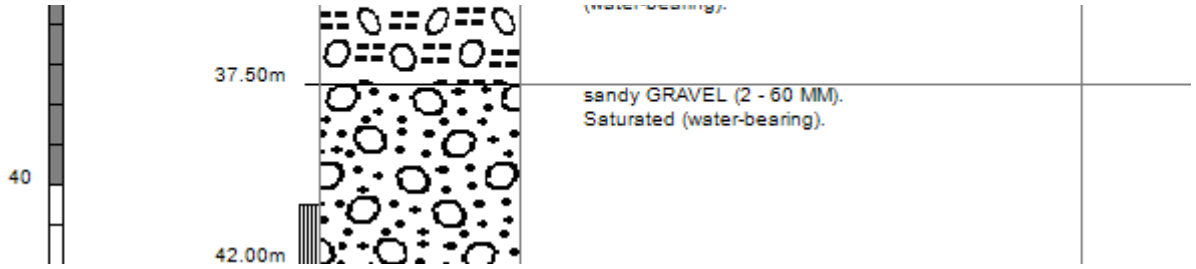
Bore Log

Borelog for well BX23/0262

Grid Reference (NZTM): 1552561 mE, 5170859 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: m +MSD Accuracy:
Driller: McMillan Drilling Ltd
Drill Method: Rotary/Percussion
Borelog Depth: 42.0 m Drill Date: 05-Nov-2013

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

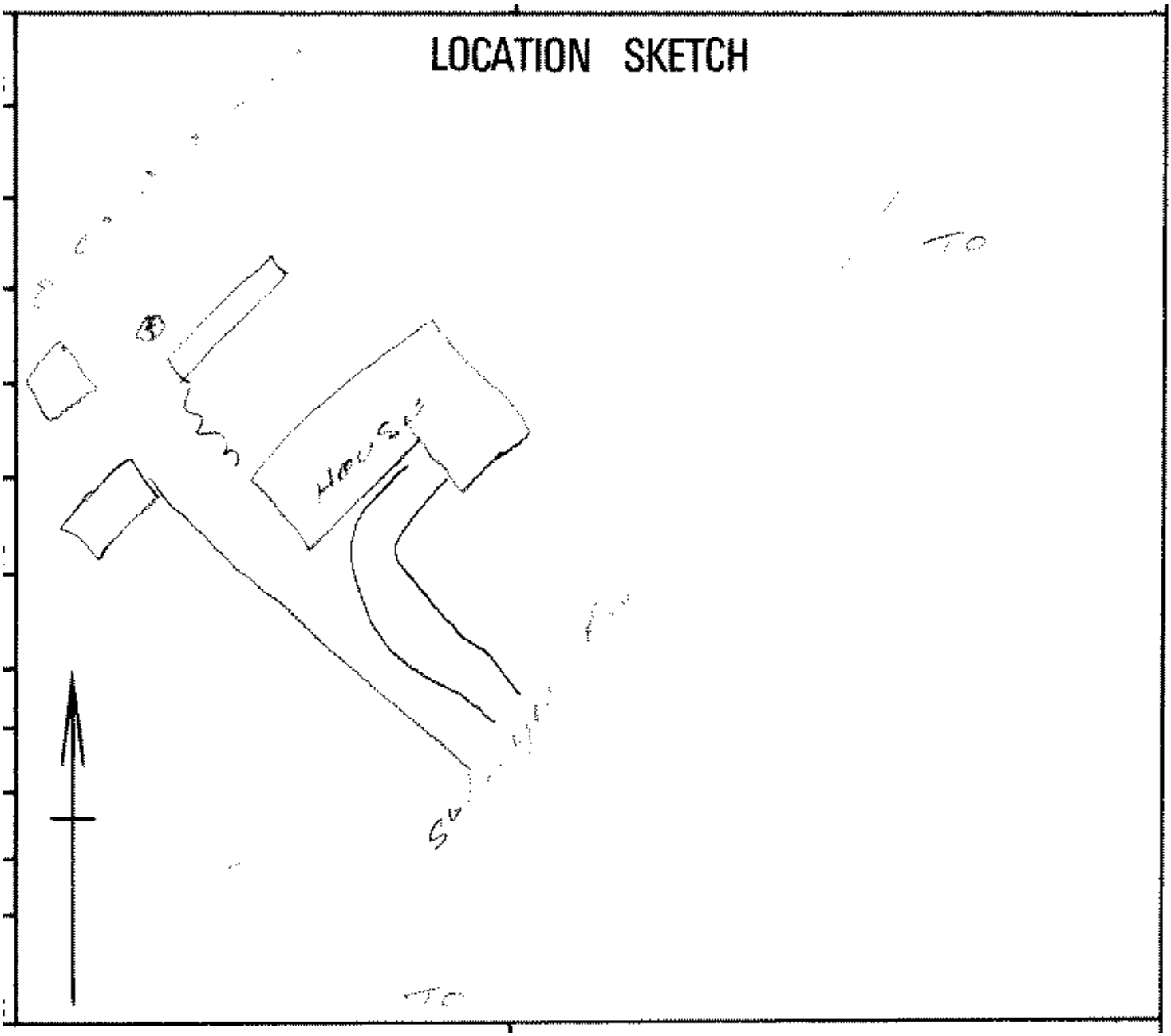



40
37.50m
42.00m
sandy GRAVEL (2 - 60 MM).
Saturated (water-bearing).

Bore or Well No	M36/1816
Well Name	SELWYN RD
Owner	MCLAUGHLAN

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M36/1816	**File Number**	
Owner	MCLAUGHLAN	**Well Status**	Not Used
Street/Road	SELWYN RD	**NZTM Grid Reference**	BX23:52806-70690
Locality	ROLLESTON	**NZTM X and Y**	1552806 - 5170690
Location Description		**Location Accuracy**	< 50m
CWMS Zone	Selwyn - Waihora	**Use**	,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	13.67m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	7.64m below MP
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	35.80m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	0	**Calc Min 80%**	9.27m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	0
Drill Date		**Max Tested Yield**	
Driller	McMillan Drilling Ltd	**Drawdown at Max Tested Yield**	
Drilling Method	Cable Tool	**Specific Capacity**	
Casing Material	STEEL	**Last Updated**	29 Jan 2007
Pump Type	Unknown	**Last Field Check**	
Water Use Data	No		



No screen data for this well

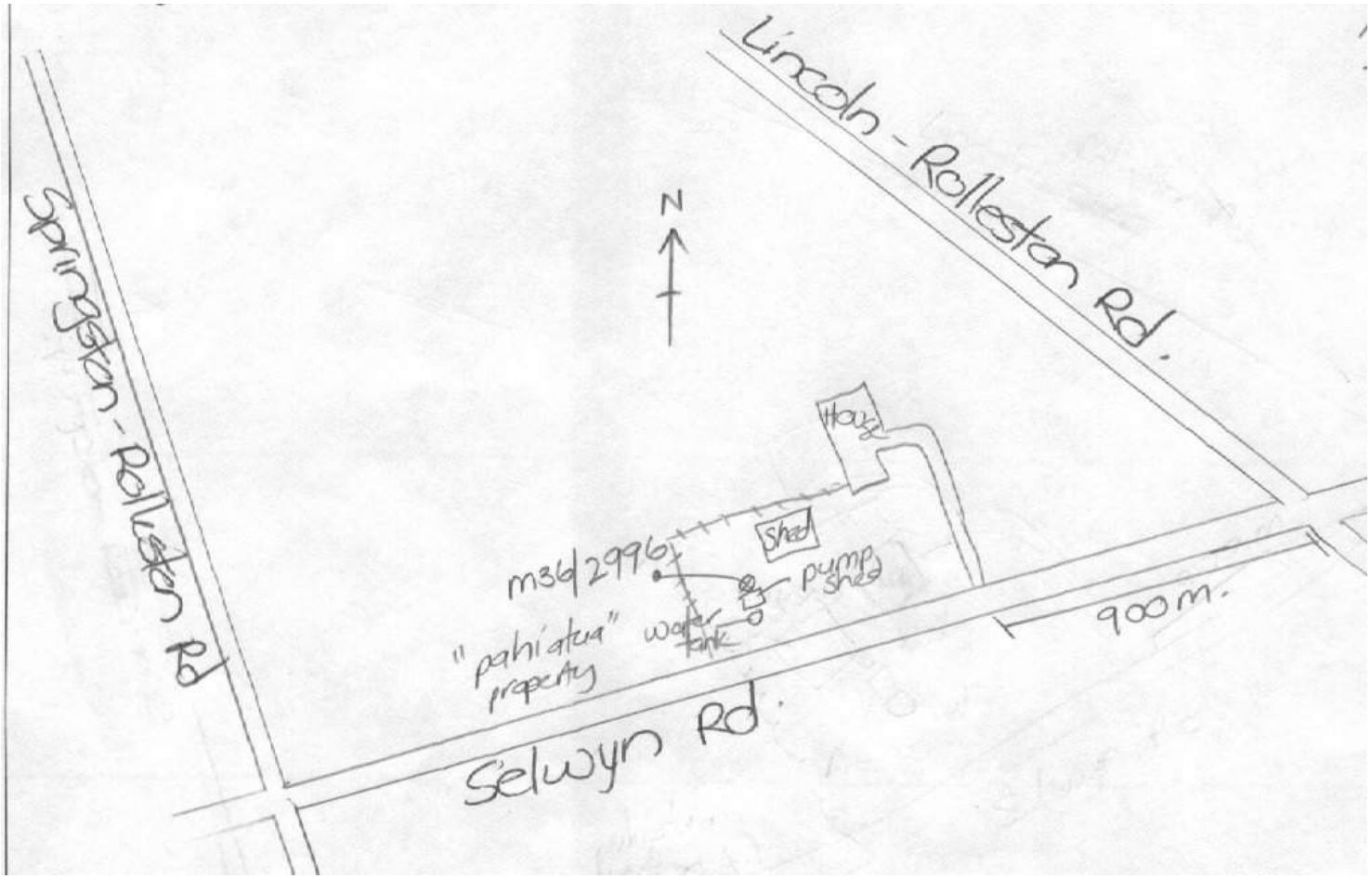
No step tests for this well

No comments for this well

Bore or Well No	M36/2996
Well Name	SELWYN ROAD
Owner	NISBET, NA & EM

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M36/2996	**File Number**	CO6C/01455
Owner	NISBET, NA & EM	**Well Status**	Active (exist, present)
Street/Road	SELWYN ROAD	**NZTM Grid Reference**	BX23:52913-70536
Locality	ROLLESTON	**NZTM X and Y**	1552913 - 5170536
Location Description	NEAR HAYSHED	**Location Accuracy**	2 - 15m
CWMS Zone	Selwyn - Waihora	**Use**	Irrigation, Domestic Supply
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	59.40m	**Water Level Count**	0
Diameter	200mm	**Initial Water Level**	9.60m below MP
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	35.67m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	0	**Calc Min 80%**	11.50m below MP (Estimated)
Aquifer Name	Linwood Gravel	**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	1
Drill Date	15 Oct 1984	**Max Tested Yield**	11 l/s
Driller	McMillan Drilling Ltd	**Drawdown at Max Tested Yield**	14 m
Drilling Method	Rotary Rig	**Specific Capacity**	0.84 l/s/m
Casing Material	STEEL	**Last Updated**	08 Nov 2013
Pump Type	Unknown	**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	55.7	59.4				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
15 Oct 1984	1	11.4	150.45929	13.6	18

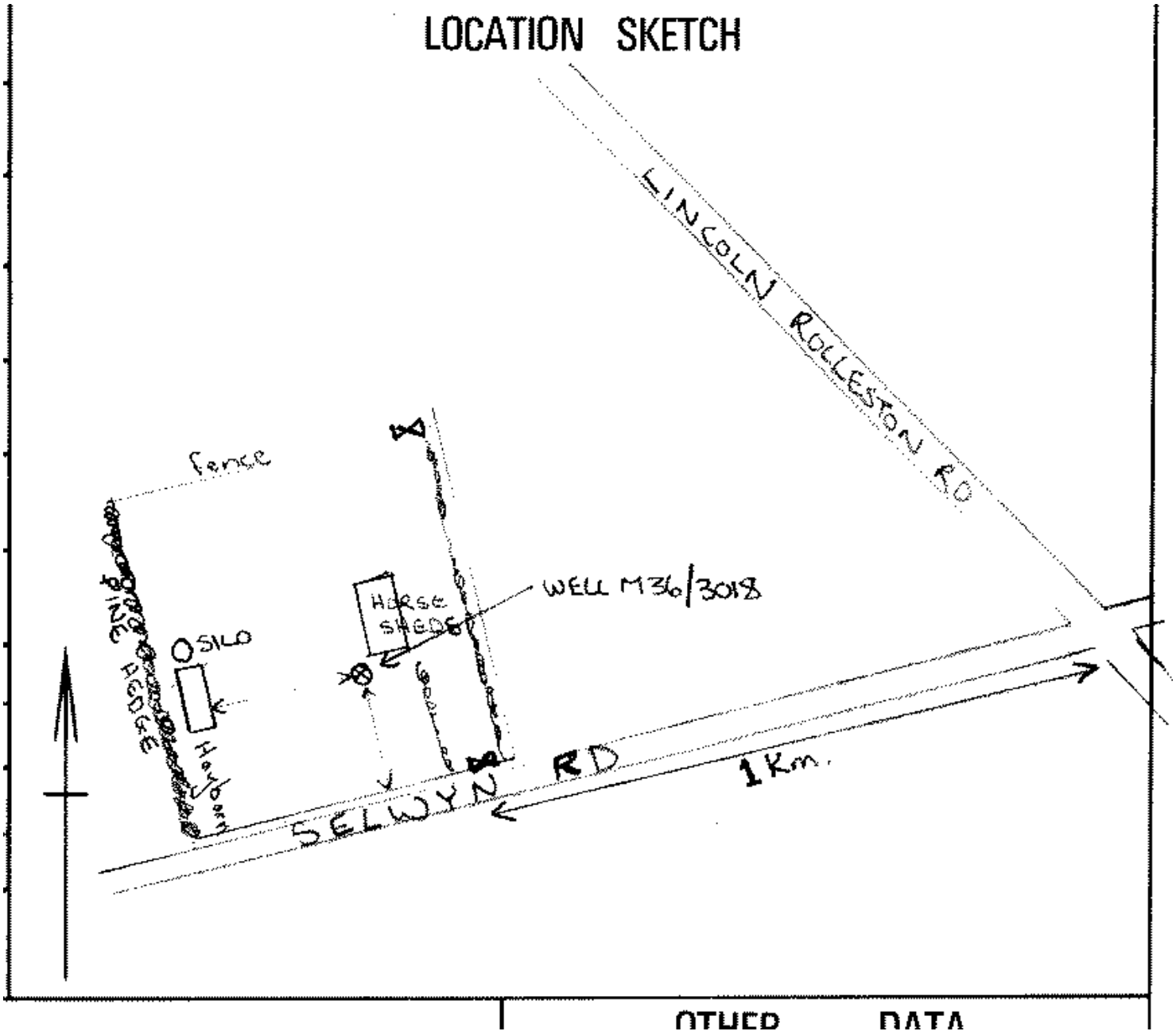
Comments

Comment Date	Comment
	NO LOG EXISTS. SCREENED IN MEDIUM STAINED GRAVELS.

Bore or Well No	M36/3018
Well Name	SELWYN RD
Owner	BOWDEN M.L.

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M36/3018	**File Number**	
Owner	BOWDEN M.L.	**Well Status**	Active (exist, present)
Street/Road	SELWYN RD	**NZTM Grid Reference**	BX23:52606-70440
Locality	ROLLESTON	**NZTM X and Y**	1552606 - 5170440
Location Description	NEAR STABLES	**Location Accuracy**	50 - 300m
CWMS Zone	Selwyn - Waihora	**Use**	Irrigation, Domestic and Stockwater
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	65.70m	**Water Level Count**	0
Diameter	200mm	**Initial Water Level**	9.32m below MP
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	34.95m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	9	**Calc Min 80%**	11.68m below MP (Estimated)
Aquifer Name	Linwood Gravel	**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	1
Drill Date	13 Jan 1986	**Max Tested Yield**	16 l/s
Driller	McMillan Drilling Ltd	**Drawdown at Max Tested Yield**	22 m
Drilling Method	Rotary/Percussion	**Specific Capacity**	0.75 l/s/m
Casing Material	STEEL	**Last Updated**	08 Nov 2013
Pump Type	Submersible	**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	58.4	61.3				
2	Stainless steel	63.3	65.4				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
13 Jan 1986	1	16.3	215.130386	21.7	14

Comments

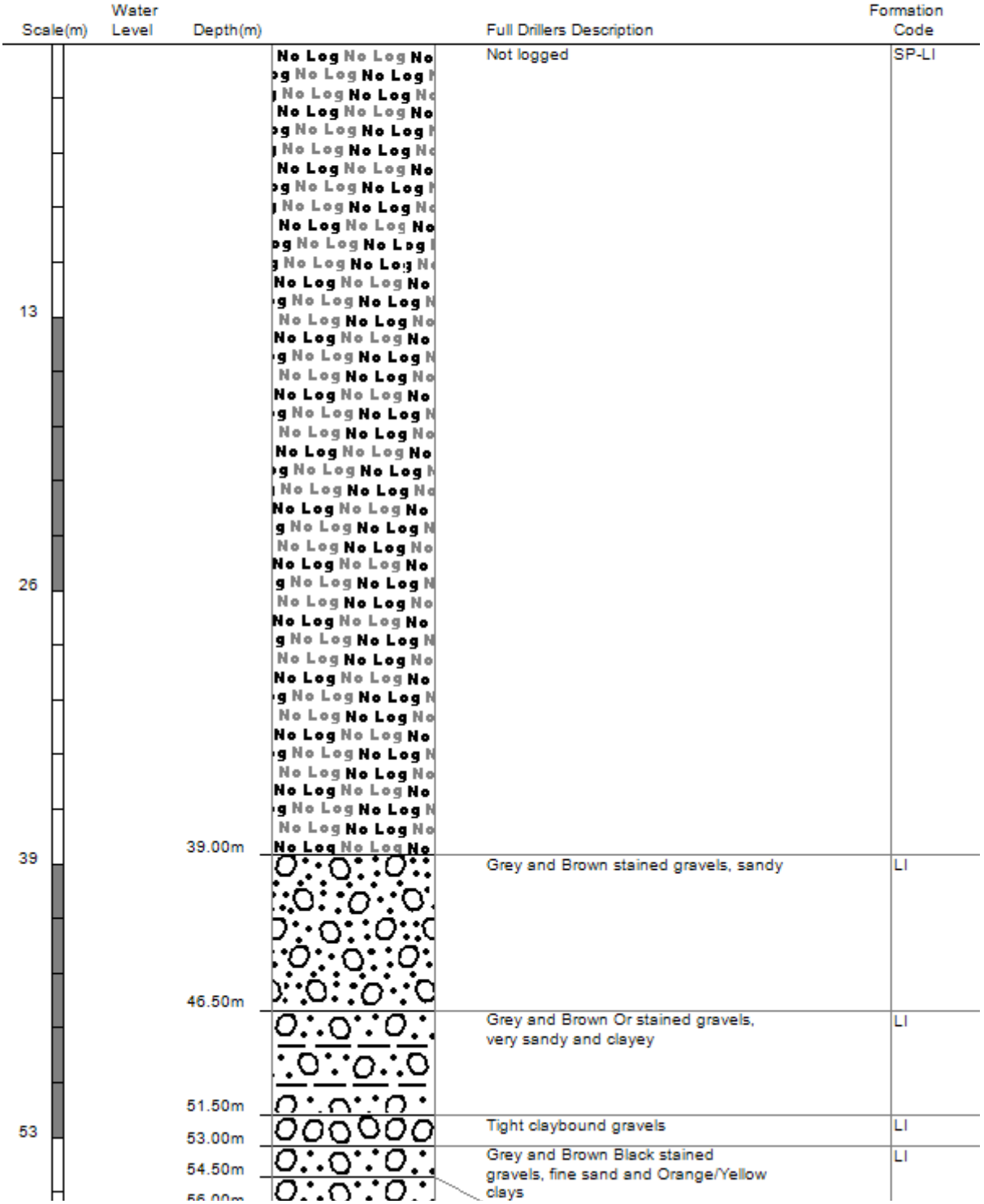
Comment Date	Comment
	DRILLED TO 42M IN 1985.11.4l/s 23M DD

