

Fast Track Application – 531 & 535 Mill Road, Ōhoka – Groundwater Assessment of Environmental Effects Report

✦ Prepared for

Carter Group Limited

✦ 25 May 2026



PATTLE DELAMORE PARTNERS LTD
Level 2, 134 Oxford Terrace
Christchurch Central, Christchurch 8011
PO Box 389, Christchurch 8140, New Zealand

Tel +64 3 345 7100
Web www.pdp.co.nz



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Quality Control Sheet

TITLE Fast Track Application – 535 Mill Road, Ōhoka – Water Supply Assessment of
Environmental Effects

CLIENT Carter Group Limited

ISSUE DATE 25 May 2026

JOB REFERENCE C045180002

Revision History					
REV	Date	Status/Purpose	Prepared By	Reviewed by	Approved
1	20/01/25	Draft	Nic Love	Carl Steffens	Peter Callander
2	26/03/25	Draft V2	Nic Love	Carl Steffens	
3	5/08/25	Draft V3	Nic Love	Carl Steffens	
4	14/04/26	Draft V4	Nic Love	Carl Steffens	
5	11/05/26	Draft V5	Nic Love	Carl Steffens	
6	25/05/26	Final	Nic Love	Carl Steffens	Peter Callander

DOCUMENT CONTRIBUTORS

Prepared by

SIGNATURE



Nic Love

Reviewed by

SIGNATURE



Carl Steffens

Approved by



Peter Callander

Limitations:

This report has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Carter Group Limited and others (not directly contracted by PDP for the work), including Inovo, Tetra Tech Coffey Limited, Waimakariri District Council and Environment Canterbury. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

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Executive Summary

Carter Group Limited (Carter Group) is proposing to subdivide a 154.4 ha area of land at 531 and 535 Mill Road, Ōhoka, for residential and commercial use. The existing Waimakariri District Council (WDC) community water supply at Ōhoka does not have capacity to service the majority of the new development, although there is capacity to service the development's Stage 1 residential and commercial areas. Therefore, it is proposed to utilise the existing township capacity to service these Stage 1 developments, while a new drinking-water supply will be required for the remainder of the subdivision. Carter Group Limited is applying for resource consent for the proposed new water supply and Pattle Delamore Partners Limited (PDP) has carried out technical assessments to confirm the potential environmental effects.

The subdivision will also require a land drainage system to be installed beneath the road kerbs and adjacent swales to protect the roads from high groundwater conditions. Consent is also required to take, use and discharge groundwater for land drainage and PDP has carried out environmental assessments relating to the drainage system.

The current WDC Ōhoka reticulated water supply is principally sourced from bore BW24/0262, located in close proximity to the proposed subdivision. Bore BW24/0262 has a screened intake zone from 78.0 to 84.0 m bgl. A backup emergency supply bore (M35/5609) is also owned by WDC and has a screened intake zone from 16.8 – 18.8 m bgl. However, this bore is not routinely used as its shallow depth makes it vulnerable to *E. coli* contamination. The proposed new supply will be via a deep source, expected to be of similar depth to BW24/0262.

Most abstraction bores in the area are shallow (less than 30 m deep) and therefore there is limited available information to confirm the potential yield that can be expected from new deep bores at the site. The best source of information is the existing WDC community supply bore BW24/0262, where a long-term sustainable yield for the bore of 13 L/s has previously been estimated. As a result, it is assumed that the new deep supply bores will perform similarly to BW24/0262. Aquifer parameters derived from previous testing in BW24/0262 can also be used to assess the potential effects of taking groundwater from the proposed new deep supply bores.

The water demand required for the subdivision is based on existing use data from Ōhoka and other WDC townships, in addition to consideration of the council Code of Practice. Water is also needed for irrigation within the subdivision. Based on the demand required and the performance of BW24/0262, it is assumed that up to five new supply bores will be needed for the new community supply. However, given there is some uncertainty around the potential yield that will be obtained from individual supply bores, it can't be

ruled out that the final number of bores will be more or less than five. The assumed number of bores (and the number that will be drilled during construction) includes the capability to meet peak network demand with one bore offline (N + 1 redundancy). In fact, the total demand and number of bores will be sufficient so that N + 1 redundancy is available for the proposed supply and the existing township supply (not currently the case for the existing Ōhoka supply).

Estimates have been carried out to predict the drainage flows that will occur from the onsite drainage system. It is considered that flows of up to 10 L/s could occur, however this water will all be discharged back to the site with no discharge of groundwater offsite.

There are currently five shallow consented irrigation bores onsite that are authorised to take and use significant quantities of groundwater (more water than is sought under the proposed community supply consent) via two resource consents. These bores will be decommissioned and the existing irrigation consents surrendered once the development is constructed. As a result, there will be a net reduction in groundwater abstracted (and allocated) at the site.

The taking and use of groundwater for community supply purposes is assessed under Rule 5.115 of the Canterbury Land and Water Regional Plan and a condition of this rule is that a Water Supply Strategy is prepared in accordance with Schedule 25 of the plan and submitted with the resource consent application. A copy of the proposed Water Supply Strategy is appended to this report. The activity status for an application under Rule 5.115 is restricted discretionary and therefore effects assessments have been carried out in line with the restricted matters of discretion outlined under the rule.

The taking, use and discharge of groundwater for the land drainage is expected to be authorised under non-consumptive Rule 5.132 of the LWRP. Due to the non-consumptive nature of the drainage system, there is limited potential for environmental effects, however relevant groundwater take and discharge effects assessments have been carried out relative to the drainage system.

The effects assessments relative to the proposed community water supply take have confirmed there will be no adverse impacts on existing groundwater users, including any adverse impacts on their reliability of supply. In fact, there is likely to be a reduction in existing drawdown interference effects in most neighbouring bores due to the surrender of allocation from the existing irrigation consents on the site. These irrigation bores are shallow and their operation (which includes abstraction of large volumes of groundwater) will primarily cause drawdown interference in other shallow pumping bores in the area. Shallow bores are particularly sensitive to drawdown interference effects and therefore there will be a positive effect of shifting abstraction (including a reduction in volumes) from shallow bores to deep bores (which are not as sensitive to drawdown

interference effects). This reduction in effects has been confirmed by assessment using ECan's Land and Water Regional Plan Schedule 12 assessment criteria.

In addition to a reduction in groundwater allocation in the zone (from ceasing abstraction via the shallow irrigation bores), the surrender of allocation from these consents will also reduce surface water depletion leading to a positive impact on the surface water flow regime. The proposed community supply bores will have less hydraulic connection to surface water, due to the intended screen zones being installed within a deep semi-confined aquifer. Assessment of stream depletion using ECan's Land and Water Regional Plan Schedule 9 methodology indicates the hydraulic connection between the proposed bores and surface water is likely to fall into the 'moderate' category (although potentially 'low' based on the percentage of the flow rate that will be sourced from surface water) as defined by ECan. In contrast, most of the existing irrigation bores likely have a 'high' or possibly 'direct' hydraulic connection with surface water. A 'moderate' connection means surface water depletion effects are delayed and therefore there is no benefit in imposing flow restrictions on groundwater takes at times when surface water flow is low.

A Community Drinking-water Protection Zone will need to be adopted around each of the proposed new community supply bores prior to their use. Based on the characteristics of the site and the proposed supply and taking into account the guidance provided in Schedule 1 of the Land and Water Regional Plan, an initial circular zone extending 100 m from each of the bores is considered appropriate. The extents of the zone should be reviewed following pump testing in the new bores. We note that the same size zone has been adopted around existing WDC supply bore BW24/0262.

If the proposed new supply bores are situated at least 100 m from the property boundaries of the site (within the development area), then the protection zones will not encroach on any neighbouring property owner. This would mean there would be no adverse effects of establishing the protection zones by imposing land use restrictions specific to the zones on neighbouring property owners.

The assessments that have been carried out relating to the proposed new community supply have confirmed that the effects of the proposal can be considered less than minor and in fact there are significant positive impacts that will occur.

The non-consumptive nature of the proposed drainage system, the low drainage rates and the localised effects of the system, mean that predicted drawdown interference and stream depletion effects are less than minor. In addition, the same water abstracted via the drains will be discharged onsite and make its way back to shallow groundwater. Therefore, potential water quality effects of the proposed drainage system are also considered less than minor.

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1.0 Introduction

Carter Group Limited (CGL) has engaged Pattle Delamore Partners Limited (PDP) to carry out an Assessment of Environmental Effects (AEE) relating to groundwater related resource consent applications for a proposed subdivision development at Ōhoka. The assessments form part of a proposed Fast-track Consent Application (Fast Track Approvals Act, 2024¹) for the following resource consents:

- ✧ Take and use groundwater for community supply purposes.
- ✧ Take, use and discharge groundwater for land drainage purposes.

It is proposed to subdivide a 154.4 ha area at 531 and 535 Mill Road, Ōhoka, for residential and commercial use. The development area (the site) is located immediately south-west of the existing Ōhoka settlement. The site is bordered by Bradleys Road to the west, Mill Road to the north and Whites Road to the east. The site currently consists predominantly of dry land and irrigated pasture that is mostly used for dairy farming. The topography of the site is generally flat, with a gentle slope towards the east.

Ōhoka Stream crosses the northern area of the site, and various branches of South Ōhoka Stream as well as open drains and channels cross the central and southern parts of the site. Two springs are mapped within the development area (Environment Canterbury (ECan) references M35/7485 and M35/7487) and a further spring (historically referred to as a seep) is also present on the site. In addition, long-term ECan shallow groundwater level monitoring bore M35/0596 is situated near Bradleys Road in the central region of the site.

As part of the development process, regional council consents are required, including for the taking and use of groundwater for community drinking-water supply purposes. The current Ōhoka reticulated water supply owned and operated by Waimakariri District Council (WDC) has approximately 124 connections based on the WDC Activity Management Plan (AMP) 2024 (WDC, 2024²) and is principally sourced from bore BW24/0262 (WDC reference Ōhoka Well No. 2) located approximately 115 m north from the northern site boundary at the intersection of Mill Road and Bradleys Road. Bore BW24/0262 has a deep screened intake zone from 78.0 to 84.0 m below ground level (bgl). A backup emergency supply bore (ECan bore number M35/5609) is also owned by WDC and is situated immediately adjacent to the north-western boundary of the site. This bore has a shallow screened intake zone from 16.8 to 18.8 m bgl, however

¹ Fast Track Approvals Act 2024.

<https://www.legislation.govt.nz/bill/government/2024/0031/6.0/whole.html>

² Waimakariri District Council. (2024). Activity Management Plan 2024 – Water Supply.

we understand the bore is not routinely used as its shallow depth makes it vulnerable to *E. coli* contamination.

The existing town supply does not have capacity to provide the demand for all of the new development and therefore new community supply bores will be required. However, use data indicates there is capacity within the existing town supply to accommodate Stage 1, in addition to the commercial development within the proposed subdivision.

There are four existing shallow bores located on the site which are authorised to take groundwater for irrigation purposes via ECan resource consents CRC991022 and CRC991827. Consent CRC991022 allows for abstraction via bores M35/9423 (this bore was never drilled), M35/3064 (12.5 m deep) and M35/3065 (12 m deep), while consent CRC991827 authorises abstraction via bores M35/0326 (13.7 m deep) and M35/0367 (9.4 m deep). Given the shallow nature of the existing irrigation bores, they are not considered the best option to provide drinking-water to the site and instead new deep supply bores are proposed.

In addition to the proposed community supply take from deep bores, a shallow subsoil drainage system will be installed beneath the roads of the subdivision to protect the road seal at times of elevated groundwater levels. As a result, shallow groundwater will be locally lowered beneath the roads at certain times. This will result in an additional groundwater take during these periods, which will be directed to proposed Stormwater Management Areas (SMAs) located across the subdivision area. The drains will only flow when groundwater elevations exceed the invert level of the drainage system and when the water levels in the SMAs are low enough to create a hydraulic gradient from the drains to the basins. However, any groundwater drained via this system will remain in the basins and not be discharged off site.

This report provides technical assessments to determine the potential environmental effects of abstracting groundwater from proposed deep bores to meet the community supply demand of the new development and determining the effects of taking and discharging shallow groundwater for land drainage purposes.

The location of the proposed subdivision area is shown in Figure 1, Appendix A, along with the locations of existing WDC community water supply bores BW24/0262 and M35/5609 (and their individual Community Drinking-water Supply Protection Zones), the existing onsite irrigation bores, ECan groundwater level monitoring bore M35/0596, existing surface water bodies, in addition to the mapped springs (M35/7485 and M35/7487) and the onsite seep.

This report provides the following information:

- ✧ General site and development details.
- ✧ A summary of the geology and hydrogeology at the site and surrounds.

- ✧ Relevant information regarding the existing Ōhoka community water supply.
- ✧ Relevant information regarding the proposed subsoil drainage system that will be installed beneath the subdivision roads.
- ✧ The community water supply demand to meet the future requirements of the development.
- ✧ Estimated bore requirements to meet the future demand.
- ✧ The expected quantities of groundwater that will be taken and discharged via the subsoil drainage system.
- ✧ Environmental effects assessments to support the relevant consent applications.

This report has been prepared to support the main consent application documents that are being prepared by Inovo. Curricula Vitae for the PDP staff involved in preparing this report are provided in Appendix B.