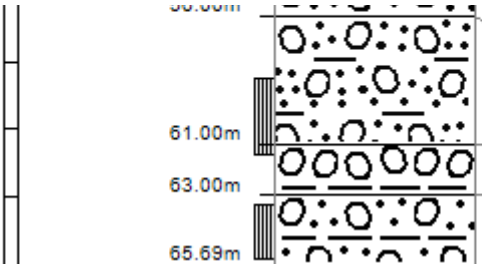
Bore Log

Borelog for well M36/3018

Grid Reference (NZTM): 1552607 mE, 5170441 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 35.0 m +MSD Accuracy: < 2.5 m
Driller: McMillan Drilling Ltd
Drill Method: Rotary/Percussion
Borelog Depth: 65.7 m Drill Date: 13-Jan-1986

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



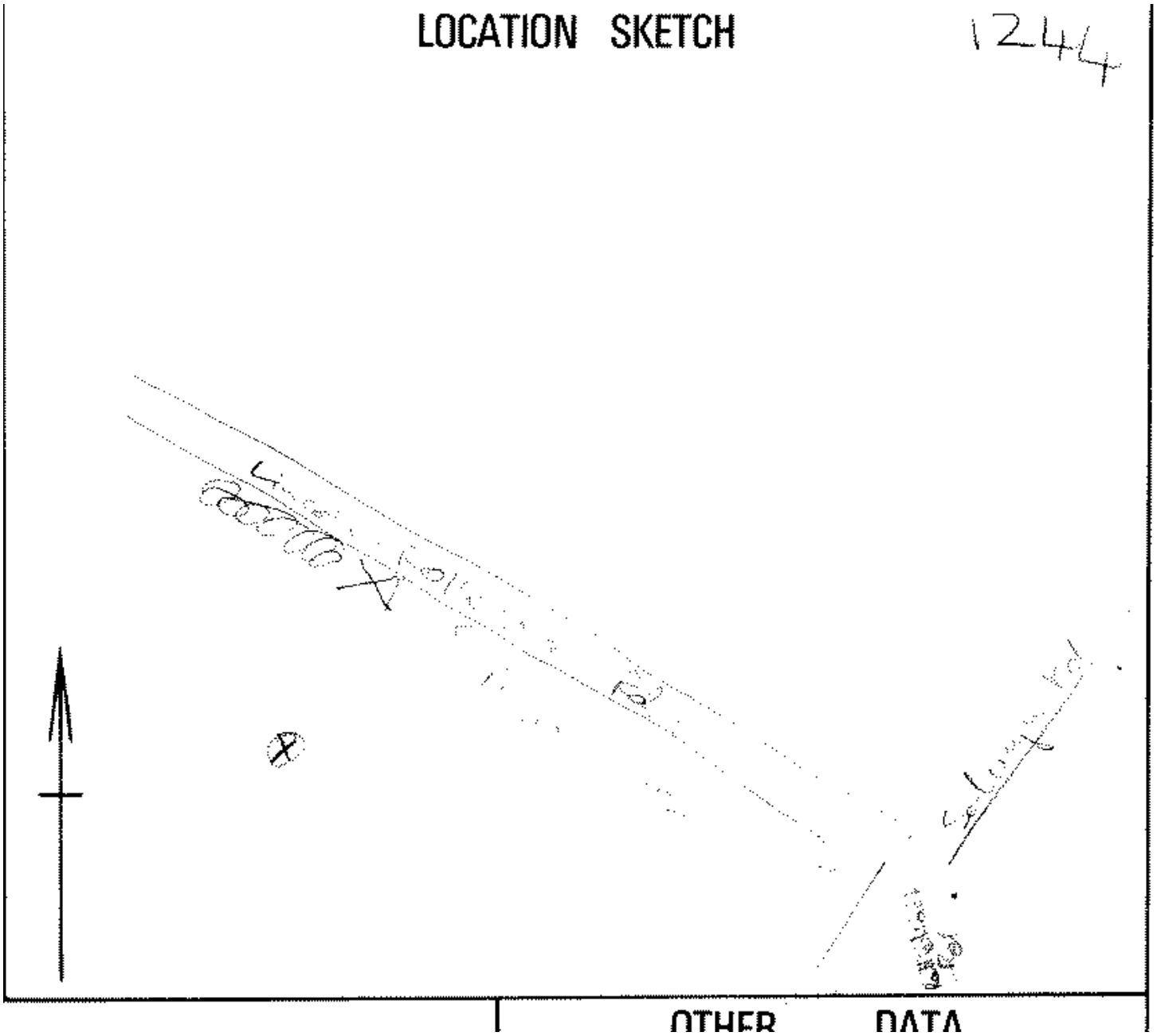


	Very hard claybound gravels, very fine sand	LI
	Free Brown and Grey stained gravels, some clay and very sandy	LI
	Hard claybound gravels	LI
	Grey and Brown stained gravels, sandy and clayey	LI

Bore or Well No	M36/3836
Well Name	LINCOLN ROLLESTON RD
Owner	Mr & Mrs K M & J A Saulsbury

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M36/3836	**File Number**	CO6C/02068
Owner	Mr & Mrs K M & J A Saulsbury	**Well Status**	Active (exist, present)
Street/Road	LINCOLN ROLLESTON RD	**NZTM Grid Reference**	BX23:53106-71190
Locality	BROADFIELD	**NZTM X and Y**	1553106 - 5171190
Location Description		**Location Accuracy**	50 - 300m
CWMS Zone	Selwyn - Waihora	**Use**	Irrigation,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	56.60m	**Water Level Count**	0
Diameter	220mm	**Initial Water Level**	10.70m below MP
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	37.24m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	8	**Calc Min 80%**	11.88m below MP (Estimated)
Aquifer Name	Linwood Gravel	**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	1
Drill Date	01 Nov 1987	**Max Tested Yield**	11 l/s
Driller	McMillan Drilling Ltd	**Drawdown at Max Tested Yield**	14 m
Drilling Method	Cable Tool	**Specific Capacity**	0.83 l/s/m
Casing Material	STEEL	**Last Updated**	08 Nov 2013
Pump Type	Submersible	**Last Field Check**	
Water Use Data	Yes		



Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	53.6	56.6				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
01 Nov 1987	1	11.4	150.45929	13.7	4

Comments

Comment Date	Comment
21 Jul 2011	Previous owner VAN DE KLUNDERT A.W.

Bore Log

Borelog for well M36/3836

Grid Reference (NZTM): 1553107 mE, 5171191 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 37.2 m +MSD Accuracy: < 2.5 m
Driller: McMillan Drilling Ltd
Drill Method: Cable Tool
Borelog Depth: 56.6 m Drill Date: 01-Nov-1987

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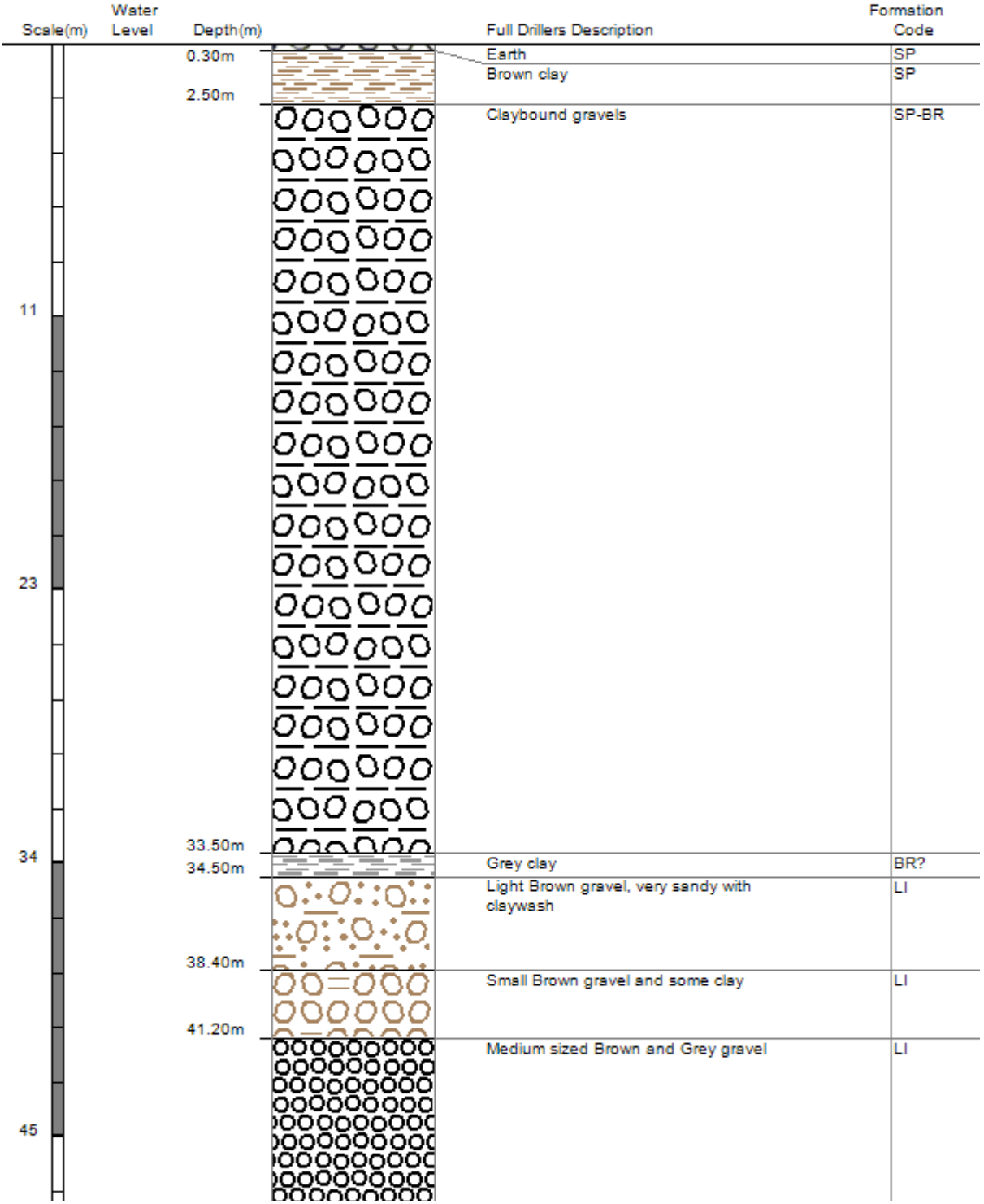

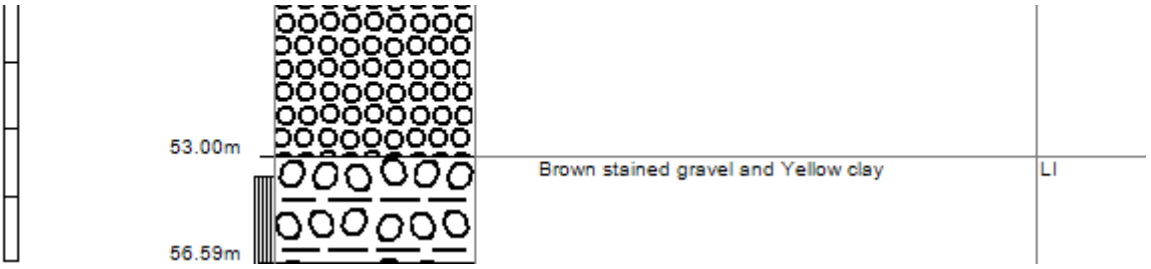
53.00m
56.59m
Brown stained gravel and Yellow clay
LI

Bore or Well No	M36/4433
Well Name	SELWYN ROAD
Owner	Mr & Mrs H J & D P Bates

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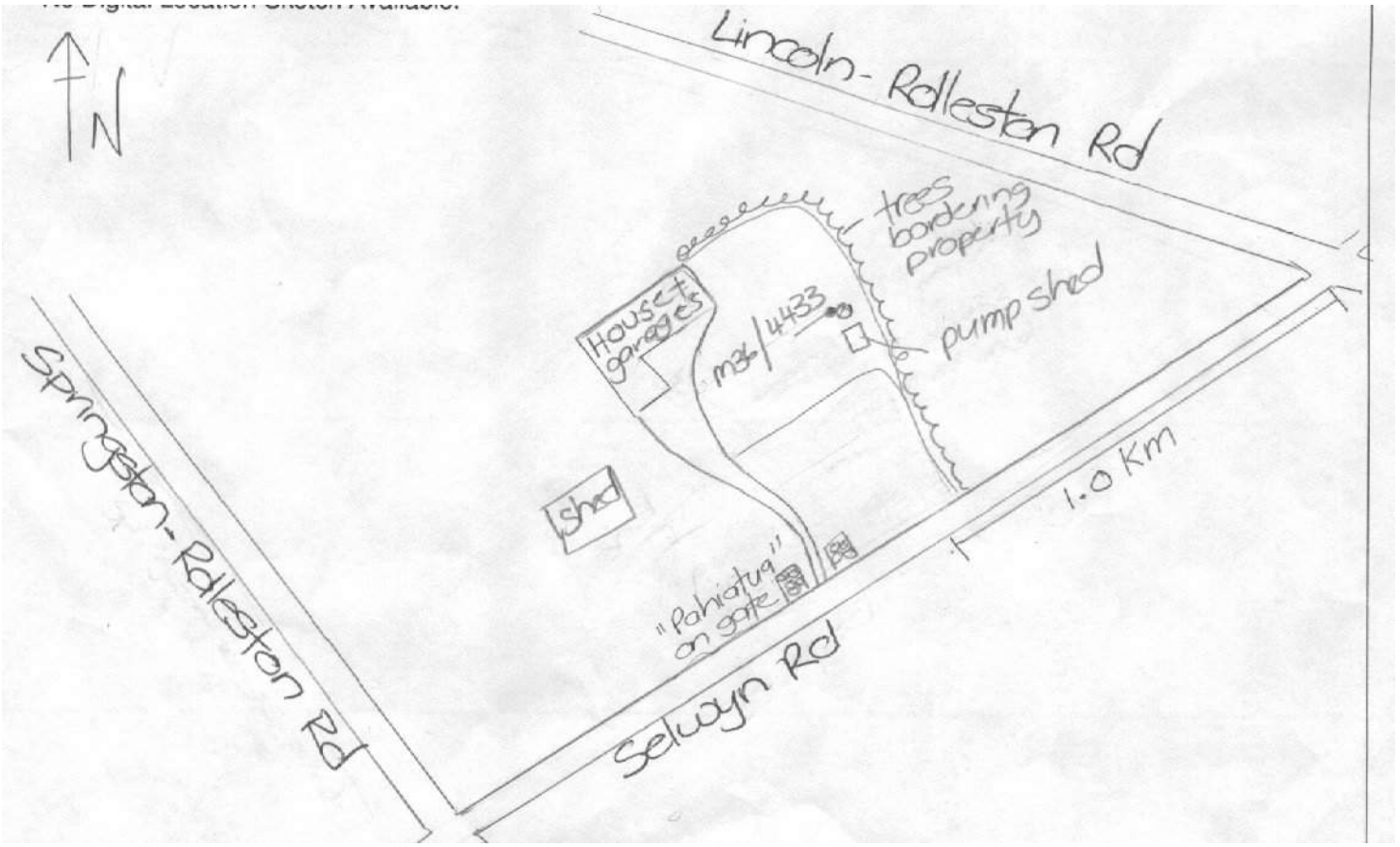
Well Number	M36/4433	**File Number**	CO6C/02646
Owner	Mr & Mrs H J & D P Bates	**Well Status**	Active (exist, present)
Street/Road	SELWYN ROAD	**NZTM Grid Reference**	BX23:52875-70540
Locality	ROLLESTON	**NZTM X and Y**	1552875 - 5170540
Location Description		**Location Accuracy**	2 - 15m
CWMS Zone	Selwyn - Waihora	**Use**	Irrigation, Domestic Supply
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	30.00m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	9.70m below MP
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	35.61m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	10	**Calc Min 80%**	12.08m below MP (Estimated)
Aquifer Name	Bromley Formation	**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	1
Drill Date	20 Dec 1991	**Max Tested Yield**	2 l/s
Driller	Smiths Welldrilling	**Drawdown at Max Tested Yield**	4 m
Drilling Method	Cable Tool	**Specific Capacity**	0.52 l/s/m
Casing Material		**Last Updated**	08 Nov 2013
Pump Type	Unknown	**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	28	30				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
20 Dec 1991	1	2.2	29.036005	4.2	2

Comments

Comment Date	Comment
	Previous owner S Matheson.

Bore Log

Borelog for well M36/4433

Grid Reference (NZTM): 1552876 mE, 5170541 mN
Location Accuracy: 2 - 15m
Ground Level Altitude: 35.6 m +MSD Accuracy: < 2.5 m
Driller: Smiths Welldrilling
Drill Method: Cable Tool
Borelog Depth: 30.0 m Drill Date: 20-Dec-1991

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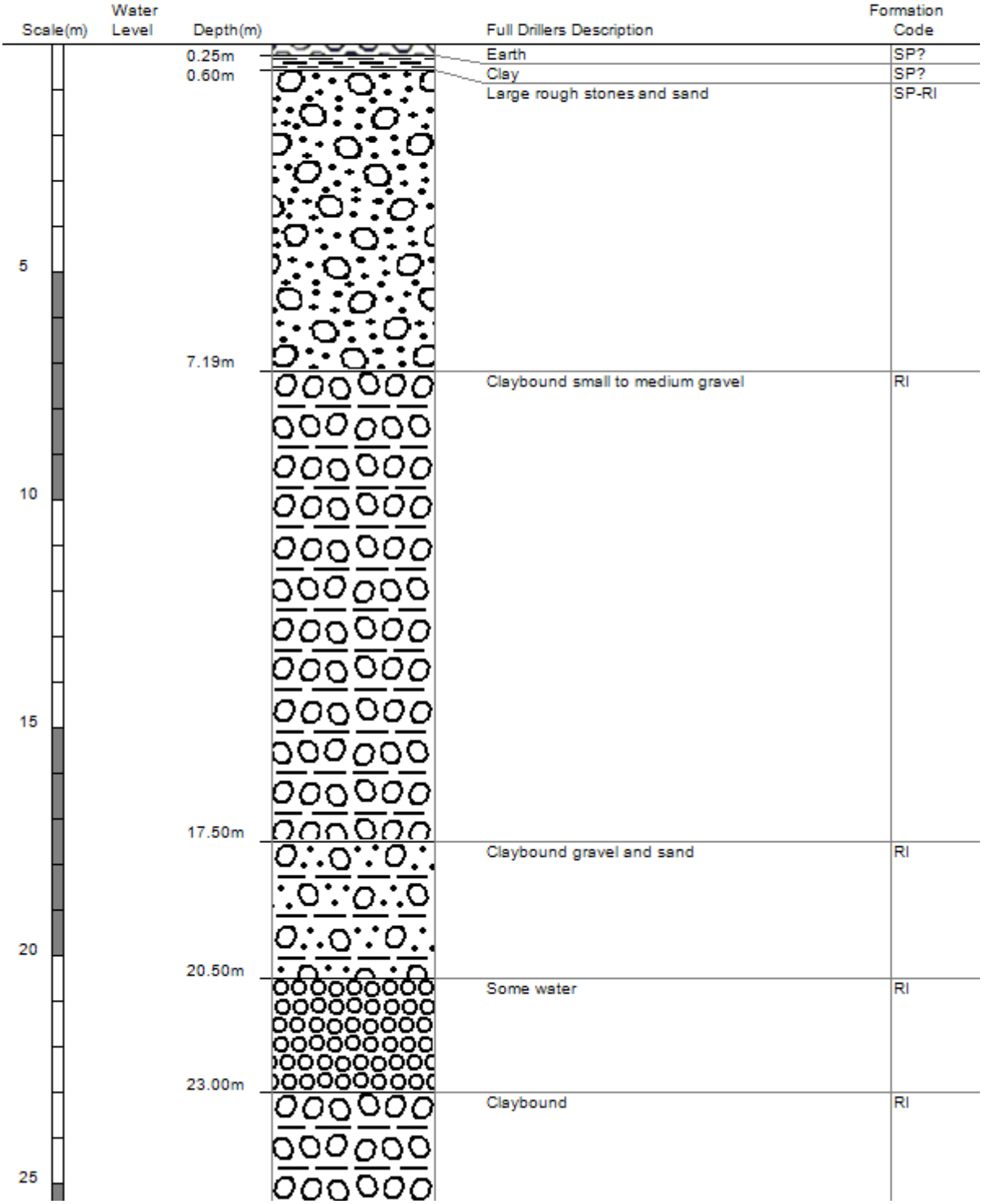


26.00m
27.00m
29.00m
30.00m
Patch Yellow clay
BR?
Free sandy gravel
BR?
Small Black/purple free gravel, sandy
BR?