2.0 Site and Development Details

The proposed development includes:

- ✧ 752 'standard' residential lots,
- ✧ 123 'large lots'
- ✧ 250 Retirement Village units.
- ✧ A 1.49 ha commercial zoned area and
- ✧ A 4.8 ha Polo field will also be developed within the subdivision area.

Stormwater attenuation and flood storage are to be provided by basins (e.g., first flush or attenuation basins) and treatment via wetland storage.

The proposed lot layout and staging plan is shown in Figure 2, Appendix A. Eleven stages are proposed, with development to start in the northern area of the property. The proposed commercial area will occur within Stage 1, the proposed retirement village represents Stage 3 of the development, and the Stage 5 development will be the polo field.

3.0 Geology and Hydrogeology

3.1 Geology

The site is located on the northern Canterbury Plains (i.e. the Waimakariri – Ashley Plains). The Canterbury Plains comprise a series of large coalescing fluvio-glacial fans built by large, braided rivers (e.g. the Rangitata, Rakaia and

Waimakariri) that transported detritus (gravel with sand and silt) eastwards from rapidly rising and eroding mountains in the west. Most of the gravel deposition occurred during successive glaciations, when glaciers partly occupied the inland valleys and extended to the eastern foothills (Brown, 2001³). The GNS geological map of the area (Forsyth *et al.*, 2008⁴) maps the near-surface geology of the site as late Pleistocene brownish-grey river alluvium (Q2a).

Geotechnical investigations at the site carried out by Tetra Tech Coffey generally encountered silt and clayey silt from the ground surface to depths of 0.6 to 1.5 m bgl, underlain by sandy gravel (Tetra Tech Coffey, 2021⁵).

The borelog for the existing Ōhoka drinking-water supply bore BW24/0262 (adjacent to the site) is provided in Appendix C. The log shows gravel dominated strata from near ground level to 21.7 m bgl. However, the matrix of the gravel strata is highly variable, ranging from clayey through silty and sandy, or a mix of finer grain sizes. Therefore, the permeability of the shallow gravel strata may be considerably variable. From 21.7 m bgl, dominantly clay is described in the log to 26.6 m bgl, underlain by clayey gravel to 69.4 m bgl (with a zone of sandy gravel logged from 41.6 m to 44.2 m bgl). From 69.4 m bgl, more permeable sandy gravel and gravel are described to the base of the borehole at 84.7 m bgl.

The log for BW24/0262 indicates that groundwater in deep strata can be expected to be semi-confined based on the presence of the thick clay layer described between 21.7 m and 26.6 m bgl and the variable clayey gravel deposits present at depths above 69.4 m bgl.

3.2 Hydrogeology

On the Waimakariri-Ashley Plains, groundwater is dominantly sourced from infiltrating rainwater (i.e., land surface recharge) across the inland plains (to the north-west (upgradient) of the site), together with some seepage losses from the Ashley and Waimakariri rivers. A map showing the location of the site and the underlying geology within the context of the northern Canterbury Plains is provided in Figure 3, Appendix A.

It should be noted that the strata referred to in this map as QIS2 represents the same strata referred to in the map by Forsyth *et al.*, 2008⁴ as Q2a. This Figure also shows the regional direction of groundwater movement in the area, indicating that groundwater generally flows to the east and south-east, towards

³ Brown, L. J. (2001). Canterbury. In M. Rosen, & P. White (eds), *Groundwaters of New Zealand* (pp. 441-459). New Zealand Hydrological Society Inc., Wellington.

⁴ Forsyth, P., Barrell, D., & Jongens, R. (2008). *Geology of the Christchurch area*. 1:250 000 geological map 16, Institute of Geological & Nuclear Sciences, Lower Hutt.

⁵ Tetra Tech Coffey. (2021). *535 Mill Road, Ōhoka - Geotechnical Assessment Report*. Report reference number 773-CHCGE288040 prepared for Rolleston Industrial Developments Ltd. Dated 1 June 2021.

the coast. Some of the groundwater throughflow also discharges into spring fed streams, including Ōhoka Stream at the site and the Cam River/Ruataniwha to the north-west. Springs in the area (including the onsite springs) represent regional groundwater discharge points and the source of water to the springs is expected to be from a spatially large groundwater catchment that extends a significant distance upgradient from the site.

3.2.1 Groundwater Levels

As per Figure 1, long-term groundwater level monitoring bore M35/0596 is situated in the central part of the site near Bradleys Road. The full groundwater level record in this bore is shown in Figure 4, Appendix A. This bore is 2.9 m deep and has a groundwater level record dating from September 1977 through to present. However, between 1977 and 1986 there are only between one and two measurements per year and there is a gap in the record between 1987 and 1998, with measurements starting again in July 1999. Mostly monthly recordings were made thereafter, until December 2009 when the monitoring frequency changed to daily (likely automated transducer measurements). From May 2012, the frequency changed back to generally monthly measurements. PDP installed telemetry in this bore on 4 June 2025 and therefore there will be a continuous record going forward. This telemetry data is included (up until 14 April 2026) in Figure 4.

The nearest long-term groundwater level record from a deep bore is from bore M35/11918 (70.5 m deep) situated around 2.1 km north-west of the site. Figure 4 also shows the groundwater level record in M35/11918 which starts in November 2009 continuing through to present. The frequency of measurement in this bore is generally monthly.

The record in M35/0596 indicates the water table at the site is shallow, varying between 1.5 m and only 0.22 m bgl at the location of the bore. A seasonal pattern of generally higher levels in late winter and early spring versus lower levels in late summer and early autumn is evident in the data.

The water level data measured in M35/11918 shows larger seasonal fluctuations than in M35/0596, where the lowest recorded groundwater level is 3.26 m bgl and the highest measurement is at ground level. However, we note that M35/11918 is recorded as a domestic and stockwater bore and therefore it is possible the levels in the bore may be influenced by its own pumping. In addition, given the separation distance between M35/11918 and the site, it is not possible to infer that deep groundwater levels at the site will be similar to those measured in this bore. This is because local conditions can influence groundwater levels, for example ground elevations are likely to vary significantly between the sites and the readings in M35/11918 may be influenced by pumping in the bore and/or by other deep groundwater pumping in the area.

In late March 2025, 23 shallow boreholes were drilled at the site by McMillan Drilling Group and groundwater monitoring bores were installed in all 23 of these boreholes. The monitoring bores (P1 through P23) were generally sited at the locations of proposed SMA's and wetlands to provide local groundwater level data to aid in design of these features.