Bore or Well No	M36/7975
Well Name	SELWYN ROAD
Owner	MR & MS SH & EL LOEFFLER & HUISMANS

Well Number	M36/7975	**File Number**	CO6C/23830
Owner	MR & MS SH & EL LOEFFLER & HUISMANS	**Well Status**	Active (exist, present)
Street/Road	SELWYN ROAD	**NZTM Grid Reference**	BX23:52316-71000
Locality	ROLLESTON	**NZTM X and Y**	1552316 - 5171000
Location Description		**Location Accuracy**	50 - 300m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	37.50m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	10.00m below MP
Measuring Point Description	ToC	**Highest Water Level**	
Measuring Point Elevation	38.00m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.30m below MP	**Last reading**	
Strata Layers	12	**Calc Min 80%**	12.03m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	3
Drill Date	05 Sep 2005	**Max Tested Yield**	6 l/s
Driller	Dynes Road Drilling	**Drawdown at Max Tested Yield**	17 m
Drilling Method	Cable Tool	**Specific Capacity**	0.43 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	35	37.5				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
05 Sep 2005	1	3.636864	48	8.5	1
05 Sep 2005	2	5.379528	71	12.2	1

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
05 Sep 2005	3	6.364512	84	17.3	2

No comments for this well

Bore Log

Borelog for well M36/7975

Grid Reference (NZTM): 1552317 mE, 5171001 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 37.7 m +MSD Accuracy: < 2.5 m
Driller: Dynes Road Drilling
Drill Method: Cable Tool
Borelog Depth: 37.5 m Drill Date: 05-Sep-2005

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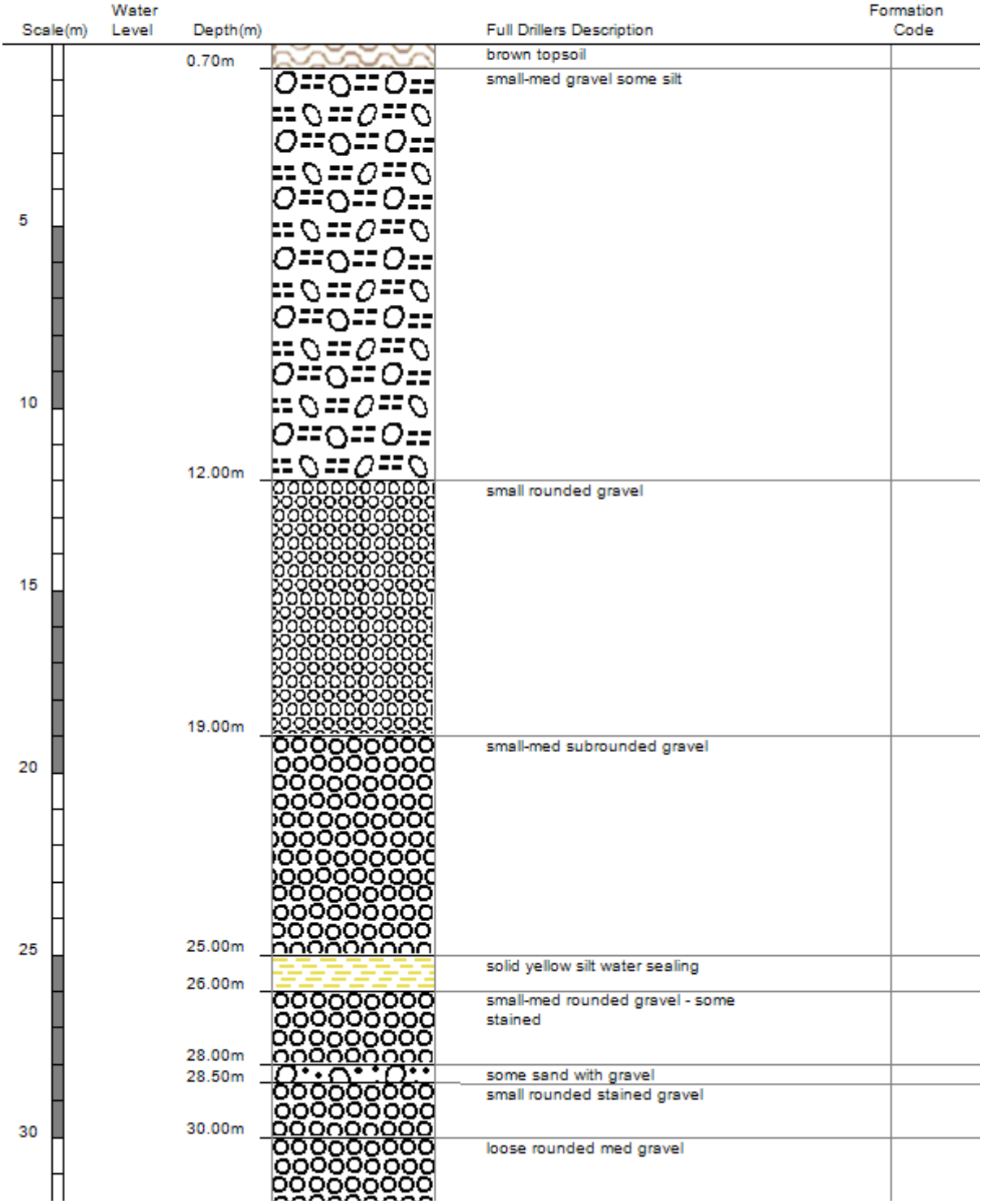

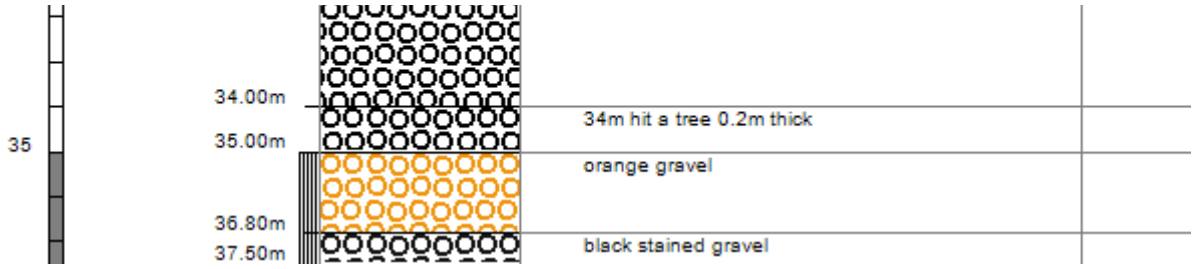
35
34.00m
35.00m
36.80m
37.50m
34m hit a tree 0.2m thick
orange gravel
black stained gravel

Bore or Well No	M36/7976
Well Name	SELWYN ROAD
Owner	WEATHERBY ESTATE LIMITED

Well Number	M36/7976	**File Number**	CO6C/23897
Owner	WEATHERBY ESTATE LIMITED	**Well Status**	Active (exist, present)
Street/Road	SELWYN ROAD	**NZTM Grid Reference**	BX23:52386-70950
Locality	BROADFIELD	**NZTM X and Y**	1552386 - 5170950
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**	10.60m below MP
Measuring Point Description	ToC	**Highest Water Level**	
Measuring Point Elevation	37.00m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.40m below MP	**Last reading**	
Strata Layers	11	**Calc Min 80%**	12.04m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	1
Drill Date	24 Aug 2005	**Max Tested Yield**	2 l/s
Driller	Daly Water Wells Ltd	**Drawdown at Max Tested Yield**	3 m
Drilling Method	Rotary Rig	**Specific Capacity**	0.63 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	36				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
24 Aug 2005	1	2	26.396368	3.2	4

Comments

Comment Date	Comment
28 Mar 2006	Gridref changed from: M36:6233-3268

Bore Log

Borelog for well M36/7976

Grid Reference (NZTM): 1552387 mE, 5170951 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 36.6 m +MSD Accuracy: < 2.5 m
Driller: Daly Water Wells Ltd
Drill Method: Rotary Rig
Borelog Depth: 36.0 m Drill Date: 24-Aug-2005

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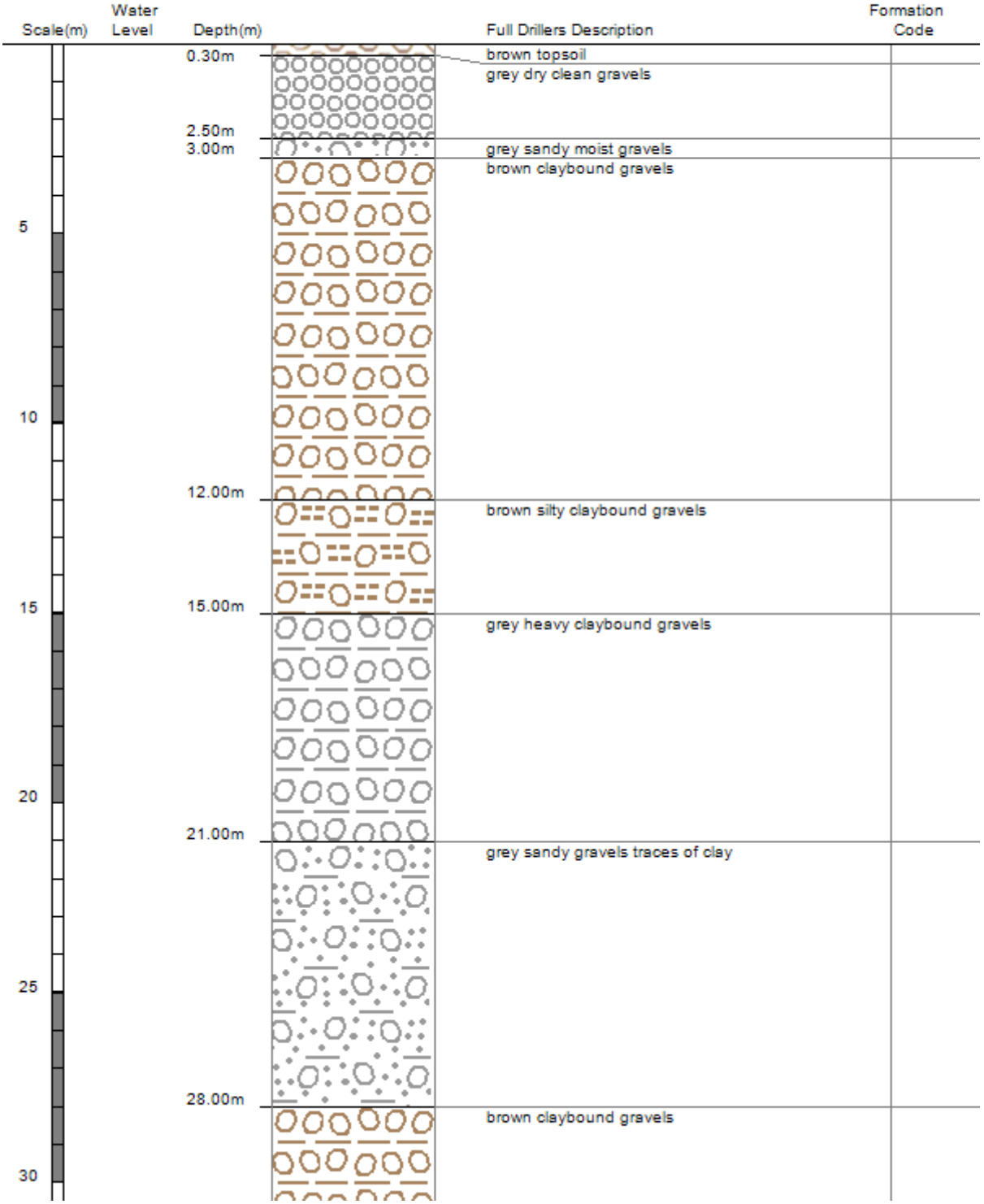

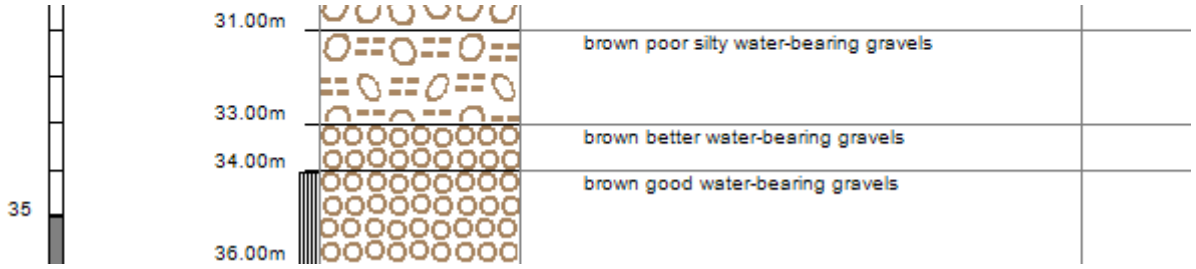
31.00m
brown poor silty water-bearing gravels
33.00m
brown better water-bearing gravels
34.00m
brown good water-bearing gravels
35
36.00m

Bore or Well No	M36/8002
Well Name	SELWYN ROAD
Owner	MR & MRS AT & JM MULCAY

Well Number	M36/8002	**File Number**	CO6C/24021
Owner	MR & MRS AT & JM MULCAY	**Well Status**	Active (exist, present)
Street/Road	SELWYN ROAD	**NZTM Grid Reference**	BX23:52536-70700
Locality	ROLLESTON	**NZTM X and Y**	1552536 - 5170700
Location Description		**Location Accuracy**	50 - 300m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	66.00m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	12.40m below MP
Measuring Point Description	ToC	**Highest Water Level**	
Measuring Point Elevation	36.00m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.30m below MP	**Last reading**	
Strata Layers	13	**Calc Min 80%**	11.96m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	1
Drill Date	28 Oct 2005	**Max Tested Yield**	4 l/s
Driller	Smiths Welldrilling	**Drawdown at Max Tested Yield**	11 m
Drilling Method	Rotary/Percussion	**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	64.5	66				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
30 Oct 2005	1	4.06	53.5846252	11	2

Comments

Comment Date	Comment
04 May 2007	Gridref changed from: M36:6249-3232, original gridref incorrect (on road) still waiting for BCR

Bore Log

Borelog for well M36/8002

Grid Reference (NZTM): 1552537 mE, 5170701 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 35.7 m +MSD Accuracy: < 2.5 m
Driller: Smiths Welldrilling
Drill Method: Rotary/Percussion
Borelog Depth: 66.0 m Drill Date: 28-Oct-2005

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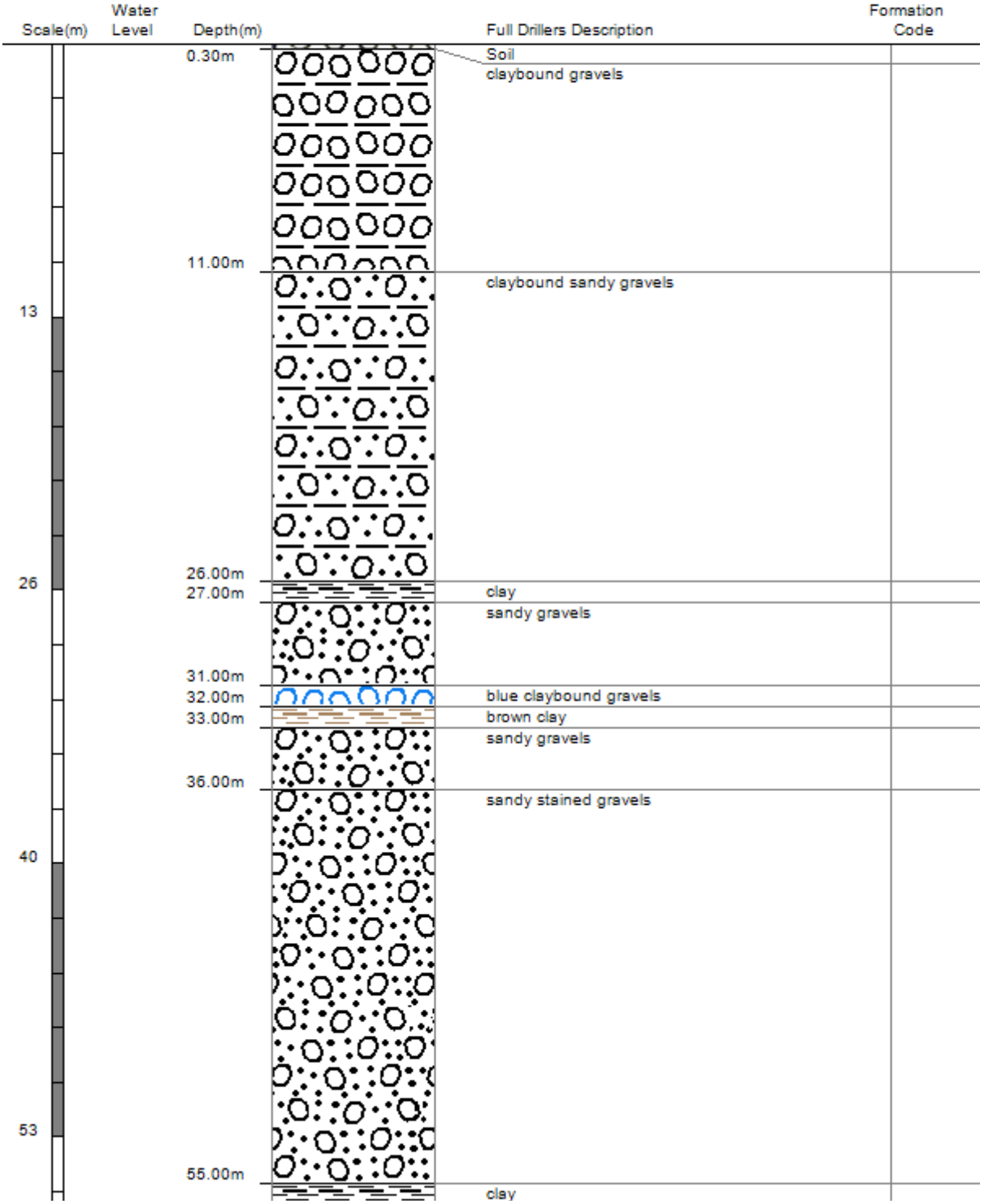

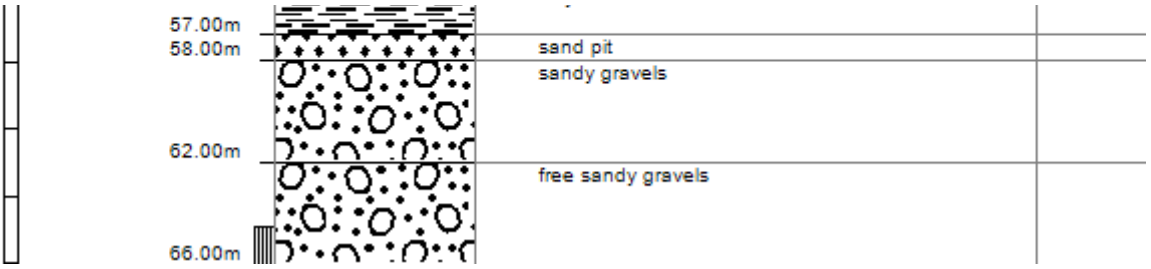
57.00m
58.00m
sand pit
sandy gravels
62.00m
free sandy gravels
66.00m

Bore or Well No	M36/8009
Well Name	SELWYN ROAD
Owner	MR & MRS GC & PM MORGAN

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Well Number	M36/8009	**File Number**	CO6C/24231
Owner	MR & MRS GC & PM MORGAN	**Well Status**	Active (exist, present)
Street/Road	SELWYN ROAD	**NZTM Grid Reference**	BX23:52356-70860
Locality	BROADFIELD	**NZTM X and Y**	1552356 - 5170860
Location Description		**Location Accuracy**	50 - 300m
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**	12.20m below MP
Measuring Point Description	ToC	**Highest Water Level**	
Measuring Point Elevation	36.18m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 5 m	**First reading**	
Ground Level	0.40m below MP	**Last reading**	
Strata Layers	10	**Calc Min 80%**	11.92m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	1
Drill Date	01 Nov 2005	**Max Tested Yield**	2 l/s
Driller	Daly Water Wells Ltd	**Drawdown at Max Tested Yield**	3 m
Drilling Method	Rotary Rig	**Specific Capacity**	0.63 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	Slotted PVC	34	36				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
01 Nov 2006	1	2	26.396368	3.2	3

No comments for this well

Bore Log

Borelog for well M36/8009 page 1 of 2

Grid Reference (NZTM): 1552357 mE, 5170861 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 35.8 m +MSD Accuracy: < 0.5 m
Driller: Daly Water Wells Ltd
Drill Method: Rotary Rig
Borelog Depth: 36.0 m Drill Date: 01-Nov-2005

Environment Canterbury Regional Council
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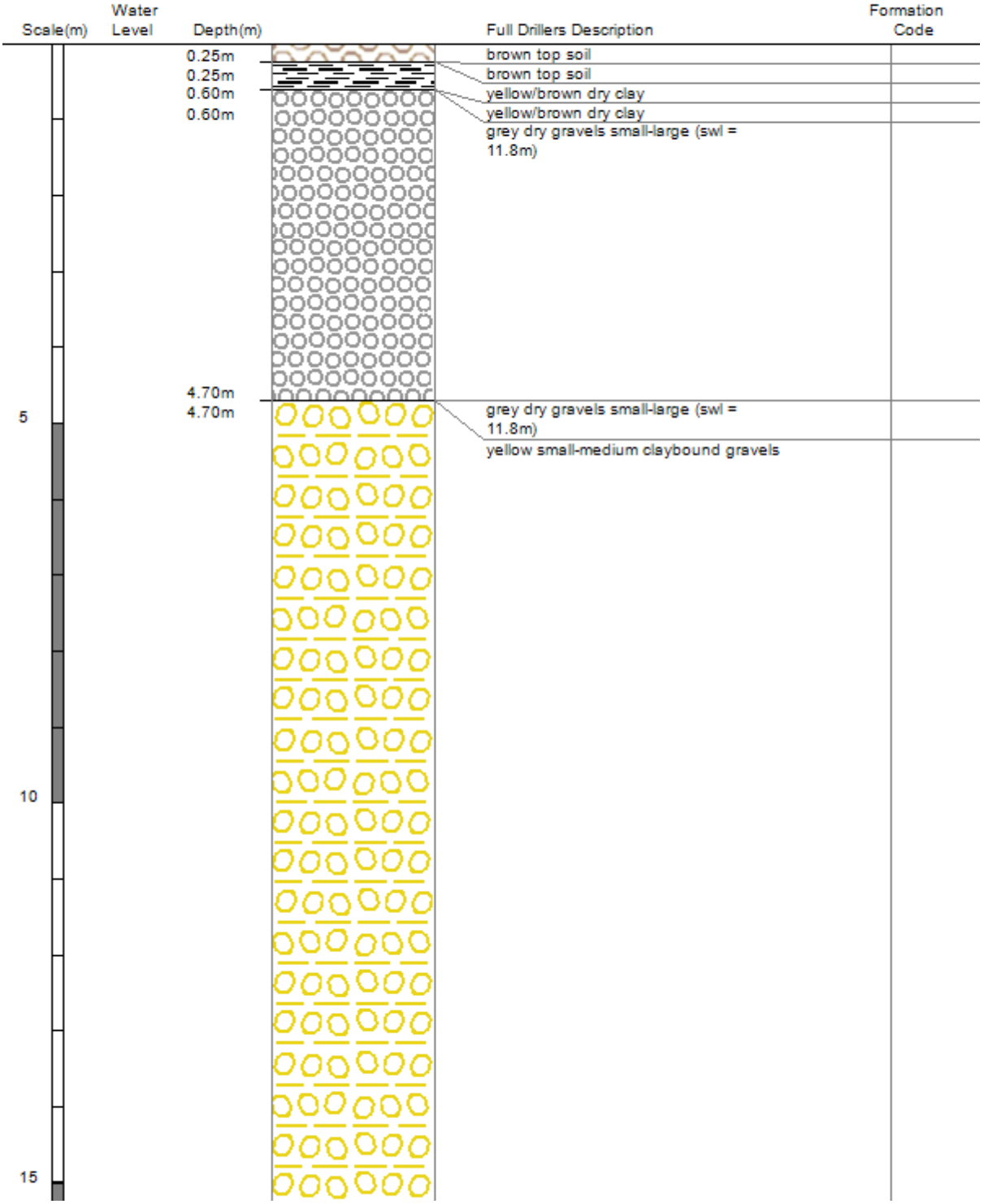

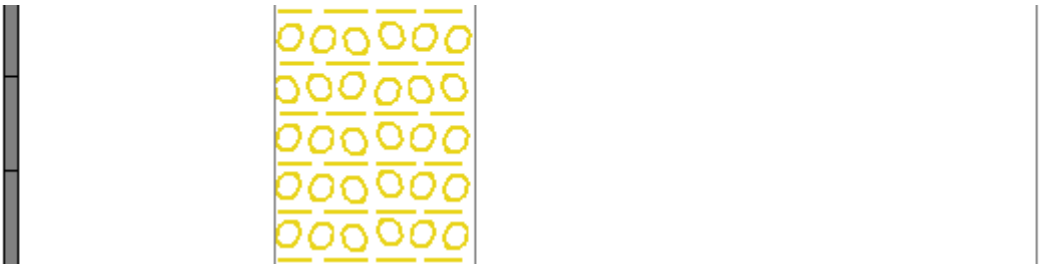

Bore or Well No	M36/8138
Well Name	LINCOLN ROLLESTON ROAD
Owner	MR & MRS RG & VA HUBBARD

Well Number	M36/8138	**File Number**	CO6C/24642
Owner	MR & MRS RG & VA HUBBARD	**Well Status**	Active (exist, present)
Street/Road	LINCOLN ROLLESTON ROAD	**NZTM Grid Reference**	BX23:52946-71200
Locality	ROLLESTON	**NZTM X and Y**	1552946 - 5171200
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**	14.60m below MP
Measuring Point Description	ToC	**Highest Water Level**	
Measuring Point Elevation	35.69m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 5 m	**First reading**	
Ground Level	0.40m below MP	**Last reading**	
Strata Layers	5	**Calc Min 80%**	12.83m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	1
Drill Date	16 Jan 2006	**Max Tested Yield**	2 l/s
Driller	Daly Water Wells Ltd	**Drawdown at Max Tested Yield**	4 m
Drilling Method	Rotary Rig	**Specific Capacity**	0.51 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	36				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
16 Jan 2006	1	2	26.396368	3.9	0

Comments

Comment Date	Comment
27 May 2008	Gridref changed from: M36:6294-3282 (BCP received)

Bore Log

Borelog for well M36/8138

Grid Reference (NZTM): 1552947 mE, 5171201 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 35.3 m +MSD Accuracy: < 0.5 m
Driller: Daly Water Wells Ltd
Drill Method: Rotary Rig
Borelog Depth: 36.0 m Drill Date: 16-Jan-2006

Environment Canterbury Regional Council
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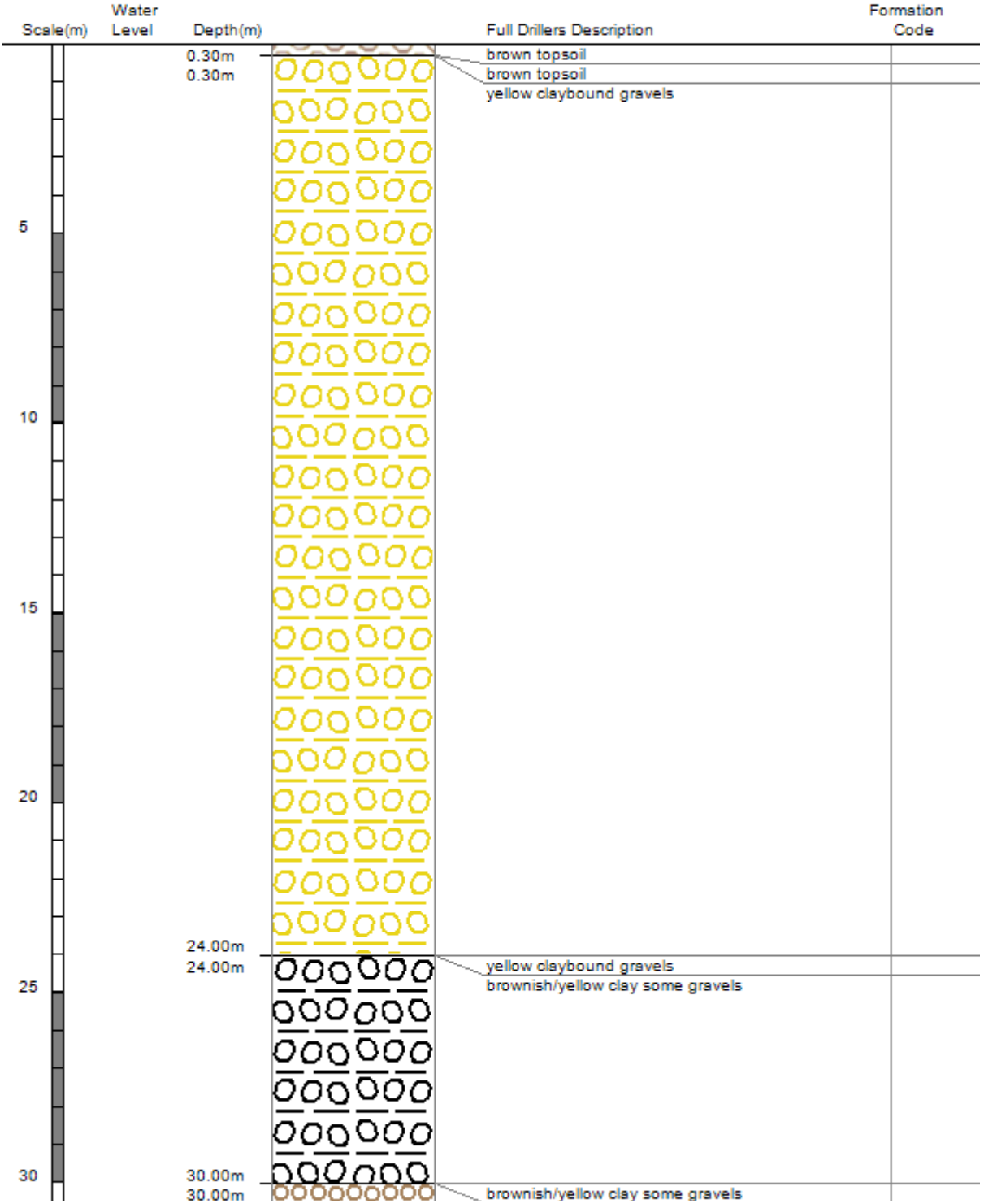
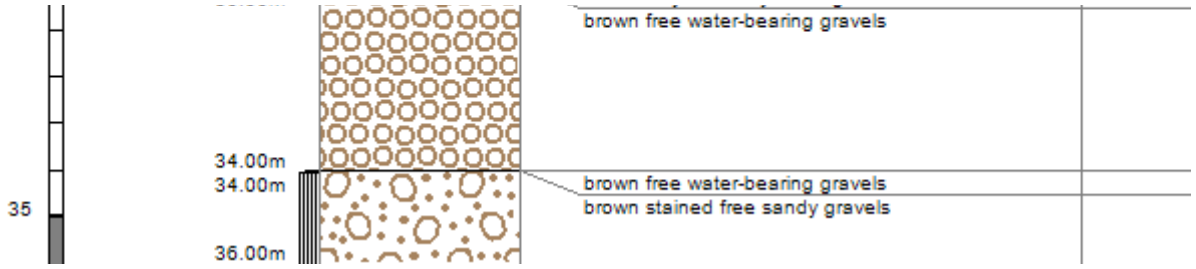



brown free water-bearing gravels
34.00m
34.00m
brown free water-bearing gravels
brown stained free sandy gravels
35
36.00m

Bore or Well No	M36/8299
Well Name	SELWYN ROAD
Owner	MR GJ & MRS BA SCURR

Well Number	M36/8299	**File Number**	CO6C/24910
Owner	MR GJ & MRS BA SCURR	**Well Status**	Active (exist, present)
Street/Road	SELWYN ROAD	**NZTM Grid Reference**	BX23:52686-70750
Locality	BROADFIELDS	**NZTM X and Y**	1552686 - 5170750
Location Description		**Location Accuracy**	10 - 50m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	90.00m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	21.00m below MP
Measuring Point Description	ToC	**Highest Water Level**	
Measuring Point Elevation	34.56m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 5 m	**First reading**	
Ground Level	0.60m below MP	**Last reading**	
Strata Layers	7	**Calc Min 80%**	11.87m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	0
Drill Date	20 Feb 2008	**Max Tested Yield**	
Driller	Giltrap Drilling	**Drawdown at Max Tested Yield**	
Drilling Method	Rotary Rig	**Specific Capacity**	
Casing Material	Steel	**Last Updated**	19 Mar 2010
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	88.5	90				

No step tests for this well

Comments

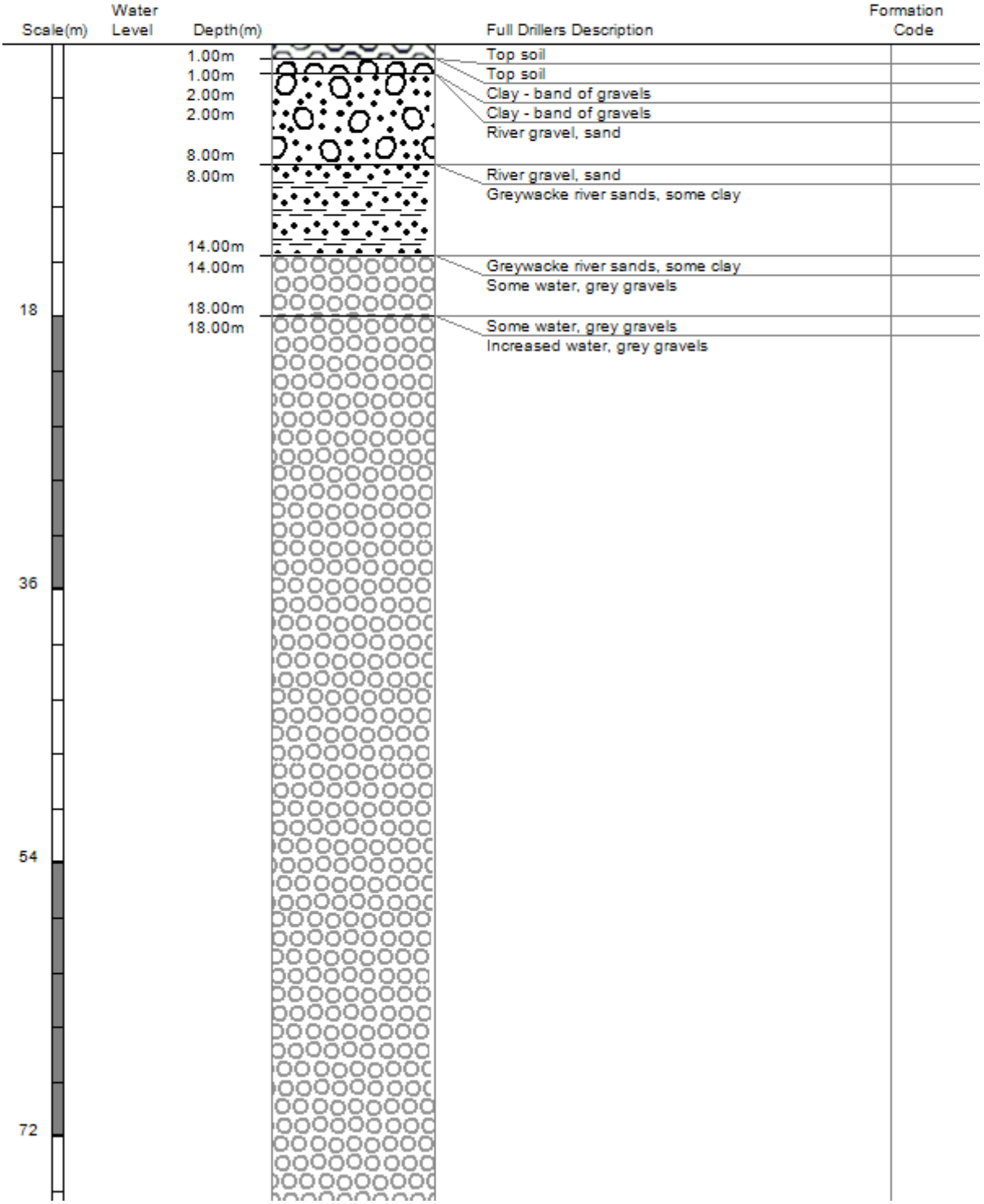
Comment Date	Comment
19 Mar 2010	Gridref changed from: M36:6266-3237 to M36:6268-3236 BCP confirms

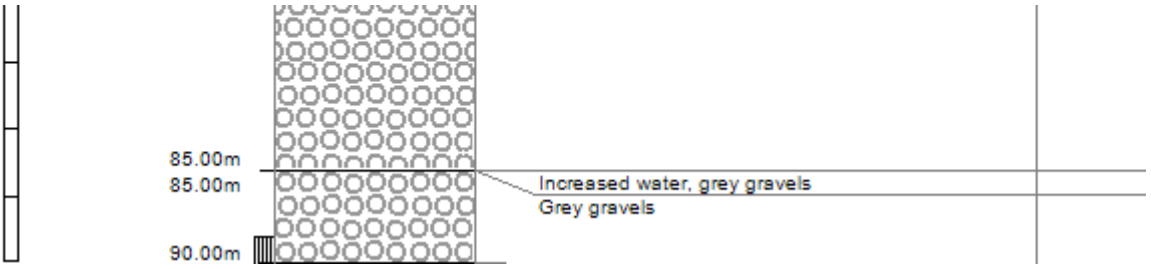
Bore Log

Borelog for well M36/8299

Grid Reference (NZTM): 1552687 mE, 5170751 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 34.0 m +MSD Accuracy: < 0.5 m
Driller: Giltrap Drilling
Drill Method: Rotary Rig
Borelog Depth: 90.0 m Drill Date: 20-Feb-2008

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha




85.00m
85.00m
90.00m
Increased water, grey gravels
Grey gravels

Bore or Well No	M36/8300
Well Name	SELWYN ROAD
Owner	Mr & Mrs G J & B A Scurr

Well Number	M36/8300	**File Number**	CO6C/24910
Owner	Mr & Mrs G J & B A Scurr	**Well Status**	Active (exist, present)
Street/Road	SELWYN ROAD	**NZTM Grid Reference**	BX23:52676-70960
Locality	BROADFIELDS	**NZTM X and Y**	1552676 - 5170960
Location Description		**Location Accuracy**	10 - 50m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	42.00m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	14.00m below MP
Measuring Point Description	ToC	**Highest Water Level**	
Measuring Point Elevation	35.29m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 5 m	**First reading**	
Ground Level	0.60m below MP	**Last reading**	
Strata Layers	5	**Calc Min 80%**	12.33m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	0
Drill Date	25 Feb 2008	**Max Tested Yield**	
Driller	Giltrap Drilling	**Drawdown at Max Tested Yield**	
Drilling Method	Rotary Rig	**Specific Capacity**	
Casing Material	Steel	**Last Updated**	19 May 2010
Pump Type		**Last Field Check**	
Water Use Data	Yes		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	39	40.5				