The monitoring bores are typically around 3 m deep, however two of the monitoring bores, P5 and P16, are only 0.65 m and 0.75 m deep respectively. These shallower bores were installed to measure relative levels at different depth zones within the near surface strata. Since installation of the monitoring bores, a number of manual groundwater level monitoring rounds have been carried out and pressure transducers were installed in seven of the monitoring bores in early June 2025. In addition, a further pressure transducer was installed in ECan monitoring bore M35/0596 at the same time, and as noted above, groundwater level telemetry was also set up in the ECan bore. Furthermore, a barometric pressure transducer was installed at the site to record atmospheric pressure fluctuations to allow for compensation of the submerged transducer records.

The locations of the monitoring bores are shown in Figure 5, Appendix A. This figure also shows the locations of the bores fitted with transducers.

The manually measured groundwater level data from the monitoring bores is shown in Figure 6a, Appendix A, along with corresponding manual groundwater level measurements taken in ECan monitoring bore M35/0596. Since the start of the monitoring, groundwater levels in the monitoring bores have varied between very close to ground level (0.01 m bgl) to around 1.4 m bgl, with the exception of the initial measurement from bore P18 on 24 March 2025, where a deeper measurement of 2.28 m bgl was recorded. Subsequent groundwater level measurements in P18 have been more consistent with the range of groundwater level measurements from the remaining bores across the site. To date, the highest manually measured groundwater level measurements were typically in May 2025, recorded following a large rainfall event.

Figure 6b shows the records to date (up to mid April 2026) in the bores where transducer monitoring has occurred. The transducer records start from 3 June 2025 and therefore the manual measurements for each of these bores are shown in this figure prior to this date. The transducer data indicate typically similar patterns of groundwater level variations in these bores, with the exception of limited periods within the records of bores P02 and P22, where larger variations in levels compared with the other bores are observed.

Bore P22 shows a number of distinct periods whereby large increases in groundwater level have occurred, including during August 2025 and between November and December 2025 when levels briefly reached within close proximity (around 0.01 m) of ground level in the bore. We note these periods in

P22 don't seem to correlate with rainfall and therefore we are unsure of the reason for these large spikes in water level in this bore.

With regard to P02, the record in this bore follows a similar pattern but potentially with larger fluctuations than the other bores. However, the most notable difference in this bore is between late October and late January 2026 when large variations can be observed. During this time there are periods where the groundwater levels fell quickly and significantly below prior measurements in the bore and where recovery of water levels could also be rapid. These patterns are similar to what could be expected from drawdown interference and given the late spring and early summer timeframe over which these changes occur, we expect this could be a relevant reason. We note P02 is located relatively close to onsite irrigation bore M35/0326, and therefore abstraction from this bore could possibly have influenced the water level record in P02.

All bores show a general falling water level trend from around August 2025, however there is also a significant step up in all records in mid January 2026, coinciding with significant rainfall. The trend since that time has been relatively stable in all bores with the exception of fluctuations that are mostly correlated with rainfall. A relatively wet summer has resulted in levels during late summer that are higher than those in spring and early summer. It is possible that this pattern correlates with the cessation of large fluctuations in P02 in January 2026 as the elevated groundwater conditions during the 2026 summer may have resulted in less irrigation demand (including onsite).

Figures 6a and 6b show that there is now over 1 year of groundwater level monitoring that has been collected at this site.

3.2.2 Groundwater Use

As of mid-February 2026, ECans online wells database (Canterbury Maps⁶) identifies 606 bores located within a 2 km radius of the site. However, of these, 456 bores are recorded as 'Active (exist, present)', with the recorded status of the remaining 150 non-active bores varying between Buried/unlikely still exists, Capped (semi-permanent), Casing Retrieved/Abandoned, Collapsed, Filled In, Landparcel Proposed, No Info Expired Bore Consent, Not Drilled, Not Used, Proposed and Sealed/grouted Up.

Of the active bores, the recorded primary use includes Commercial/Industrial (1 bore) Dairy Use (6 bores), Domestic Supply or Domestic and Stockwater (271 bores), Geotechnical/Geological Investigation (1 bore), Irrigation (104 bores), Other (1 bore), Public Water Supply (1 bore), Small Community Supply (1 bore), Stock Supply (13 bores) and Water Level Observation (56 bores). In addition, there is one remaining bore with no specified use. We note, of the 56 active

⁶ Canterbury Maps. <https://mapviewer.canterburymaps.govt.nz/>

water level observation bores identified above, 53 are recorded as being located onsite.

Water is currently used onsite for irrigation purposes via resource consents CRC991022 and CRC991827. CRC991022 allows for the taking and use of groundwater via bores M35/3064 and M35/3065, while CRC991022 allows for abstraction via bores M35/3026 and M35/0367. Use data from these bores is presented in Appendix D of this report. This data shows that irrigation use to date has been greatest during the 2020 to 2021 irrigation season, where the combined annual water use from both consents was 503,318 cubic meters. We note the records in Appendix D indicate that low (2022 to 2023 season) to no usage via CRC991827 since 2022, however we understand there is an issue with the measuring and/or recording device for this consent and water has actually been abstracted from these each year since 2022.

3.2.3 Bore Yields

Of all the 514 bores (active and non-active) within 2 km of the site, 488 have reported depths, which range between 2.4 to 150 m deep. However, 456 of these bores are less than 30 m deep, leaving only 32 that are greater than 30 m in depth. Of the bores with depth information, 172 have reported yield information. Based on this data, Figure 7, Appendix A shows a plot of depth versus yield for bores within 2 km of the site (individual bores shown as blue circles). This information can often be useful to identify depth zones where high yields have been obtained in an area.

However, in this case there is no clear pattern indicating that strata at specific depths may be higher yielding. In addition, the fact there are only limited deep bores in the area makes it difficult to compare yields at different depths. Figure 7 also shows two additional bores marked in orange and a further bore marked in green. The bores marked in orange represent deep bores at distances greater than 2 km from the site where high yields have been obtained. The ECan bore references for each of these bores (M35/12017 and M35/10768) are shown on the figure. The bore marked in green is WDC deep Ōhoka supply bore BW24/0262 which is also labelled.

As noted in Section 1, bore BW24/0262 has a screened intake zone from 78.0 to 84.0 m bgl (total bore depth is 84.7 m bgl). A step-drawdown test was carried out in the bore in 2015, which included pumping the bore at up to 20 L/s for 1.7 hours during the final pumping step. The Assessment of Environmental Effects (AEE) prepared during the consent application to take groundwater from BW24/0262 for community supply purposes was prepared by PDP (PDP, 2016⁷).

⁷ Pattle Delamore Partners. (2016). Application for Resource Consent to Abstract Groundwater from Bore BW24/0262 (Ōhoka Public Supply Bore): Assessment of Environmental Effects. Report prepared for Waimakariri District Council, dated January 2016.

Analysis of the pumping test data by PDP indicated the bore has a potential long-term sustainable yield of 13 L/s.