No step tests for this well

Comments

Comment Date	Comment
19 Mar 2010	Gridref changed from: M36:6262-3256 to M36:6267-3257 BCP confirms

Bore Log

Borelog for well M36/8300

Grid Reference (NZTM): 1552677 mE, 5170961 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 34.7 m +MSD Accuracy: < 0.5 m
Driller: Giltrap Drilling
Drill Method: Rotary Rig
Borelog Depth: 42.0 m Drill Date: 25-Feb-2008

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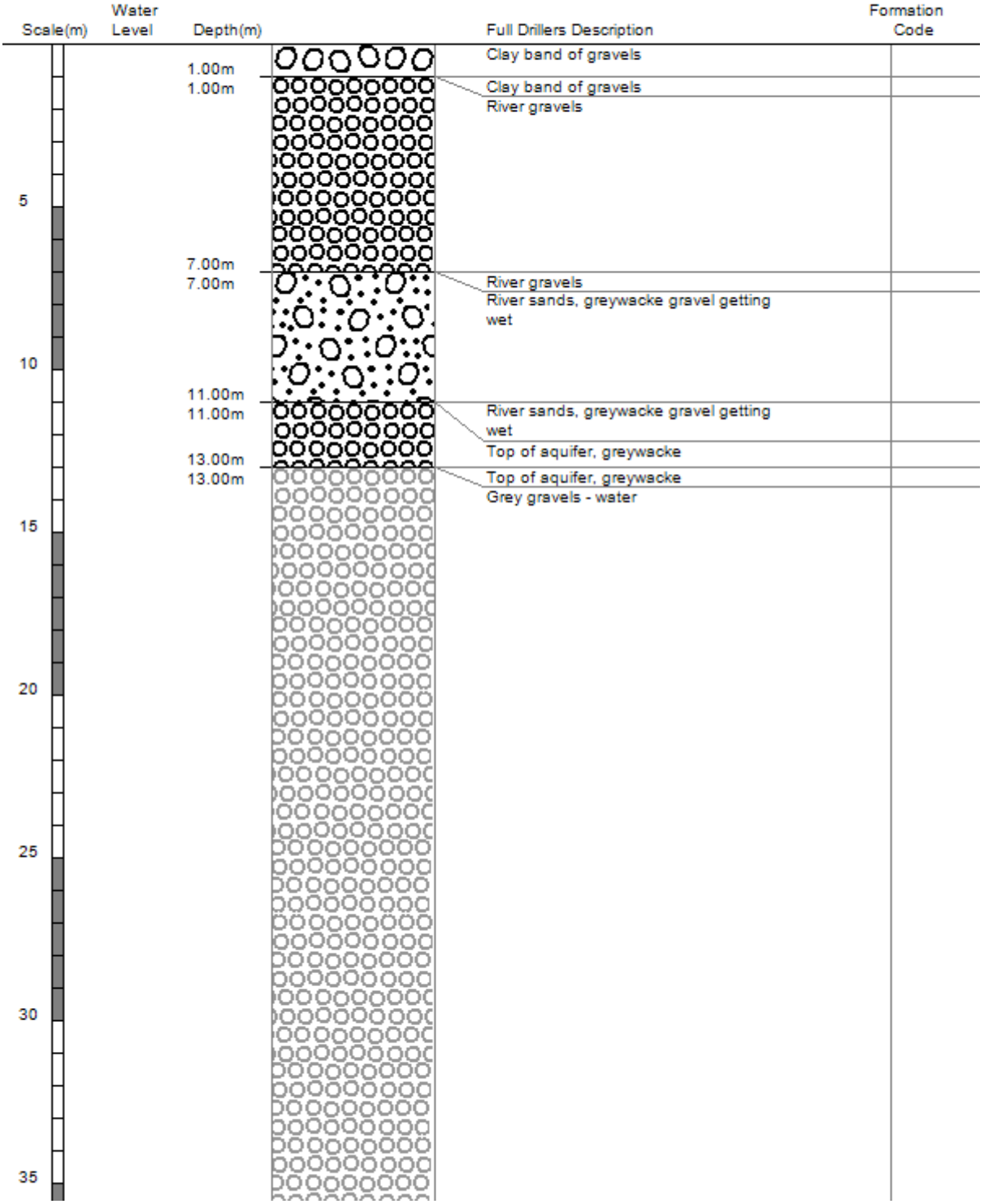



40
42.00m

Bore or Well No	M36/8392
Well Name	572 SELWYN ROAD
Owner	A J LLOYD

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M36/8392	**File Number**	CO6C/26653
Owner	A J LLOYD	**Well Status**	Active (exist, present)
Street/Road	572 SELWYN ROAD	**NZTM Grid Reference**	BX23:52567-70574
Locality	SPRINGSTON	**NZTM X and Y**	1552567 - 5170574
Location Description		**Location Accuracy**	2 - 15m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	36.00m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	10.00m below MP
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	34.26m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	5	**Calc Min 80%**	11.83m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	1
Drill Date	12 Jun 2007	**Max Tested Yield**	2 l/s
Driller	Daly Water Wells Ltd	**Drawdown at Max Tested Yield**	11 m
Drilling Method	Rotary Rig	**Specific Capacity**	0.18 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	36				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
12 Jun 2007	1	2	26.396368	11	0

Comments

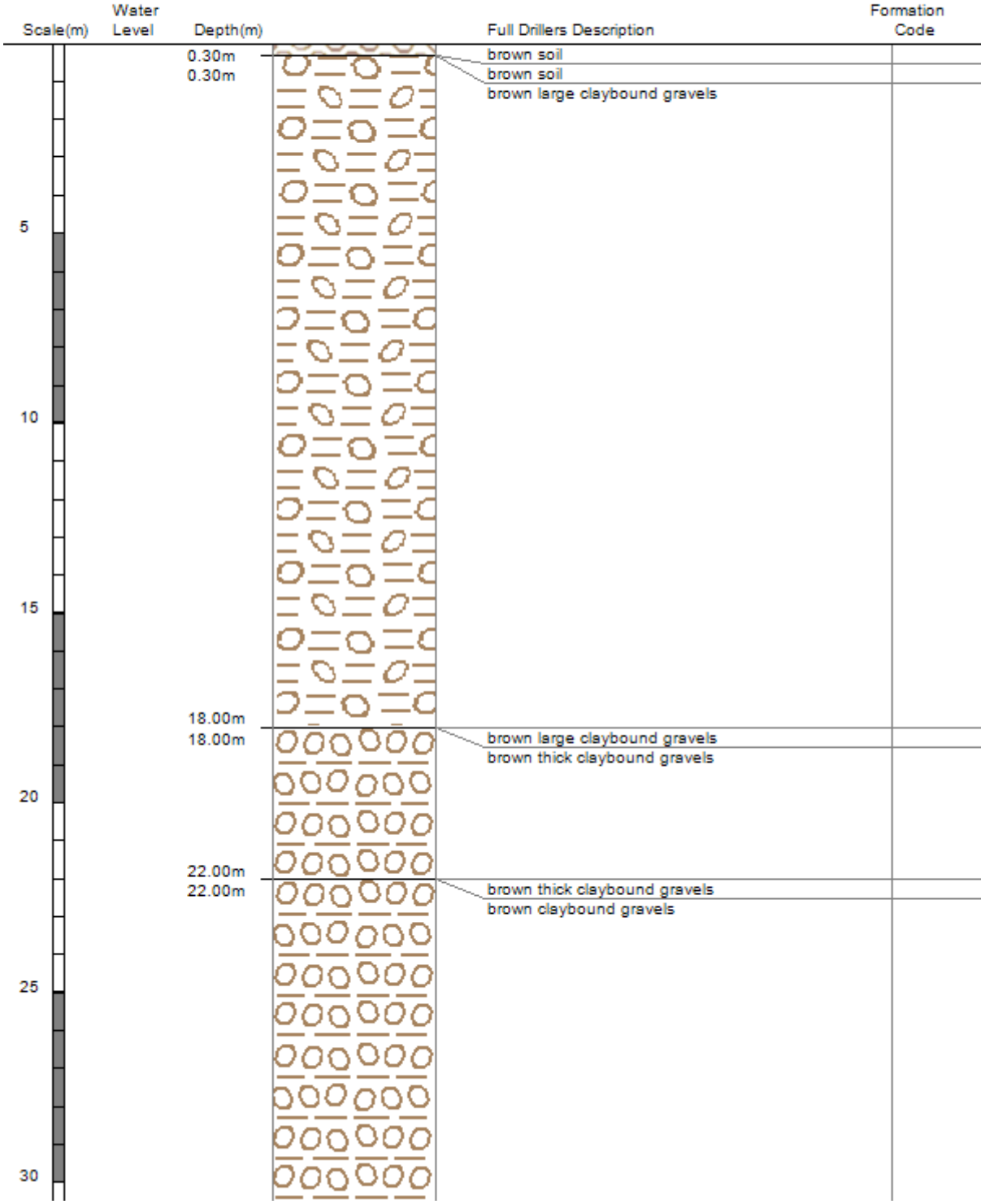
Comment Date	Comment
20 Sep 2007	Gridref changed from: M36:6247-3217, BCR confirms
12 Nov 2007	Gridref changed from: M36:6255-3216. New gridref from plan in BCR
09 Jun 2009	Gridref changed from: M36:62572-32149 - Site visit 5 June 09, location GPS'd

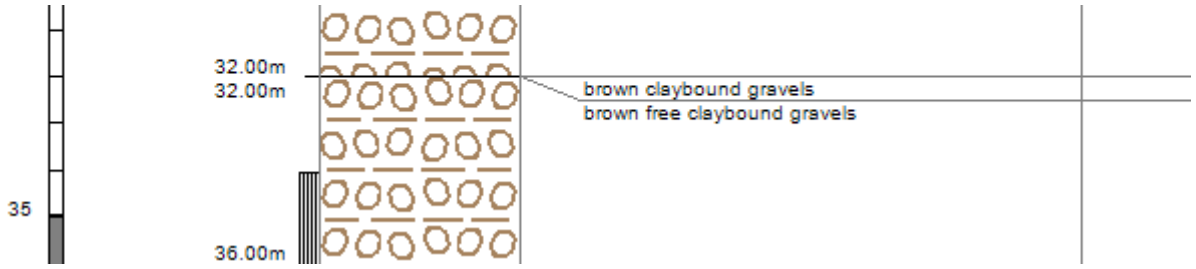
Bore Log

Borelog for well M36/8392

Grid Reference (NZTM): 1552568 mE, 5170575 mN
Location Accuracy: 2 - 15m
Ground Level Altitude: 34.3 m +MSD Accuracy: < 0.5 m
Driller: Daly Water Wells Ltd
Drill Method: Rotary Rig
Borelog Depth: 36.0 m Drill Date: 12-Jun-2007

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha




35
32.00m
32.00m
36.00m
brown claybound gravels
brown free claybound gravels

APPENDIX 3:

Site Plan and Subsurface Investigation

Legend

- Site Boundary
- 2020 Plan Change Testing (ENGEO)
- 2022 Test Pit Excavations
- 2022 Hand Auger Tests

0 50 m 100 m

ENGEO

Produced by **Datanest.earth**

Title: Site Plan and Investigation Locations		
Client: Urban Estates		
Project: Broadfield Grange	Drawn: JRW	Figure No: 1
Date: 15-06-2022	Checked: DEB	Size: A4
Proj No: 18991.000.001_4	Scale: 1:3000	Version: draft

LOG OF TEST PIT TP01

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Date : 02/06/2022
Max Test Pit Depth : 2.3 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 400 mm

Shear Vane No :
Logged By : Cw/JC
Reviewed By : JRW
Latitude : -43.61701940326
Longitude : 172.41185556437

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0	TS		SM	Silty fine to medium SAND and trace rootlets; brown. Poorly graded [TOPSOIL].				D	-		
	ALLUVIUM		SM	Silty fine to medium SAND with trace gravel; light brown. Poorly graded.					MD		
0.5				Sandy fine to coarse GRAVEL with trace cobbles; brownish grey. Well graded. Subrounded to subangular. Sand, fine to coarse. Well graded.							
1.0											
1.5			GW					M	Tightly Packed		
2.0											
2.5				Depth of Excavation: 2.3 m Termination Condition: met target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 (>>)

Borehole met target depth at 2.3 m depth .
met practical refusal
Standing groundwater was not encountered
TS=TOPSOIL

TS=TOPSOIL

LOG OF TEST PIT TP02

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Date : 02/06/2022
Max Test Pit Depth : 2.4 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 400 mm

Shear Vane No :
Logged By : JC/CW
Reviewed By : JRW
Latitude : -43.616459647077
Longitude : 172.41047406583

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0	TS		SM	Silty fine to medium SAND with trace gravel; brown. Poorly graded [TOPSOIL].				D	-		
	ALLUVIUM		SM	Silty fine to medium SAND with trace gravel; light brown. Poorly graded.					MD		
0.5				Sandy fine to coarse GRAVEL with trace cobbles; brownish grey. Well graded. Subrounded to subangular. Sand, fine to coarse. Well graded.							
1.0											
1.5			GW					M	Tightly Packed		
2.0											
2.5				Depth of Excavation: 2.4 m Termination Condition: met target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 (>>)

undefined met target depth at 2.4 m depth .
met practical refusal
Standing groundwater was not encountered
TS=TOPSOIL

TS=TOPSOIL

LOG OF TEST PIT TP03

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Date : 02/06/2022
Max Test Pit Depth : 2.6 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 400 mm

Shear Vane No :
Logged By : CW/JC
Reviewed By : JRW
Latitude : -43.615517788612
Longitude : 172.4108900288

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0	TS		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand, fine to medium. Poorly graded [TOPSOIL].					-		
	ALLUVIUM		SM	Silty fine to medium SAND with trace gravel; light brown. Poorly graded.					MD		
0.5			GW	Sandy fine to coarse GRAVEL with trace cobbles; brownish grey. Well graded. Subrounded to subangular. Sand, fine to coarse. Well graded.				M	Tightly Packed		
1.0											
1.5											
2.0											
2.5				Depth of Excavation: 2.6 m Termination Condition: met target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 >>

undefined met target depth at 2.6 m depth .
met practical refusal
Standing groundwater was not encountered
TS=TOPSOIL

TS=TOPSOIL

LOG OF TEST PIT TP04

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Date : 02/06/2022
Max Test Pit Depth : 2.3 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 400 mm

Shear Vane No :
Logged By : CW/JC
Reviewed By : JRW
Latitude : -43.61536401997
Longitude : 172.40958556749

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0	TS		SM	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded [TOPSOIL]				D	-		
0.5	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded. Subrounded to subangular. Sand, fine to coarse. Well graded. Cobbles, subrounded to subangular.					Tightly Packed		
2.3				Depth of Excavation: 2.3 m Termination Condition: met target depth				M			

undefined met target depth at 2.3 m depth .
met practical refusal
Standing groundwater was not encountered
TS=TOPSOIL

TS=TOPSOIL

LOG OF TEST PIT TP05

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Date : 02/06/2022
Max Test Pit Depth : 2.5 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 400 mm

Shear Vane No :
Logged By : CW/ JC
Reviewed By : JRW
Latitude : -43.614830032536
Longitude : 172.40905809273

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0.0	TS		SM	Silty fine to medium SAND with trace rootlets; brown. Poorly graded [TOPSOIL]					-		
0.3	ALLUVIUM		SM	Silty fine to medium SAND with trace rootlets; light brown. Poorly graded.					MD		
0.5			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded. Subrounded to subangular , fine to coarse. Well graded. Cobbles, subrounded to subangular.				M	Tightly Packed		
2.5				Depth of Excavation: 2.5 m Termination Condition: met target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 >>

undefined met target depth at 2.5 m depth .
met practical refusal
Standing groundwater was not encountered
TS=TOPSOIL

TS=TOPSOIL

LOG OF TEST PIT TP06

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Date : 02/06/2022
Max Test Pit Depth : 2.55 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 400 mm

Shear Vane No :
Logged By : JC/CW
Reviewed By : JRW
Latitude : -43.613871542206
Longitude : 172.40920213943

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm (2 4 6 8 10 12)
0	TS		SM	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded [TOPSOIL].				D	-		
0.5	ALLUVIUM		SM	Silty fine to medium SAND with trace gravel and rootlets; light brown. Poorly graded.					MD		
1.0			GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded. Subrounded to subangular. Sand, fine to coarse. Well graded. Cobbles, subrounded to subangular.				M	Tightly Packed		
1.5											
2.0											
2.5				Depth of Excavation: 2.55 m Termination Condition: met target depth							

undefined met target depth at 2.55 m depth .
met practical refusal
Standing groundwater was not encountered
TS=TOPSOIL

TS=TOPSOIL

LOG OF TEST PIT TP07

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Date : 02/06/2022
Max Test Pit Depth : 2.3 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 400 mm

Shear Vane No :
Logged By : CW
Reviewed By : JRW
Latitude : -43.61330885747
Longitude : 172.40898696182

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0	TS		SM	Silty fine to medium SAND with trace rootlets; brown. Poorly graded [TOPSOIL].					-		
0.5	ALLUVIUM		SM	Silty fine to medium SAND with trace rootlets; light brown with orange mottles. Poorly graded. Rootlets no longer encountered					MD		
1.0			GW	Sandy fine to coarse GRAVEL with minor cobbles and trace boulders; brownish grey. Well graded. Subrounded to subangular. Sand, fine to coarse. Well graded. Cobbles, subrounded to subangular. Less fines for 200mm.				M	Tightly Packed		
1.5				Less fines for 200mm Trace silt encountered from 1.8 m depth							
2.0											
2.5				Depth of Excavation: 2.3 m Termination Condition: met practical refusal							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 >>

undefined met practical refusal at 2.3 m depth due to hole collapse.

Standing groundwater was not encountered

TS=TOPSOIL

TS=TOPSOIL

LOG OF AUGER HA01

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Client Ref. : N/A
Date : 02/06/2022
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No :
Logged By : JC/CW
Reviewed By : JRW
Latitude : -43.617111258606
Longitude : 172.41084747451

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
	TOPSOIL	SM	Silty fine to medium SAND with trace rootlets; brown. Poorly graded [TOPSOIL].				D	-		
	ALLUVIUM	SM	Silty fine to medium SAND; light brown. Poorly graded.					MD		
			End of Hole Depth: 0.3 m Termination Condition: met practical refusal							

0.5

1.0

2 4 6 8 10 12 >>

Hand Auger met practical refusal at 0.3 m depth on inferred gravel.
met practical refusal
Standing groundwater was not encountered

GEOTECH HAND AUGER HAND AUGER LOGS.GPJ NZ DATA TEMPLATE 2.GDT 16/6/22

LOG OF AUGER HA02

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Client Ref. : N/A
Date : 02/06/2022
Hole Depth : 0.9 m
Hole Diameter : 50 mm

Shear Vane No :
Logged By : JC/CW
Reviewed By : JRW
Latitude : -43.616021774451
Longitude : 172.41145793982

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded
	TOPSOIL	ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand, fine to medium. Poorly graded [TOPSOIL].					-	
0.5	ALLUVIUM	SM	Silty fine to medium SAND; light brown with orange mottles. Poorly graded.				M	L - MD	
			Becomes wet and light brown from 0.8 m depth				W		
1.0			End of Hole Depth: 0.9 m Termination Condition: met practical refusal						

Scala Penetrometer

Blows per 100mm

2 4 6 8 10 12

>>

Hand Auger met practical refusal at 0.9 m depth on inferred gravel.
met practical refusal
Standing groundwater was not encountered

GEOTECH HAND AUGER HAND AUGER LOGS.GPJ NZ DATA TEMPLATE 2.GDT 16/6/22

LOG OF AUGER HA03

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Client Ref. : N/A
Date : 02/06/2022
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No :
Logged By : JC/CW
Reviewed By : JRW
Latitude : -43.615261941016
Longitude : 172.41044617985

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded
	TOPSOIL	ML	Sandy SILT with minor rootlets; brown. Low plasticity. Sand, fine to medium. Poorly graded [TOPSOIL].				M	-	
	ALLUVIUM	SM	Silty fine to medium SAND with trace gravel; light brown. Poorly graded.					MD	
			End of Hole Depth: 0.3 m Termination Condition: met practical refusal						

Scala Penetrometer

Blows per 100mm

2 4 6 8 10 12

>>

0.5

1.0

Hand Auger met practical refusal at 0.3 m depth on inferred fill.