Bores M35/12017 and M35/10768 are 122 m and 109.1 m deep respectively. Both bores are situated to the south of the proposed development, where M35/12017 is located approximately 4.5 km distant, while M35/10768 is located around 4 km from the site. The screen interval in M35/12017 is from 118 m to 120 m bgl and ECans well search information indicates the bore has a maximum tested yield of 49 L/s, with corresponding drawdown of 19 m. Bore M35/10768 is screened from 103.1 to 109.1 m bgl and has been tested at a flow rate of up to 64 L/s, with a measured drawdown at that rate of 13 m. Both of these bores have very high yields and may indicate it could be worth exploring deeper strata (greater than 100 m depth) for the new supply (although noting these bores are also significantly distant from the site).

New community supply bores at the site are intended to be deep (likely screened at depths greater than 60 m bgl). Deep bores are proposed to ensure the best possible water quality for the supply and also allow for a large amount of available drawdown to achieve desired yields and minimise drawdown interference effects in neighbouring bores (deeper bores will have more available drawdown and therefore be less sensitive to drawdown interference effects).

Based on the yield data shown in Figure 7 and discussed above, there is limited information to confirm the likely yield from future supply bores and therefore we can't be certain of the individual bore yields that will be achieved prior to drilling and testing. However, the performance of BW24/0262 gives a general indication of the yields that may be achieved and deep bores further from the site provide more optimistic information that deeper strata (greater than 100 m deep) could potentially provide higher yields. At this stage it is assumed that multiple bores will be required to achieve the required demand for the development.

3.2.4 Aquifer Parameters

ECans database provides constant rate pumping test results for three shallow bores (all screened above 24 m bgl) between 900 m and 2,100 m from the site. The reported transmissivity values are 1,343 m²/day (M35/0313), 1,580 m²/day (M35/4700) and 3,000 m²/day (M35/9126).

An estimate for the shallow aquifer transmissivity is required for the drawdown interference assessments summarised in Section 6.2.3 of this report. We have adopted a value of 975 m²/day for those assessments, which has been estimated using an empirical relationship between the specific capacity of a bore and transmissivity derived from pumping tests in Canterbury (Bal, 1996)⁸. Specific

⁸ Bal, A. A.; (1996) Valley fills and coastal cliffs buried beneath an alluvial plain: evidence from variation of permeabilities in gravel aquifers, Canterbury Plains, New Zealand. Journal of Hydrology (NZ) Vol 35, No. 1 (1996), p.p. 1-27.

capacity is a measure of yield per unit of drawdown and the derived value for shallow transmissivity is based on the average specific capacity for shallow bores within 2 km of the site. Higher values of transmissivity will typically predict less drawdown interference (although this can be distant dependant) and therefore we consider the adopted value (lower than the values from actual pump testing) of $975 \text{ m}^2/\text{day}$ is conservative for carrying out drawdown interference assessments.

With regard to aquifer parameters for deeper strata, a constant rate pumping test was previously conducted in existing Ōhoka deep supply bore BW24/0262 in December 2015 (PDP, 2016⁷).

The three-day duration pumping test was carried out at a rate of 20 L/s and included monitoring of groundwater levels in existing deep observation bores M35/8381 (88 m deep and located around 730 m east of BW24/0262) and M35/7701 (86 m deep, situated approximately 900 m south-east from BW24/0262). A significant drawdown response was observed in M35/8381, with a lesser but still evident response in M35/7701.

The data from the testing was analysed by PDP and the following aquifer parameters presented in Table 1 were estimated.

Table 1: Aquifer Parameters from Analysis of BW24/0262 Constant Rate Pumping Test

Observation Bore	Transmissivity (T) (m^2/day)	Storativity (S) (dimensionless)	Aquitard Conductance (K'/B') (days^{-1})
M35/8381	110	3.5×10^{-4}	2.8×10^{-4}
M35/7701	120	9.0×10^{-4}	5×10^{-4}
Average	115	6.3×10^{-4}	2.64×10^{-4}

The aquifer parameter estimates for each observation bore are relatively consistent and overall, the quality of the testing and resulting aquifer parameter predictions are considered to be high. Therefore, and taking into account that the new supply bores are not likely to be shallower than BW24/0262, it is considered appropriate that the average values presented in Table 1 are suitable for estimating the potential effects of abstraction from the proposed new bores.

If it turned out that the proposed bores are significantly deeper than BW24/0262, the potential effects of the proposal can be expected to be less than predicted using the aquifer parameters above, as there will likely be additional hydraulic separation from existing bores in the area and from surface water features.

3.2.5 Groundwater Quality

Following drilling of bore BW24/0262 in June 2015, the bore driller (Clemence Drilling) collected a groundwater quality sample from the bore (collected on 26 June 2015). The sample was sent to Eurofins ELS Limited and analysed for a wide range of chemical and physical parameters, in addition to *E. coli*. The results are provided in Appendix E of this report and show that the concentrations of chemical parameters and *E. coli* were measured at levels below relevant Water Services Regulations 2022⁹ health based Maximum Acceptable Value (MAV) limits for drinking-water and Taumata Arowai 2022¹⁰ Aesthetic Value (AV) concentrations.

We note that turbidity at the time of sampling was measured at 3.71 NTU which exceeds the Taumata Arowai 2022¹⁰ AV of 2.5 NTU. However, Appendix 10 of the WDC AMP provides Level of Service (LoS) assessment for the Ōhoka scheme between 2021 and 2024. The assessment provided by WDC indicates there are no compliance issues associated with elevated turbidity and therefore we assume that either the turbidity from the bore has settled at a level below 2.5 NTU, and/or treatment is provided to lower turbidity below the AV.

The WDC AMP indicates that aesthetic parameters for various years including between 2021 to 2024 have been within the Taumata Arowai 2022¹⁰ AV range, with the exception of pH on some occasions. We note that pH is frequently naturally low in groundwater supplies within Canterbury and expect this is likely the reason for not meeting the AV pH range (range of 7 to 8.5) at times. This document also indicates the supply has met chemical drinking-water compliance criteria for all assessment years. In addition, while there appears to be no indication of *E. coli* detections in the supply, it is indicated that chlorine treatment may not currently be adequate to meet the Water Services Regulations 2022⁹ requirements.

The available water quality information indicates that the source of water from BW24/0262 is generally suitable for a public drinking-water supply. Assuming the proposed subdivision supply bores will draw water from a similar depth (or deeper), it is reasonable to assume that will also be the case for the proposed bores.