Standing groundwater was not encountered

LOG OF AUGER HA04

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Client Ref. : N/A
Date : 02/06/2022
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No :
Logged By : JC/CW
Reviewed By : JRW
Latitude : -43.61593406284
Longitude : 172.41049599847

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
0	TOPSOIL	ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand, fine to medium. Poorly graded [TOPSOIL].				M	-		2 4 6 8 10 12
			End of Hole Depth: 0.3 m Termination Condition: met practical refusal							>>
0.5										
1.0										

Hand Auger met practical refusal at 0.3 m depth on inferred gravel.
met practical refusal
Standing groundwater was not encountered

GEOTECH HAND AUGER HAND AUGER LOGS.GPJ NZ DATA TEMPLATE 2.GDT 16/6/22

LOG OF AUGER HA05

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Client Ref. : N/A
Date : 02/06/2022
Hole Depth : 0.25 m
Hole Diameter : 50 mm

Shear Vane No :
Logged By : CW/JC
Reviewed By : JRW
Latitude : -43.614766221441
Longitude : 172.40984995261

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded
	TOPSOIL	SM	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded [TOPSOIL].				M	-	
	A	SM	Silty fine to medium SAND with trace gravel; light brown. Poorly graded.					MD	
			End of Hole Depth: 0.25 m Termination Condition: met practical refusal						

Scala Penetrometer

Blows per 100mm

2 4 6 8 10 12

>>

0.5

1.0

Hand Auger met practical refusal at 0.25 m depth on inferred gravel.
met practical refusal
Standing groundwater was not encountered
A = ALLUVIUM

GEOTECH HAND AUGER HAND AUGER LOGS.GPJ NZ DATA TEMPLATE 2.GDT 16/6/22

LOG OF AUGER HA06

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Client Ref. : N/A
Date : 02/06/2022
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No :
Logged By : CW/JC
Reviewed By : JRW
Latitude : -43.6143765184
Longitude : 172.40931126242

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded
	TOPSOIL	SM	Silty fine to medium SAND with trace rootlets; brown. Poorly graded [TOPSOIL].				D	-	
	ALLUVIUM	SM	Silty fine to medium SAND with trace gravel; light brown. Poorly graded.					MD	
			End of Hole Depth: 0.3 m Termination Condition: met practical refusal						

Scala Penetrometer

Blows per 100mm

2 4 6 8 10 12

>>

0.5

1.0

Hand Auger met practical refusal at 0.3 m depth on inferred gravel.
met practical refusal
Standing groundwater was not encountered

GEOTECH HAND AUGER HAND AUGER LOGS.GPJ NZ DATA TEMPLATE 2.GDT 16/6/22

LOG OF AUGER HA07

Geotechnical Investigation
Broadfield Grange
572 Selwyn Road, Rolleston
18991.001.001

Client : Broadfield Grange LTD
Client Ref. : N/A
Date : 02/06/2022
Hole Depth : 0.25 m
Hole Diameter : 50 mm

Shear Vane No :
Logged By : CW/JC
Reviewed By : JRW
Latitude : -43.613871735403
Longitude : 172.40832743601

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
0	TOPSOIL	SM	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded [TOPSOIL].				M	-		
			End of Hole Depth: 0.25 m Termination Condition: met practical refusal							

Scala Penetrometer: Blows per 100mm — 2, 4, 6, 8, 10, 12; >>

Hand Auger met practical refusal at 0.25 m depth on inferred gravel.
met practical refusal
Standing groundwater was not encountered

GEOTECH HAND AUGER HAND AUGER LOGS.GPJ NZ DATA TEMPLATE 2.GDT 16/6/22

APPENDIX 4:

ECan Boreholes

Bore or Well No	M36/7976
Well Name	SELWYN ROAD
Owner	WEATHERBY ESTATE LIMITED

Well Number	M36/7976	**File Number**	CO6C/23897
Owner	WEATHERBY ESTATE LIMITED	**Well Status**	Active (exist, present)
Street/Road	SELWYN ROAD	**NZTM Grid Reference**	BX23:52386-70950
Locality	BROADFIELD	**NZTM X and Y**	1552386 - 5170950
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**	10.60m below MP
Measuring Point Description	ToC	**Highest Water Level**	
Measuring Point Elevation	37.00m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.40m below MP	**Last reading**	
Strata Layers	11	**Calc Min 80%**	12.04m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	1
Drill Date	24 Aug 2005	**Max Tested Yield**	2 l/s
Driller	Daly Water Wells Ltd	**Drawdown at Max Tested Yield**	3 m
Drilling Method	Rotary Rig	**Specific Capacity**	0.63 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	36				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
24 Aug 2005	1	2	26.396368	3.2	4

Comments

Comment Date	Comment
28 Mar 2006	Gridref changed from: M36:6233-3268

Bore Log

Borelog for well M36/7976

Grid Reference (NZTM): 1552387 mE, 5170951 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 36.6 m +MSD Accuracy: < 2.5 m
Driller: Daly Water Wells Ltd
Drill Method: Rotary Rig
Borelog Depth: 36.0 m Drill Date: 24-Aug-2005

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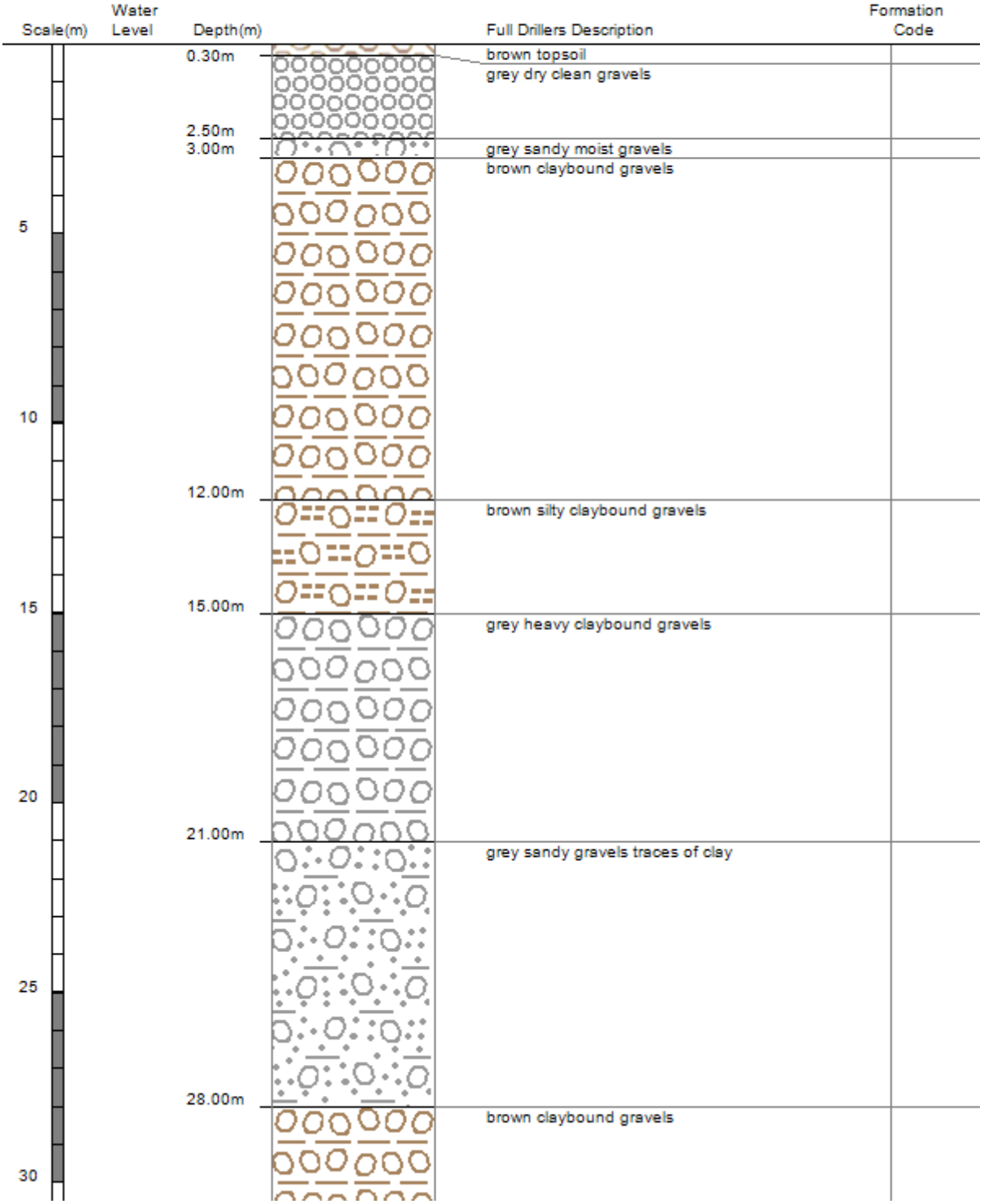

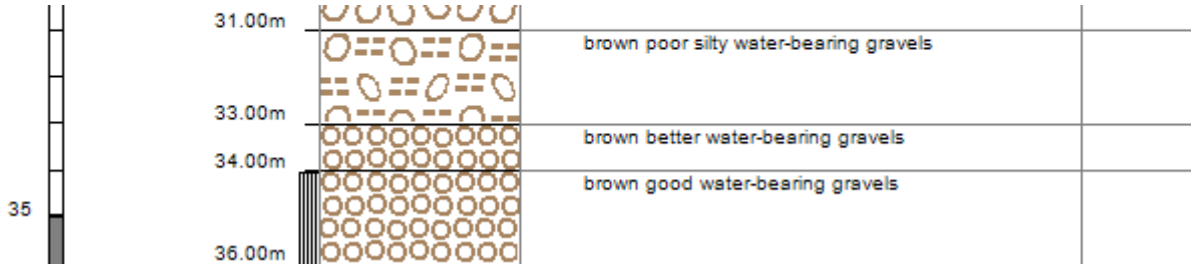
31.00m
brown poor silty water-bearing gravels
33.00m
brown better water-bearing gravels
34.00m
brown good water-bearing gravels
35
36.00m

Bore or Well No	M36/8002
Well Name	SELWYN ROAD
Owner	MR & MRS AT & JM MULCAY

Well Number	M36/8002	**File Number**	CO6C/24021
Owner	MR & MRS AT & JM MULCAY	**Well Status**	Active (exist, present)
Street/Road	SELWYN ROAD	**NZTM Grid Reference**	BX23:52536-70700
Locality	ROLLESTON	**NZTM X and Y**	1552536 - 5170700
Location Description		**Location Accuracy**	50 - 300m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	66.00m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	12.40m below MP
Measuring Point Description	ToC	**Highest Water Level**	
Measuring Point Elevation	36.00m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.30m below MP	**Last reading**	
Strata Layers	13	**Calc Min 80%**	11.96m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	1
Drill Date	28 Oct 2005	**Max Tested Yield**	4 l/s
Driller	Smiths Welldrilling	**Drawdown at Max Tested Yield**	11 m
Drilling Method	Rotary/Percussion	**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	64.5	66				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
30 Oct 2005	1	4.06	53.5846252	11	2

Comments

Comment Date	Comment
04 May 2007	Gridref changed from: M36:6249-3232, original gridref incorrect (on road) still waiting for BCR

Bore Log

Borelog for well M36/8002

Grid Reference (NZTM): 1552537 mE, 5170701 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 35.7 m +MSD Accuracy: < 2.5 m
Driller: Smiths Welldrilling
Drill Method: Rotary/Percussion
Borelog Depth: 66.0 m Drill Date: 28-Oct-2005

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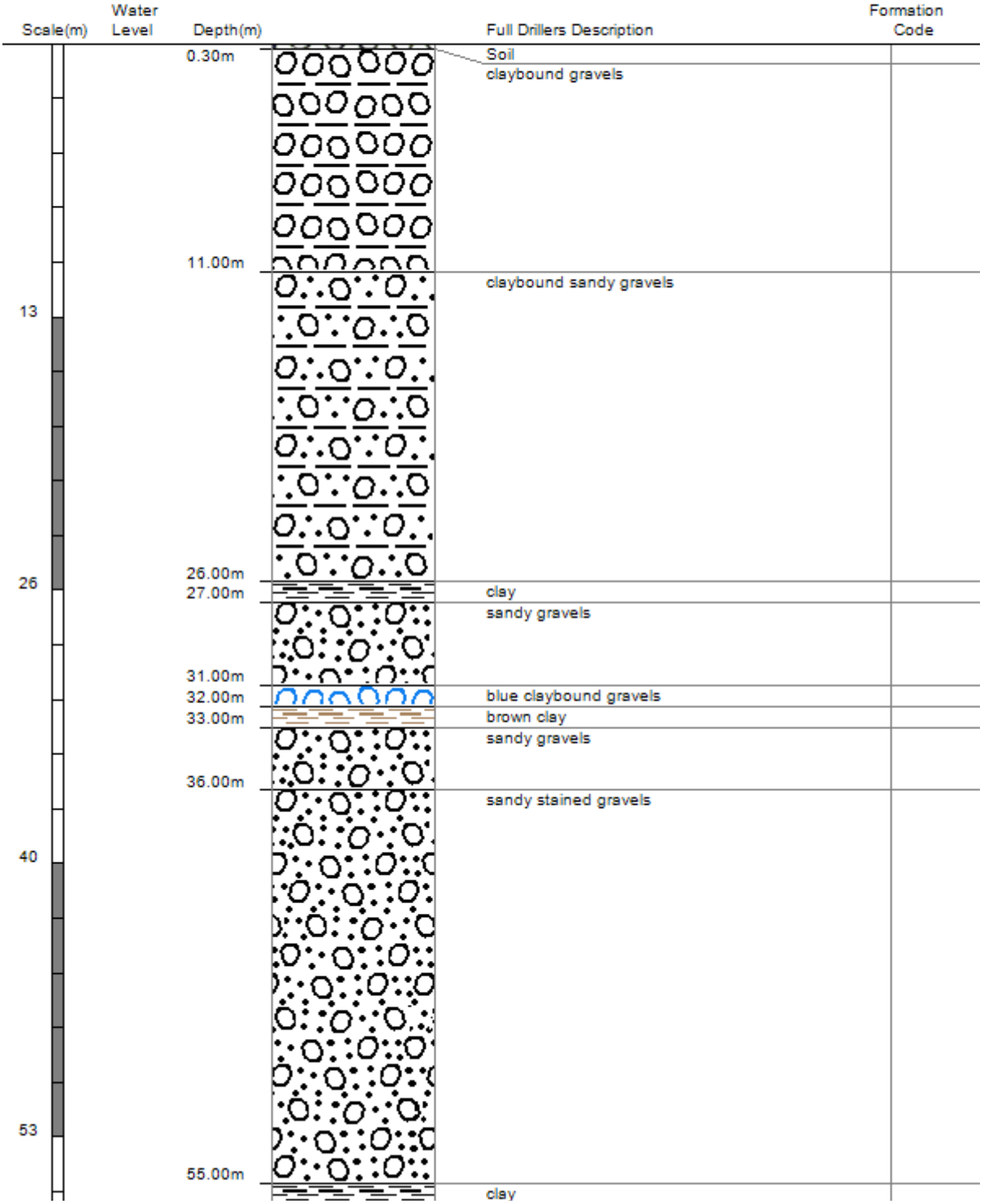

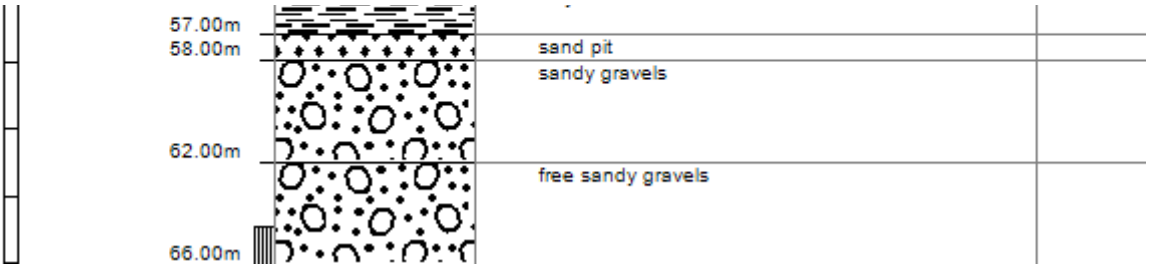
57.00m
58.00m
sand pit
sandy gravels
62.00m
free sandy gravels
66.00m

Bore or Well No	M36/8009
Well Name	SELWYN ROAD
Owner	MR & MRS GC & PM MORGAN

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M36/8009	**File Number**	CO6C/24231
Owner	MR & MRS GC & PM MORGAN	**Well Status**	Active (exist, present)
Street/Road	SELWYN ROAD	**NZTM Grid Reference**	BX23:52356-70860
Locality	BROADFIELD	**NZTM X and Y**	1552356 - 5170860
Location Description		**Location Accuracy**	50 - 300m
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**	12.20m below MP
Measuring Point Description	ToC	**Highest Water Level**	
Measuring Point Elevation	36.18m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 5 m	**First reading**	
Ground Level	0.40m below MP	**Last reading**	
Strata Layers	10	**Calc Min 80%**	11.92m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	1
Drill Date	01 Nov 2005	**Max Tested Yield**	2 l/s
Driller	Daly Water Wells Ltd	**Drawdown at Max Tested Yield**	3 m
Drilling Method	Rotary Rig	**Specific Capacity**	0.63 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	Slotted PVC	34	36				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
01 Nov 2006	1	2	26.396368	3.2	3

No comments for this well

Bore Log

Borelog for well M36/8009 page 1 of 2

Grid Reference (NZTM): 1552357 mE, 5170861 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 35.8 m +MSD Accuracy: < 0.5 m
Driller: Daly Water Wells Ltd
Drill Method: Rotary Rig
Borelog Depth: 36.0 m Drill Date: 01-Nov-2005

Environment Canterbury Regional Council
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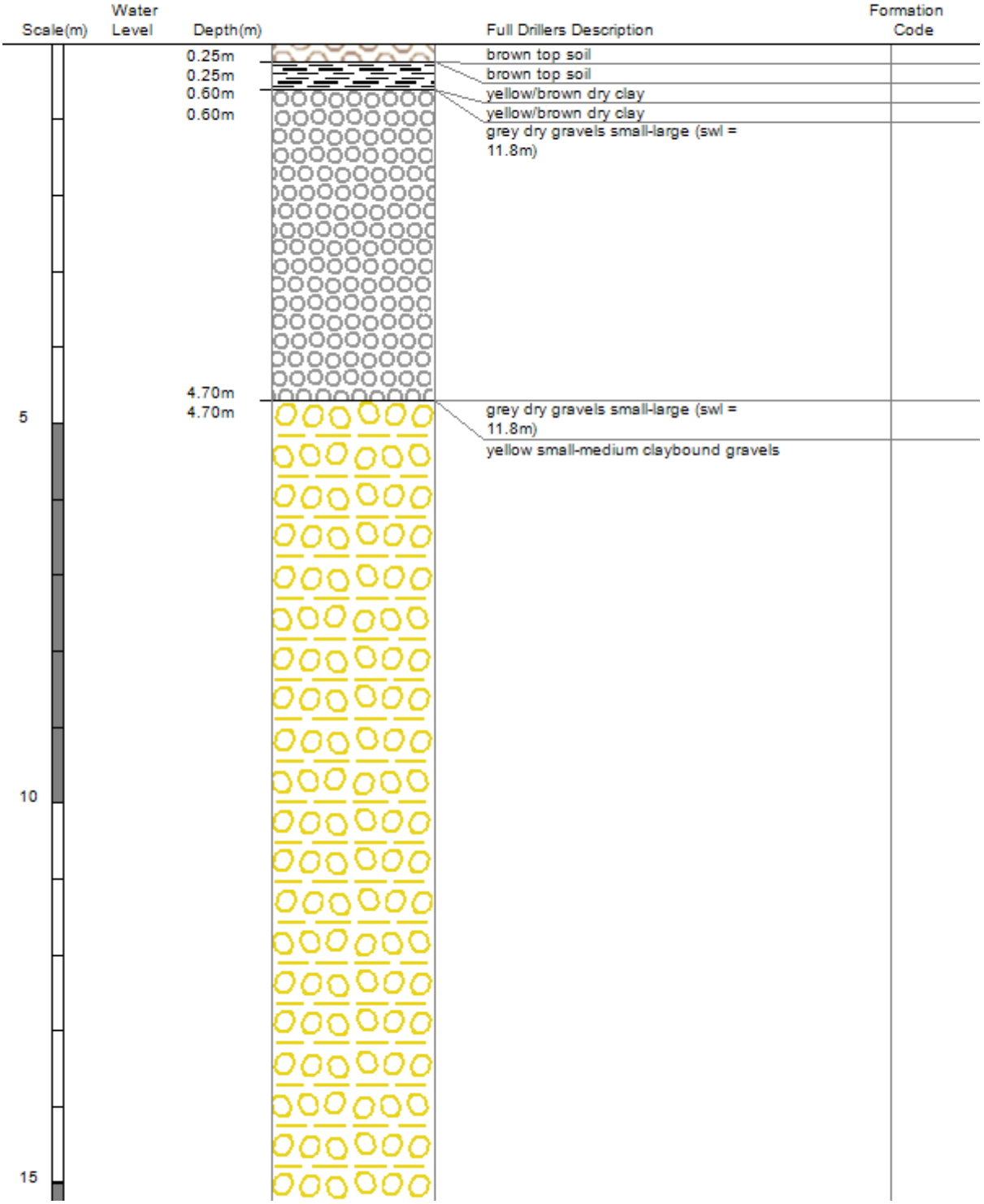