4.0 Existing Ōhoka Community Water Supply

The WDC AMP indicates Ōhoka is serviced by a reticulated water supply that has approximately 124 connections. The supply is owned and operated by WDC and is principally sourced from BW24/0262 (WDC Ōhoka Well No. 2). As discussed previously, this bore has a screened intake zone from 78.0 to 84.0 m bgl and the

⁹ Water Services (Drinking Water Standards for New Zealand) Regulations 2022.

¹⁰ Taumata Arowai – Aesthetic Values for Drinking Water Notice 2022.

bore has an estimated long-term sustainable yield of 13 L/s. Backup supply bore M35/5609, is also owned by WDC and has a screened intake zone from 16.8 to 18.8 m bgl. However, we understand this bore is only online as an emergency backup bore due to its shallow depth and vulnerability to *E. coli* contamination. Treatment of the supply is provided via chlorine disinfection, although information discussed in the previous section indicates that perhaps some upgrades to the chlorine treatment system may be required. Furthermore, the WDC AMP indicates the scheme is scheduled for additional UV disinfection in 2024/25 and a recent posting on the Government Electronic Tender Service (GETS¹¹) indicates this upgrade was recently out for tender.

The abstraction of groundwater by WDC for Ōhoka township is authorised via resource consents CRC990932 and CRC166054.

Consent CRC990932 allows for the taking of groundwater from shallow backup bore M35/5609 at up to 18 L/s, with an annual volume not exceeding 248,030 m³. Conditions on this consent require flow restrictions at times of reduced flow in the Ōhoka Stream.

Consent CRC166054 allows for abstraction via deep supply bore BW24/0262 (the primary township supply bore), with the same rate and volume restrictions that relate to CRC990932 and backup bore M35/5609 (18 L/s maximum instantaneous rate and an annual volume limit of 248,030 m³). There are no flow restriction conditions placed on CRC166054, which is expected to be the result of the deeper screen zone in BW24/0262 and a lower hydraulic connection with surface water.

New community water supply bores need to be established to service the proposed subdivision area and would likely be installed at a similar or greater depth than the existing community water supply bore BW24/0262 to minimise the risk of *E. coli* and other surface derived contaminants being contained in the source water. Given the low number of deep bores in the area, the sustainable yield from existing supply bore BW24/0262 is likely the best indication of the potential yield and performance of any new community supply bores.

5.0 Proposed Groundwater Takes

5.1 Proposed Community Water Supply

5.1.1 Demand

The proposed peak and average water supply requirements for the subdivisions residential properties are summarised in Tables 2 and 3 below respectively.

¹¹ <https://www.gets.govt.nz/ExternalIndex.htm>

Table 2: Peak Water Supply Demand Summary – Residences			
Lots/Units	No. of Lots/Units	Peak Daily Demand per Connection/Unit (L/con/day)	Peak Demand (m ³ /day)
Small Lots (Res 2 Zone)	752	2,500	1,880
Large Lots (Res 4a Zone)	123	3,810	469
Retirement Village Units (Res 8 Zone)	250	500	125
Total Peak Demand (m ³ /day)			2,474

Table 3: Average Water Supply Demand Summary – Residences			
Lots/Units	No. of Lots/Units	Average Demand per Connection/Unit (L/con/day)	Average Demand (m ³ /day)
Small Lots	752	1,000	752
Large Lots	123	1,165	143
Retirement Village Units	250	250	63
Total Average Demand (m ³ /day)			958
Total Average Demand (+ 15% allowance) (m ³ /day)			1,102

The peak daily demand per connection for large lots (3,810 L/con/day) has been taken from Table 3 of the WDC AMP 2024 (for the Ōhoka supply). The WDC AMP reports this value as the measured five-year average peak daily flow per connection. This value is considered to be relevant to the proposed large lots for the new subdivision, as the existing township consists of mostly large lots.

Peak demand for the proposed small lots is assumed to be 2,500 L/con/day, which is significantly lower than the existing Ōhoka peak, but based on Table 3 of the WDC AMP, is slightly higher than peak values from larger towns like Rangiora, Kaiapoi, Woodend and Pegasus (between 1,931 and 2,009 L/con/day). A significantly lower peak value of 500 L/con/day is assumed for the retirement

village units, assuming smaller living spaces, lower occupation rates and a less water intensive lifestyle.

The WDC AMP reports the measured average daily demand per connection for Ōhoka is 1,165 L/con/day, which has been adopted for the proposed subdivision large lots. A slightly lower average daily demand per connection of 1,000 L/con/day is assumed for the small lots, noting that this is slightly higher than measured values for Rangiora, Kaiapoi, Woodend and Pegasus (800 to 898 L/con/day), consistent with the larger peak flows also sought. The assumed average use for retirement village units is 250 L/con/day.

Based on Table 2, total peak residential water use is 2,474 m³/day. With regard to average daily flow, the estimated use for the subdivision based on Table 3 is 958 m³/day. However, a 15 % allowance is proposed to allow for deviation from the average and also for leakage in pipes. Therefore, the average residential usage is assumed to be 1,102 m³/day. Based on this value, the **proposed annual volume for residential use is 403,332 m³** which provides for sufficient water in a leap year (366 days).

The WDC Engineering Code of Practice (WDC, 2009¹²) stipulates that water supply design assume a maximum of 20 hours of pumping per day. As a result, based on the proposed peak daily volume limit of 2,474 m³, a peak pumping rate of

34.4 L/s is required to deliver the daily volume limit within a 20 hour period.

The subdivision will include a commercial area in the north-east region of the site over an area of approximately 2 ha. The WDC Code of Practice indicates a peak hourly flow of 1 L/s/ha should be used for business and commercial design purposes. On that basis, assuming up to 12 hours of water use per day at 2 L/s (2 ha area) a peak daily volume of 86 m³ is sought for the commercial area. To calculate an annual volume for commercial use it is assumed that 50 % of the peak rate may be used over 12 hours each day (43 m³/day) and 6 days a week. The **proposed annual volume for commercial use is 13,416 m³**.

In addition to the demand requirements outlined above, additional water will be required for irrigation, as part of the amenity irrigation from the community water supply. This includes irrigation of a polo field, and irrigation of SMA areas. Table 4 shows the demand for irrigation of the polo field calculated using the Irrigation New Zealand online Reasonable Use Calculator¹³. A copy of the output file from the irrigation water demand assessment is provided in Appendix F.

¹² Waimakariri District Council. (2009). Engineering Code of Practice.

¹³ Irrigation New Zealand.

<https://www.irrigationnz.co.nz/PracticalResources/IrrigationDevelopment/AllocationCalculator>

Table 4: Water Supply Demand Summary – Polo Field Irrigation

Irrigation Area (ha)	Adopted Profile Available Water (PAW)	Daily Volume (m³/day)	Annual Volume (m³)
4.8	120	254	36,288

The polo field will cover an area of approximately 4.8 ha and the irrigation demand has been calculated based on selecting pasture as the irrigation crop. S-MapOnline¹⁴ indicates the Profile Available Water (PAW) over the majority of the site is 128 mm and therefore a user specified PAW of 120 mm was selected for the assessment. The calculator accesses climate data in proximity to the site to calculate daily and annual irrigation volumes. The calculated daily irrigation volume is 254 m³, while the **proposed annual volume for polo field irrigation is 36,288 m³**. The annual volume allows for the application of 5.3 mm per day of water over the 4.8 ha irrigation area for approximately 143 days. The continuous flow rate to achieve the daily volume of 254 m³ is 2.94 L/s.

SMA irrigation may be required for limited periods during the year. The proposed basins and wetlands will intercept groundwater during much of the year, however they may also dry out for periods at times of low groundwater levels. During these times, the vegetation within the basins may need irrigation. To address this, we have allowed for up to 60 days of irrigation per year over the SMA areas. Table 5 below sets out the irrigation demand allowed for SMA basin irrigation.

Table 5: Water Supply Demand Summary – SMA Irrigation

Irrigation Area (ha)	Daily application depth (mm)	No. of days per year	Daily Volume (m³/day)	Annual Volume (m³)
7.2	5	60	360	21,600

We understand the total area of SMA basins and wetlands is 7.2 ha. Assuming irrigation requirements of 5 mm/day a daily volume limit of 360 m³ is required. Allowing for a maximum of 60 days irrigation per year the **proposed annual volume for SMA irrigation is 21,600 m³**.

Based on the demand requirements set out above, Table 6 summarises the total water demand sought for the proposed subdivision. The peak flow rate, peak daily volume and annual volume values provided would be adopted as limits on the proposed resource consent.

¹⁴ S-MapOnline. Landcare Research. <https://smap.landcareresearch.co.nz/>

Table 6: Total Water Supply Demand Requirements			
Water Use	Peak Flow Rate (L/s)	Peak Daily Volume (m ³)	Annual Volume (m ³)
Residential	34.4	2,474	403,332
Commercial	2	86	13,416
Irrigation (Polo Field)	2.94	254	36,288
Irrigation (SMA areas)	4.17	360	21,600
Total Use	43.51	3,174	474,636

5.1.2 Estimate of Number of Bores Required to Meet Demand

WDC has indicated that for a proposed water supply of the scale proposed, “N + 1” redundancy would be appropriate. This means that the water supply must be able to meet peak network demand with one bore offline.

Previous correspondence with WDC has also indicated that any excess capacity available in existing water supply bore BW24/0262 can be included for assessment of N + 1 redundancy and to determine the required total number of bores, taking into account any projected increase in demand from the existing water supply bore. The existing shallow emergency backup supply bore (M35/5609) has not been included in the existing redundancy assessment (although potential water quality issues in the bore could likely be addressed through a greater level of treatment, if required).

Based on the WDC AMP, the average daily flow (5-year average) for the Ōhoka supply is 139 m³ with a peak daily flow of 448 m³, which equates to flow rates of 1.9 L/s and 6.2 L/s respectively, assuming 20 hours per day of pumping.

Connections are projected to increase from 124 currently, to 307 by 2073. In addition, the projected average daily flow is expected to increase from 1.6 L/s currently (1.9 L/s over 20 hours) to 4.9 L/s (5.9 L/s over 20 hours) by 2073. Peak flows are predicted to increase from 5.2 L/s currently (6.24 L/s over 20 hours) to 12.3 L/s (14.76 L/s over 20 hours) by 2073. The peak flow rate projections for 2073 result in a peak daily volume requirement of 1,062.7 m³.

The resource consent volume limit for the existing WDC Ōhoka supply is 1,555 m³/day. This equates to abstracting at the maximum instantaneous rate limit of 18 L/s for 24 hours. If this same volume was supplied over 20 hours, a rate of 21.6 L/s would be required, although the consent does not allow this.

Furthermore, it is not possible to abstract these quantities from BW24/0262, as the duty set point for the supply is 12.8 L/s, which equates to 921.6 m³/day after 20 hours of continuous pumping. We note the duty set point is consistent with

the 13 L/s long-term sustainable yield estimated from aquifer testing on the supply bore (PDP, 2016⁷).

Based on the WDC projected growth (volume requirement of 1,062.7 m³/day by 2073) and duty set point in BW24/0262 (volume limit of 921.6 m³/day), by 2073 there is a predicted shortfall in the peak capacity of the current township supply of 141.1 m³/day at that time. However, that demand is a long way in the future and the existing use information indicates there is currently capacity from BW24/0262 (total bore capacity of 12.8 L/s) as follows:

- ✧ 10.9 L/s capacity under average use conditions - Based on existing average use of 1.9 L/s over 20 hours.
- ✧ 6.6 L/s capacity under peak use conditions - Based on existing peak use of 6.2 L/s over 20 hours.

It is considered the existing capacity from bore BW24/0262 would be sufficient to service Stage 1 and the proposed commercial facility as shown in Table 7 below.

Table 7: Stage 1 and Commercial Water Supply Demand Requirements			
Water Use	Average Flow Rate (L/s)	Peak Flow Rate (L/s)	Annual Volume (m³)
Stage 1 Residential (100 lots)	1.39	3.5	42,090
Commercial	0.86	2	13,416
Total Use	2.25	5.5	55,506

The existing township demand figures presented above plus the demand for Stage 1 and the commercial development are as follows:

- ✧ Average flow requirements – Existing demand of 1.9 L/s + Stage 1 and commercial development demand of 2.25 L/s = 4.15 L/s.
- ✧ Peak flow requirements – Existing demand of 6.2 L/s + Stage 1 and commercial development demand of 5.5 L/s = 11.7 L/s.

These figures are within the duty set point of bore BW24/0262 and therefore based on the numbers above, there is capacity within the existing supply for Stage 1 and the commercial development. The applicant will need to discuss servicing the early development requirements with WDC and confirm agreement.

As per Table 6, the peak daily volume requirement for the subdivision is 3,174 m³/day and a peak pumping rate of 43.51 L/s is sought. If it is agreed with WDC that Stage 1 and the commercial development could be serviced by BW24/0262, then this peak rate would reduce to 38.01 L/s. If the maximum duty points of any new supply bores within the proposed subdivision area are

assumed to be 12.8 L/s (i.e. the same as WDC existing deep supply bore BW24/0262), then four new supply bores would be required to achieve (and exceed) the proposed maximum rate (43.51 L/s) and daily volume requirements for the development. Four bores operating at 12.8 L/s would provide a flow rate of 51.2 L/s, which is significantly greater than the 43.51 L/s. However, three bores would only provide 38.4 L/s which is a lower peak rate than required, although three bores may be sufficient if Stage 1 and the commercial development are provided by BW24/0262.