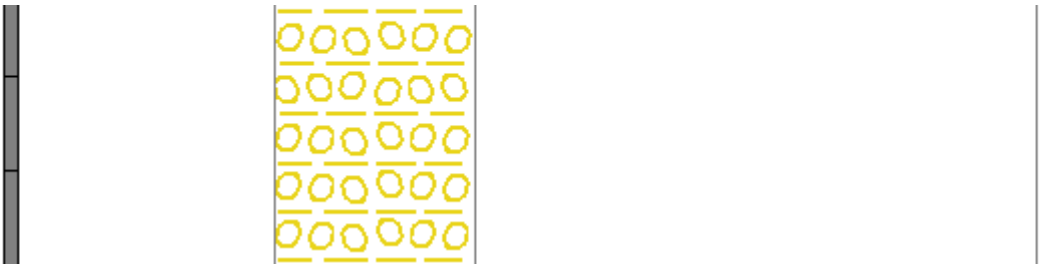

Bore or Well No	M36/8392
Well Name	572 SELWYN ROAD
Owner	A J LLOYD

Environment Canterbury Regional Council
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Well Number	M36/8392	**File Number**	CO6C/26653
Owner	A J LLOYD	**Well Status**	Active (exist, present)
Street/Road	572 SELWYN ROAD	**NZTM Grid Reference**	BX23:52567-70574
Locality	SPRINGSTON	**NZTM X and Y**	1552567 - 5170574
Location Description		**Location Accuracy**	2 - 15m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	36.00m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	10.00m below MP
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	34.26m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	5	**Calc Min 80%**	11.83m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	1
Drill Date	12 Jun 2007	**Max Tested Yield**	2 l/s
Driller	Daly Water Wells Ltd	**Drawdown at Max Tested Yield**	11 m
Drilling Method	Rotary Rig	**Specific Capacity**	0.18 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	36				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
12 Jun 2007	1	2	26.396368	11	0

Comments

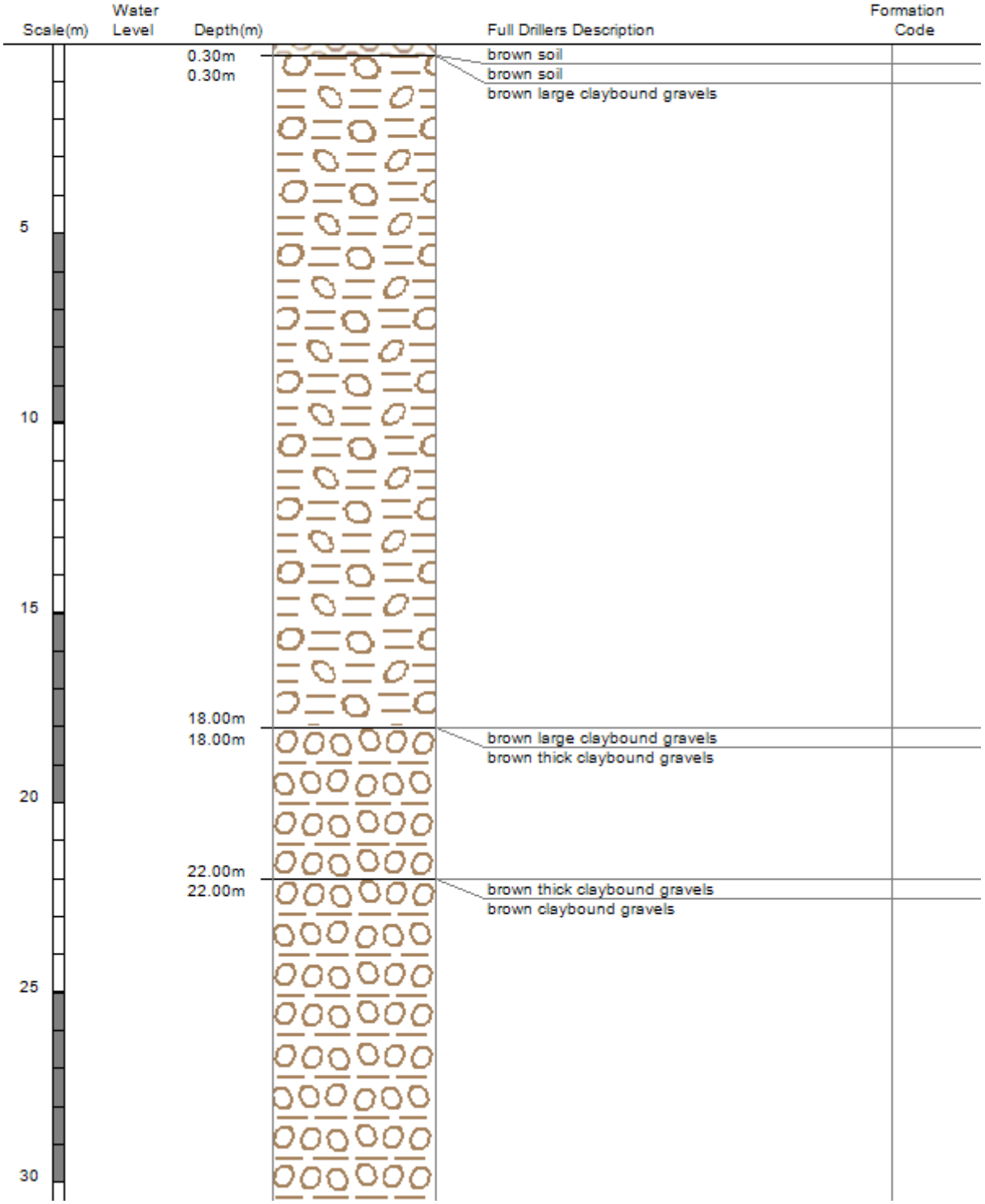
Comment Date	Comment
20 Sep 2007	Gridref changed from: M36:6247-3217, BCR confirms
12 Nov 2007	Gridref changed from: M36:6255-3216. New gridref from plan in BCR
09 Jun 2009	Gridref changed from: M36:62572-32149 - Site visit 5 June 09, location GPS'd

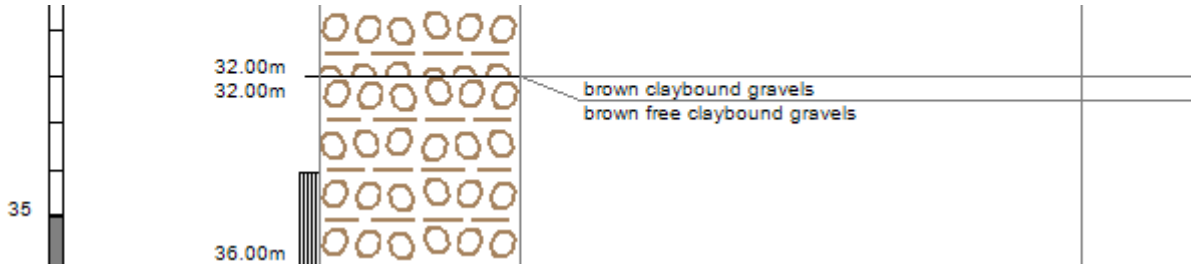
Bore Log

Borelog for well M36/8392

Grid Reference (NZTM): 1552568 mE, 5170575 mN
Location Accuracy: 2 - 15m
Ground Level Altitude: 34.3 m +MSD Accuracy: < 0.5 m
Driller: Daly Water Wells Ltd
Drill Method: Rotary Rig
Borelog Depth: 36.0 m Drill Date: 12-Jun-2007

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha




35
32.00m
32.00m
36.00m
brown claybound gravels
brown free claybound gravels

APPENDIX 5:

Statement of Professional Opinion

Statement of Professional Opinion on the Suitability of Land for Subdivision

(Appendix I to the Infrastructure Design Standard)

Issued by: *ENGEO Ltd*
(Geotechnical engineering firm or suitably qualified engineer)

To: *Broadfield Grange Limited*
(Owner/Developer)

To be supplied to: *Selwyn District Council*
(Territorial authority)

In respect of: *Residential Subdivision*
(Description of proposed infrastructure/land development)

At: *1/572 Selwyn Road (Lot 2 DP 337894)and 4/572 Selwyn Road (Lot 4 DP 337894)*
(Address)

I *(Geotechnical engineer)* *Don Bruggers* on behalf of *(Geotechnical engineering firm)* *ENGEO Ltd*

hereby confirm:

1. I am a suitably qualified and experienced geotechnical engineer and was retained by the owner/developer as the geotechnical engineer on the above proposed development.

2. My/the geotechnical assessment report, dated *16 June 2022* has been carried out in accordance with the Department of Building and Housing *Guidelines for geotechnical investigation and assessment of subdivisions* and includes:
   (i) Details of and the results of my/the site investigations.
   (ii) A liquefaction assessment.
   (iii) An assessment of rockfall and slippage, including hazards resulting from seismic activity.
   (iv) An assessment of the slope stability and ground bearing capacity confirming the location and appropriateness of building sites.
   (v) Recommendations proposing measures to avoid, remedy or mitigate any potential hazards on the land subject to the application, in accordance with the provisions of Section 106 of the Resource Management Act 1991.

3. In my professional opinion, I consider that Council is justified in granting consent incorporating the following conditions:

   As per our Geotechnical Investigation Report dated 16 June 2022 (reference: 18991.001.001_01).

4. This professional opinion is furnished to the territorial authority and the owner/developer for their purposes alone, on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any building.

5. This certificate shall be read in conjunction with my/the geotechnical report referred to in Clause 2 above, and shall not be copied or reproduced except in conjunction with the full geotechnical completion report.

6. The geotechnical engineering firm issuing this statement holds a current policy of professional indemnity insurance of no less than $ *1,000,000*

(Minimum amount of insurance shall be commensurate with the current amounts recommended by IPENZ, ACENZ, TNZ, INGENIUM.)

.....

(Signature of Engineer)

Date: *16/06/2022*

Qualifications and experience: *CMEngNZ (CPEng)*

ENGEO Limited
124 Montreal Street, Sydenham, Christchurch 8023
PO Box 373, Christchurch 8140, New Zealand
T: +64 3 328 9012
www.engeo.co.nz

Project Number 20242.000.001

Soil Validation Report

4/572 Selwyn Road, Rolleston,

Submitted to:
Broadfield Grange Limited

Contents

Tables

Figures

Appendices

ENGEO Document Control:

Report Title	Soil Validation Report - 4/572 Selwyn Road, Rolleston			
Project No.	20242.000.001	**Doc ID**	03	
Client	Broadfield Grange Limited	**Client Contact**	Brad Wilson	
Distribution (PDF)	Broadfield Grange Limited			
Date	**Revision Details / Status**	**Author**	**Reviewer**	**WP**
11/10/2022	Issued to Client	NF	DR	DF

1 Introduction

ENGEO Ltd was requested by Broadfield Grange Limited to undertake a soil validation report of the property at 4/572 Selwyn Road, Rolleston, (herein referred to as 'the site'). During an intrusive environmental investigation, concentrations of arsenic were reported in a burn pile at 4/572 Selwyn Road. The concentrations of arsenic were reported above the NES residential land use, therefore remedial earthworks were required to enable the redevelopment of the site for the residential end use. Validation samples were performed following the removal of the contaminated material from the previously identified areas. Figure 1 appended shows the area of the validation sampling and remedial area.

1.1 Objectives of Site Validation Report

The objective of the validation report is to detail the site works undertaken and provide evidence that the site is suitable for its end use.

The validation report is required to be sent to Selwyn District Council (SDC) and Environment Canterbury to seek acknowledgement that the contaminants of concern relating to the site are below the relevant residential land use standards. Following acknowledgement from SDC that the contamination has been successfully remediated to the appropriate level, it is anticipated that the redevelopment works can continue.

Please note that this report is for the validation of the targeted remediation area only and does not seek to provide a full characterisation of soil across the whole site as this is described in the report produced by ENGEO, 2020.

2 Site Description

The approximately 4 ha site with the legal identifier Lot 4 DP 337894 is situated at 4/572 Selwyn Road, Rolleston. The site has been previously used for grazing and rural residential, with dwellings being on-site since the 1970s.

Site information is summarised in Table 1.

Table 1: Site Information

Item	Description
Location	4/572 Selwyn Road, Rolleston
Legal Description	LOT 4 DP 337894
Site Area	Approximately 4.0 ha
Current Land Use	Rural residential and grazing (sheep / goats)
Proposed Land Use	Residential subdivision, for single dwelling sites with gardens, including home-grown produce consumption (10%).
Territorial Authority	Selwyn District Council
Zoning	Inner Plains

3 Summary of Environmental Investigations and Contaminant Conditions

3.1 ENGEO Preliminary Site Investigation – 572 to 582 Selwyn Road, Rolleston (December 2020)

ENGEO undertook a Preliminary Site Investigation for several sites along Selwyn Road in Rolleston. The PSI report included reviewing information in relation to the sites former and current uses to determine if there was potential for hazardous activities to have contaminated the soils.

The site at 4/572 Selwyn Road was not listed on the Canterbury Regional Councils Listed Land Use Register. The property file review identified that 4/572 Selwyn Road had a residential dwelling constructed in 2008. Prior to residential development the sites were mainly used for pastoral use. During the site walkover a burn off area was identified at 4/572 Selwyn Road.

Table 2: Summary of Environmental Works

Address	Phase	Work required
4/572 Selwyn Road	PSI completed – burn pile area identified	Sampling required from burn pile area.

Please refer to the full PSI report for more information if required.

3.2 ENGEO Detailed Site Investigation – 1/572, 2/572 and 4/572 Selwyn Road, Rolleston (May 2022)

Based on the PSI completed previously for the sites, ENGEO undertook testing at 1/572, 2/572 and 4/572 Selwyn Road. These three sites are proposed to be developed as the first stage of the larger subdivision and therefore a DSI was initially conducted on this area.

Five soil samples were collected from around the burn off area at 4/572 Selwyn Road with analysis for heavy metals and polycyclic aromatic hydrocarbons (PAHs). One sample, SS3, reported arsenic above the NES residential land use criteria with all other samples reporting concentrations of heavy metals below the NES residential land use criteria. Soil sample SS3 was the only sample that reported heavy metals above the site specific regional background levels. PAHs were reported below the laboratory limit of detection in all five samples.

Please refer to the DSI for the summary of sampling and conclusions for the sites at 1/572 and 2/572 Selwyn Road.

The remedial area at 4/572 Selwyn Road is included in Figure 1 below.

Figure 1: Remedial Area

4 Remediation

4.1 Remedial Method

Burn Pile

The preferred remedial method was excavation of the impacted material and disposal off-site. The soil samples collected from the burn pile indicated that the soil was suitable for disposal to Frews Hororata. Remediation was overseen by Natalie Flatman of ENGEO and was undertaken in accordance with the Remedial Action Plan for the site (ENGEO, 2022).

4.2 Validation Sampling

Upon completion of the removal of the burn pile (approximately 5 x 5 m down to 0.2 m in depth) ENGEO undertook validation sampling which included:

- Collection of soil samples from the walls and base of the excavations using a hand trowel. The samples were compressed directly into laboratory supplied containers using a new pair or nitrile gloves for each sample. Prior to sampling, the equipment (hand trowel) was decontaminated using a triple wash procedure with potable water, Decon 90 solution and deionised water;
- Inspection of each sample for visual and olfactory indicators of contamination; and
- Submission of soil samples to RJ Hill Laboratories (Hills) in Hamilton under standard ENGEO chain of custody for analysis of contaminants of concern (heavy metals).

Quality Assurance and Quality Control

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

- Standard sample registers and chain of custody records for the samples;
- The use of Hills, an International Accreditation New Zealand (IANZ) laboratory, to conduct all laboratory analysis. To maintain their accreditation, Hills undertakes rigorous cross checking and routine duplicate sample testing to ensure the accuracy of their results; and
- During the site sampling, every attempt was made to ensure that cross contamination did not occur through the use of the procedures outlined within this document.

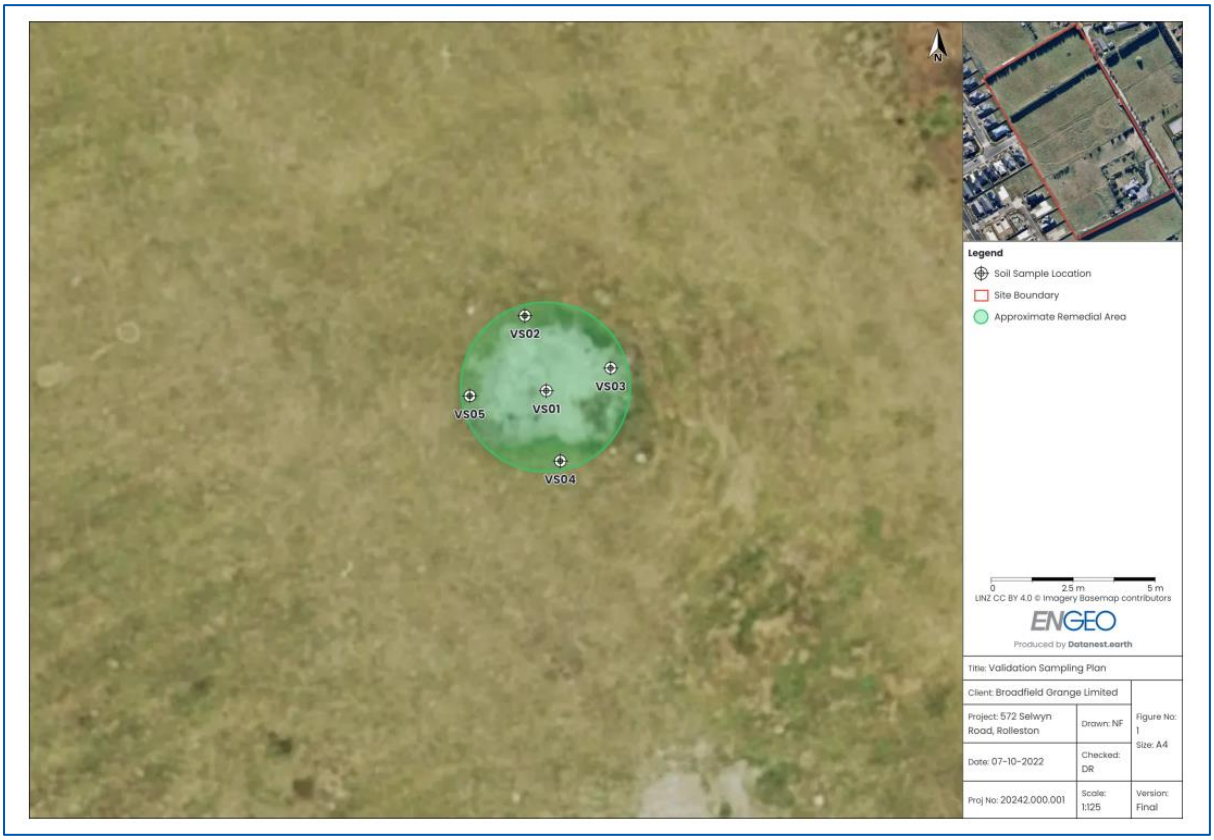
The site photographs below show the remedial area after the excavation of the contaminated material and Figure 3 below shows the sample location plan.

Figure 2: Site Photographs

Photo 1: Remediated burn pile looking southeast

Photo 2: Remediated burn pile looking southwest

Figure 3: Validation Sampling Plan



5 Contractor Documentation

The following documentation was provided by Frews who were involved in with cartage off-site. All waste dockets are provided in Appendix 1.

- Waste manifests issued by Frews indicated that approximately 1.7 tonnes of material were removed from the site and disposed of at Frews Hororata.

6 Adopted Investigation Criteria

The specific criteria referenced in this report have been selected in accordance with the NES and the MfE Contaminated Land Management Guidelines No.2: Hierarchy and Application in New Zealand of Environmental Guideline Values.

Contaminant concentrations in soil were compared to human health criteria for residential land use (10% produce ingestion) as this is the proposed land use of the site following remediation.

7 Site Validation Results

Table 3 compares the soil concentrations in the samples tested with the adopted investigation criteria. Full analytical results are included in Appendix 2.

Discussion of Results

All of the five soil validation samples collected, one from the base and one each from the excavation walls, reported concentrations of heavy metals below the MfE SCS for residential land use and below the site specific regional background levels.

Table 3: Laboratory Analysis Results

Sample Name	VS01	VS02	VS03	VS04	VS05	Human health criteria – Residential land use	Human health criteria - Commercial / industrial outdoor worker (unpaved)[ag]	Regional background - Trace Elements (Level 2)[b]
Date	15/9/2022	15/9/2022	15/9/2022	15/9/2022	15/9/2022			
Soil Type	SILT	SILT	SILT	SILT	SILT			
Sample Depth, m	0.2	0.0-0.2	0.0-0.2	0.0-0.2	0.0-0.2			
Heavy Metals in soil, mg/kg								
Arsenic	4	4	5	4	4	20	70	12.58
Cadmium	<0.10	<0.10	<0.10	<0.10	<0.10	3	1,300	0.19
Chromium[d]	13	13	14	14	13	460	6,300	22.7
Copper	4	4	5	4	4	>10,000	>10,000	20.3
Lead	15.6	15.0	14.9	14.4	15.6	210	3,300	40.96
Nickel	10	10	10	10	10	400	6,000[c]	20.7
Zinc	53	54	56	55	53	7,4000	400,000[c]	93.94

Notes:

Bold text indicates that the concentration exceeds the residential land use criterion.
Italics text indicates that the concentration exceeds the commercial / industrial land use criterion.
Underlined text indicates that the concentrations exceeds the inhalation criterion.
[a] MfE (2012) Human health criteria from the NES except where noted.
[b] ECan (2007) Background Concentrations of Selected Trace Elements in Canterbury Soil Exceedances are shaded.
[d] Criteria for Chromium VI were conservatively selected.

8 Conceptual Site Model

A conceptual site model consists of four primary components. For contaminants to present a risk to human health or an environmental receptor, all four components are required to be present and connected. The four components of a conceptual site model are:

- Source of contamination;
- Pathway(s) in which contamination could potentially mobilise along (e.g. vapour or groundwater migration);
- Sensitive receptor(s) which may be exposed to the contaminants; and
- An exposure route, where the sensitive receptors and contaminants come into contact (e.g. ingestion, inhalation, dermal contact).

The potential source, pathway, receptor linkages at this subject site are provided in Table 4.

Table 4: Conceptual Site Model

Potential Sources	Contaminants of Concern	Exposure Route and Pathways	Receptors	Acceptable Risk? So samples meet acceptance criteria?
Burn pile	Heavy metals	Dermal contact with impacted soil, inhalation of dust and incidental ingestion during earthworks and long term use of the site. Groundwater migration.	Redevelopment workers Future subsurface maintenance workers Future site commercial users Surrounding environment	**Likely.** All samples collected from the Burn Pile area have returned below the NES residential land use criteria.

9 Conclusions

Following the completion of the remedial works outlined in ENGEO's Remedial Action Plan (RAP), ENGEO was engaged by Urban Estates to complete soil validation sampling and reporting for the remedial area to determine if the site is suitable for the proposed residential land use.

A total of five validation samples were collected from the burn pile on-site at 4/572 Selwyn Road after the remedial excavation of impacted soils down to approximately 0.2 m in depth. The soil samples were analysed for heavy metals, with the samples reporting concentrations of heavy metals below the MfE SCS for residential land use and below the site-specific regional background levels.

A waste manifest from Frews indicates that 1.7 tonnes of contaminated soils were excavated from the burn pile and disposed of to Frews Hororata.

Based on our investigation, aforementioned documents and laboratory analysis results, further remediation of the identified areas of concern is not considered to be required and the remediated area of the site is therefore deemed suitable for the intended residential land use.

10 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Broadfield Grange Limited, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface 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.

iv. This Limitation should be read in conjunction with the Engineering NZ/ACENZ Standard Terms of Engagement.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (03) 328 9012 if you require any further information.

Report prepared by

Natalie Flatman

Environmental Scientist

Report reviewed by

Dave Robotham, CEnvP (SC)

Principal Environmental Consultant

11 References

ENGEO (2020). Preliminary Environmental Site Investigation – 572 to 582 Selwyn Road, Rolleston. Ref: 18113.000.001_02.

ENGEO (2022). Detailed Site Investigation – 1/572, 2/572 and 4/572 Selwyn Road, Rolleston. Ref: 20242.000.001_01.

ENGEO (2022). Remedial Action Plan – 4/572 Selwyn Road, Rolleston. Ref: 20242.000.001_02.

ECan (2007) Background Concentrations of Polycyclic Aromatic Hydrocarbons in Christchurch Urban Soils. Report prepared for Environment Canterbury by Tonkin & Taylor Limited, Christchurch, New Zealand. Report Number: R07/19. Tonkin & Taylor Reference: 50875.004.

ECan (2007) Background Concentrations of Selected Trace Elements in Canterbury Soils. Addendum 1: Additional Samples and Timaru Specific Background Levels. Report prepared for Environment Canterbury by Tonkin & Taylor Limited, Christchurch, New Zealand. Report Number R07/1/2. Tonkin & Taylor Reference: 50875.003.

Forsyth, P.J.; Barrell, D.J.A; Jongens, R. 2008: Sheet 16 - Geology of the Christchurch Area 1:250,000. Institute of Geological and Nuclear Sciences, Lower Hutt.

MfE Oct 2011: Ministry for the Environment Hazardous Activities and Industries List.

MfE 2012: Users' guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.

MfE 2011: Contaminated Land Management Guidelines No.2: Hierarchy and Application in New Zealand of Environmental Guideline Values.

MfE 2011: Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils.

National Environmental Protection Council 1999: National Environment Protection Measure Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater.

APPENDIX 1:

Disposal Docket

Frews Quarries Ltd

Plantation Road, Hororata Christchurch
GST: 113 453 222
Docket No : P26379

Vehicle	: FRE697 - FREWS
Charge To	: FREWCO - FREWS
Product	: SPECIAL WASTE (TN)
Order	: 1287 - 572 SELWYN ROAD
Notes	: DRIVE SAFE
Tare	: **16.2 2:03:19 PM 16-Sep**
Gross	: **17.9 2:07:14 PM 16-Sep**
Net	: **1.7**
Delivery	: Supply Only
Printed	: 2:07:14 PM 16/09/2022

Signature:

PH: 03 348 8567
trish@frews.co.nz
www.frews.co.nz

GARY

APPENDIX 2:

Laboratory Certificate

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:	Engeo Limited	**Lab No:**	3077223 SPv1
Contact:	Natalie Flatman C/- Engeo Limited PO Box 373 Christchurch 8140	**Date Received:**	16-Sep-2022
		Date Reported:	21-Sep-2022
		Quote No:	82742
		Order No:	
		Client Reference:	20242.000.001
		Submitted By:	Natalie Flatman

Sample Type: Soil

Sample Name:		VS01 15-Sep-2022	VS02 15-Sep-2022	VS03 15-Sep-2022	VS04 15-Sep-2022	VS05 15-Sep-2022
Lab Number:		3077223.1	3077223.2	3077223.3	3077223.4	3077223.5
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	4	4	5	4	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	13	13	14	14	13
Total Recoverable Copper	mg/kg dry wt	4	4	5	4	4
Total Recoverable Lead	mg/kg dry wt	15.6	15.0	14.9	14.4	15.6
Total Recoverable Nickel	mg/kg dry wt	10	10	10	10	10
Total Recoverable Zinc	mg/kg dry wt	53	54	56	55	53

Summary of Methods

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

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-5
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

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

Testing was completed on 21-Sep-2022. For completion dates of individual analyses please contact the laboratory.

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

Kim Harrison MSc
Client Services Manager - Environmental

Flood Assessment Certificate
FC240141

Issued pursuant to NH-SCHED1 of the Partially Operative Selwyn District Plan.

Property Address:	Broadfield Grange Stage 3
Legal Description:	Lots 26 - 45 and 79 – 82 DP 600834
Date of Issue:	2 April 2024
This certificate is valid until:	2 April 2026

This site is not located on land within a high hazard area.

The site is likely to be subject to inundation in a 200-year Average Recurrence Interval (ARI) flood event.

Minimum finished floor level shall be the following:

Lot 26 only:

+35.60m LVD37

Lots 27 & 28 only:

+35.76m LVD37

Lots 29 & 42 only:

+35.84m LVD37

Lots 30 & 40 only:

+35.91m LVD37

Lots 31, 43 & 44 only:

+35.99m LVD37

Lot 32 only:

+36.08m LVD37

Lots 33, 34 & 35 only:

+36.20m LVD37

Lot 36 only:

+36.15m LVD37

Lots 37 & 39 only:

+36.00m LVD37

Lot 38 only:

+36.02m LVD37

Lot 41 only:

+35.90m LVD37

Lot 45 only:

+35.69m LVD37

Lot 79 only:

+35.43m LVD37

Lot 80 only:

+35.38m LVD37

Lot 81 only:

+35.33m LVD37

Lot 82 only:

+35.30m LVD37

Disclaimers:

1. Whether the site is likely to be subject to inundation in a 200-year ARI flood event, and the minimum finished floor level have been determined with reference to:
   (a) The most up to date models and maps held by Selwyn District Council or Canterbury Regional Council;
   (b) Any relevant field information; and
   (c) Any site specific flood assessment prepared by a suitably qualified and experienced person, including a site specific Flood Hazard Assessment prepared by Canterbury Regional Council.
2. This certificate is based on the best information available to Selwyn District Council at the time the certificate was issued. This information is subject to change and may be updated at any time, including during the valid period of this certificate. Selwyn District Council accepts no liability for changes in this information.
3. This certificate relies on flood modelling. Flood modelling is a tool that predicts what might happen in a flood event of a given magnitude. A flood model uses hypothetical scenarios and makes assumptions about how a flood event might unfold however there are many more variables that can influence how a site is affected in an actual flood event. The minimum finished floor level does not infer that no damage will occur to a structure built above the minimum finished floor level in a flood event.
4. The Building Act 2004 also manages flood risk. The minimum floor level certified under the Partially Operative District Plan may be different to the floor level required by the Building Act 2004, which must be met in order to obtain a building consent.

5. Any activity or construction carried out on a site where a Flood Assessment Certificate is issued is carried out at your own risk, and Council recommend that you carefully consider the impact of any flooding risk associated with this site.

Advice notes:

a) For a new residential unit or principal building or the alteration of, or addition to any residential unit or principal building to be a permitted activity under the Selwyn District Plan as a whole, all other relevant rules must be complied with.

b) If the certified level is for a particular location on the site, the certified level is the minimum floor level for the proposed building location shown on the attached plan. If you wish to build elsewhere on the site the minimum floor level may be different, and you will need to request another certificate for the new location.

c) For the purposes of this certificate, ground level means:

   a. The actual finished surface level of the ground after the most recent subdivision that created at least one additional allotment was completed (when the record of title is created);

   b. If the ground level cannot be identified under paragraph (a), the existing surface level of the ground;

   c. If, in any case under paragraph (a) or (b), a retaining wall or retaining structure is located on the boundary, the level of the exterior surface of the retaining wall or retaining structure where it intersects the boundary.

d) You must reference this certificate when applying for a building consent or the building consent will not be accepted.

Signed for and on behalf of the Selwyn District Council:

Emma Larsen

Head of Resource Consents

IMPORTANT INFORMATION TO ALL NEW HOME/LAND OWNERS

STREET TREES AND IRRIGATION

The Selwyn District Council would like to make all new home/land owners and their contractors aware of the process of gaining approval to relocate/remove street trees, or alter Council irrigations systems.

In some areas of the Selwyn District, various types of linked dripper irrigation systems are installed to water establishing street trees. In some cases, the system has not been installed very deep in the ground. It is particularly important that any contractors who are going to be excavating within road berms are aware of this and excavate carefully to locate irrigation lines or drippers, or seek assistance from Council as to their presence/location before excavating. Similarly, care should be taken when excavating near street trees to avoid damage to tree roots.

The developer has put a lot of effort into enhancing the streetscape and providing an attractive environment within your subdivision. It is accepted that in some cases when a new home is built, a planted street tree and associated irrigation system may need to be shifted or removed to facilitate vehicle access to the site. Upon formal request, Council will consider giving approval for such changes to the initial planting plan or irrigation system on a case by case basis, after exploring all alternative options available.

Where is has been qualified that trees can be removed or relocated and/or an irrigation system needs to be shifted, then these works are to be organised by Council and/or the Developer and carried out by one of their approved contractors. All costs associated with these works are to be borne by the requesting land owner.

Please be aware, that in some situations, street trees can be removed and landscaping in a subdivision might still be under the management of the developer. In such cases, Council should still be contacted in the first instance, who will forward the request onto the developer for a response.

The following procedure is to be followed by a land owner who is wanting to request removal or relocation of a street tree and/or associated irrigation systems, in order to facilitate vehicle accessto their property.

Requests for the removal or shifting of a tree must be made in writing to the Council Reserves Department stating:

- Street address of the property and the lot number;
- Name of the contact person;
- Contact details;
- Reason for the tree to be removed

On receipt of this formal request, Council staff will assess the following:

- Quality of the tree and whether or not the tree can successfully be moved;
- Whether an irrigation system is present and also needs shifting or decommissioning;
- Any conditions of sale by the developer;
- Any Resource Consent conditions;
- Streetscape theme and amenity value contribution of the tree.

If a tree is not able to be shifted and has to be removed, the landowner may also be required to pay for the cost to plant another tree of the same species and of similar size within the road berm as a replacement.

If an agent of the land owner makes the request to Council, then the agent is deemed to the person responsible for the payment of all expenses relating to this procedure.

CARE FOR ESTABLISHING STREET TREES

Although the Developer and/or Council endeavours to water in newly planted street trees during their initial establishment years, the public is encouraged to assist with watering trees on your road berm. Establishing a tree in an urban environment faces many challenges so give your tree the best chance of reaching its full potential and value.

Council implements an annual programme of street tree inspections and maintenance throughout the district. Street tree maintenance is the responsibility of the Council, who employs a contractor to provide arboricultural services. It is critical that any other tree maintenance required is undertaken by our appointed contractor to ensure consistency in both quality and tree form.

Please contact us by lodging a Service request if you tree requires any tree maintenance.

Thank you for your assistance and co-operation

Reserves Maintenance Staff
Selwyn District Council

Be water wise

Reducing water use is important as Selwyn households tend to be high users of water. Residential properties connected to a Council supply used an average of 1,470 litres of water per day in 2012/13 and 1,386 litres per day in 2011/12. As a comparison, typical household use in New Zealand is around 675 litres per day.

Part of the reason why Selwyn households have higher water consumption is because properties tend to have large sections and over dry summers water use can increase significantly. Additional bores can be added to increase the capacity of Council water supplies, but this is costly and unsustainable.

Over summer, demand for water is much higher than in winter, as people use more water to maintain their lawns. When demand for water is very high during dry summers, water restrictions can be introduced if necessary.

Demand is especially high at the peak times of 6–9am in the morning and 4–9pm in the evening, when people use water for cooking, washing and dishwashers, and often water their lawns at the same time.

We are asking everyone to be careful about how they use water, especially in summer when there is more demand for water. Some areas like Rolleston and Darfield also pay for their water based on metered use so reducing your water consumption will mean you spend less on water bills.

How much water do you use?

This chart shows the amount of water typically used for different household activities. Once you know where your water is going, you can think about how you could reduce your water use. If your water is metered and billed this will help reduce how much you spend on water.

Kitchen—Activity	Water used	Buckets
Dishwashing by Hand	12 to 15 litres per wash	1 – 1½
Dishwasher	20 to 60 litres per wash	2 – 6
Drinking, Cooking, Cleaning	8 litres per person	¾ – 1
Bathroom—Activity	Water used	Buckets
Toilet	4.5 to 11 litres per flush	½–1
Bath	50 to 120 litres (half full)	5 – 12
Shower (8 minutes)	70 to 160 litres per 8 minutes	7 – 16
Handbasin	5 litres	½
Tap Running (Cleaning teeth, washing hands)	5 litres	½
Leaking Tap	200 litres	20
Laundry—Activity	Water used	Buckets
Washing Machine (Front loading)	23 litres per kg of dry clothing	4 – 5
Washing Machine (Top Loading)	31 litres per kg of dry clothing	5 – 6
Outside—Activity	Water used	Buckets
Hand Watering by Hose	600 to 900 litres per hour	60 – 90
Garden Sprinkler	Up to 1500 litres per hour	150
Car Wash with Hose	100 to 300 litres	10 – 30
Filling Swimming Pool	20,000 to 50,000 litres	2,000–5,000
Leaking Pipe (1.5mm hole)	300 litres per day	30

Tips for managing your water use

You can help manage your water consumption wisely by following these tips:

Your garden and lawn

- Water your garden and lawn every few days rather than every day. Wetting the soil surface every day encourages roots to develop at the surface, making them more vulnerable to hot dry spells.
- Water your garden and lawn outside of peak water usage hours (avoid 6am–9am, and 4pm–9pm). Watering in the early morning (before 6am) or late evening (after 9pm) will minimise evaporation loss. Also avoid watering in a Nor' West wind as the water will quickly evaporate.
- Using a watering can or hand watering plants by hose often uses far less water than a sprinkler.
- Use a timer to avoid overwatering as it makes plants more susceptible to fungus diseases and will leach out soil nutrients.
- Use mulch or cover the soil with a layer of organic matter to keep the soil moist. Mulches help protect plant roots from drying effects of sun and wind and also reduce weed growth.
- Check if the soil needs watering by digging down with a trowel and having a look. This is a more accurate way to see if watering is needed than looking at the surface.
- Check you have the right head for your sprinkler. Sprinklers should apply water gently so that it seeps into the soil. Some sprinklers apply water faster than the soil can absorb.
- When planting choose drought resistant plants that don't require a lot of water.

Outdoors

- Wash your car with a bucket of water rather than a hose.
- Use a broom rather than hosing down paths and driveways.
- Inspect hoses and taps both indoors and outdoors to check for leaks which waste water.
- Collect rainwater for use watering gardens and lawns.
- If you have a swimming pool, keep it covered to stop the water evaporating.

Indoors

- Reduce your water consumption at the peak times of 6-9am and 4-9pm. Easy ways to do this include using your washing machine after 9pm at night, and putting your dishwasher on just before you go to bed.
- Take a short shower instead of a bath.
- Don't switch on the dishwasher or washing machine until you have a full load.
- Use a half flush when using the toilet.