We note the long-term sustainable yield predictions in BW24/0262 made previously by PDP include a level of conservatism. If maximum flow rates of up to 14.5 L/s can be achieved from new bores, then it would be possible to meet the full development requirements (where the existing capacity of BW24/0262 is not utilised for Stage 1 and the commercial development) with three rather than four new supply bores. However, to allow for N+1 redundancy requirements an additional bore will be required on top of the demand requirements for the development (four or up to five bores could potentially be required in total). It should be noted, the total number of bores required can't be confirmed with certainty prior to drilling and testing of each new individual bore and therefore the information set out above is indicative only.

Based on the above information, it is estimated that up to five new water supply bores may potentially service the new subdivision and provide N + 1 redundancy. However, it is important to note there is some uncertainty regarding the yield that will be obtained from individual new bores. Higher or lower yields than the existing supply bore BW24/0262 are possible and therefore the final number of bores required cannot be confirmed with certainty at this stage.

5.2 Proposed Subsoil Drainage System

A subsoil drainage system will be constructed beneath the road kerb lines and/or roadside swales. This will protect the pavements onsite from damage at times when groundwater levels are elevated.

A plan showing the extent of subsoil drains is provided as Figure 8, Appendix A. This figure shows both the extent of the proposed subsoil drain network and the relative elevation of the drains to the onsite soil interface between shallow fine-grained silt and clayey silt strata and the underlying more permeable sandy gravel deposits. For example, where the drains are marked red in Figure 8 the proposed drains will be between 0.6 and 0.2 m below the clayey silt and gravel interface. For drains marked magenta (the largest areas in the figure), the drains will be between 0.2 m below and 0.2 m above the interface. The relative elevations are shown in the key and it can be seen that drains marked in brown, green and blue are all areas where the drains will be above the gravels.

The total combined length of proposed subsoil drains at the site is 28.17 km and the length of the drains marked red or magenta (potentially installed within the gravel strata) in this figure is 13.4 km (47 % of the total drain length).

The drainage system will discharge to SMA basins onsite and there will only be flow in the drains (to the basins) when groundwater or soil drainage water is at an elevation above the base of the drains and simultaneously when the elevation of ponding in the SMA's is lower than the elevation of water in and above the drains. During dry periods there will be no soil drainage water and groundwater will fall below the elevation of the drains. In addition, we don't expect there will be prolonged periods when groundwater levels are high (above the drain elevation) that will result in significant long-term flow to the basins. This is because the water levels in the basins will also be high at these times and therefore there won't be a significantly high hydraulic gradient towards the basins during prolonged high groundwater level conditions. Therefore, the main function of the drains will be to drain shallow soils within areas beneath and adjacent to the roads following rainfall events.

To estimate the amount of water that could periodically flow out of the subsoil drains we have used ECan's online 'Narrow Trench Model (Unconfined)'¹⁵ dewatering tool. The input parameters for the assessment are as follows:

- ✧ 13,400 m length of drains within gravel strata.
- ✧ Drains laid in 0.8 m wide trenches.
- ✧ Drawdown of 0.3 at the location of drains.
- ✧ Assumed hydraulic conductivity of 30 m/day.
- ✧ Typical unconfined specific yield of 0.1.

The drain length is considered conservative as we expect there will be a significant length of drains that will not be installed within the permeable gravel strata underlying the site. This assumption is based on Figure 8, where the drains shown in magenta in this figure are not all at elevations within the gravels (some are expected to be up to 0.2 m above the gravels in lower permeability strata).

The assumed hydraulic conductivity adopted for the assessment is representative of highly permeable gravel-based strata. The assumed drawdown is expected to be relatively low given the high adopted hydraulic conductivity, the narrow nature of the drains and the expected shallow drain installation depth. As a result, their influence will be local in nature and will not result in widespread drawdown.

¹⁵ <https://www.ecan.govt.nz/do-it-online/resource-consents/applying-for-resource-consent/preparing-your-application/tools-and-resources#e29004>

To estimate drain inflows, we have used a long 30-day simulation period so that we predict close to steady-state flow conditions to the drains that are reflective of the assumed permeability of the soils and the adopted drawdown.

The predicted drain flows using the methodology above are 5.4 L/s.

In addition, we note there will also be an additional 14.8 km of drains at the site that will be installed above the gravel strata into less permeable deposits.

Therefore, we have carried out an additional assessment using the same methodology as above, but with the following changes.

- ✧ Drain length is 14,800 m.
- ✧ Assumed hydraulic conductivity of 5 m/day.

The predicted drain flows for this scenario are 2.4 L/s. The combined drain flows for both simulations are therefore 7.8 L/s.

Output files for both assessments are provided in Appendix G.

It should be noted that these predictions are approximate upper limits, although there is some uncertainty regarding the actual flow rates that will occur from the drainage system. As a result, for consenting purposes we consider a flow limit of 10 L/s from the drains is appropriate to account for this uncertainty. However, it is important to note that the water removed from the drains will be discharged back onsite to the SMA's and is therefore non-consumptive in nature. The SMA outlets are set equivalent to the highest predicted groundwater elevation at each location and therefore there is no loss of groundwater from the SMA's to surface water and only stormwater flows are discharged offsite.

6.0 Assessment of Environmental Effects – Community Water Supply

6.1 Scope of Potential Effects

The relevant Canterbury Land and Water Regional Plan (LWRP¹⁶) regional rule for the proposed consent application is Rule 5.115. This rule allows for the taking and using of water for a community water supply from groundwater or surface water as a restricted discretionary activity, provided the following conditions are complied with:

1. A Water Supply Strategy prepared in accordance with Schedule 25 is submitted with the resource consent application; and

¹⁶ Environment Canterbury. <https://www.ecan.govt.nz/your-region/plans-strategies-and-bylaws/canterbury-land-and-water-regional-plan/>

2. Where the application seeks water for purposes other than drinking-water, the application should identify which components are not related to drinking-water, and which of those are existing or new activities.

ECan's discretion is limited to the following matters:

1. The reasonable demand for water, taking into account the size of the community, the number of properties and stock that are to be supplied, the uses that are to be supplied and the potential growth in demand for water; and
2. The effectiveness and efficiency of the distribution network; and
3. The quality and adequacy of, compliance with and auditing of the Water Supply Strategy; and
4. The actual and potential adverse effects on other water takes, including reliability of supply; and
- 4A. The effect on the environmental flow and allocation limits within the relevant sub-region Sections 6 to 15; and
5. The potential benefits of the activity to the applicant, the community and the environment; and
6. Compliance with any relevant Water Conservation Order; and
7. The need for and extent of the proposed Community Drinking-water Protection Zone; and
8. The matters set out in Schedule 1 and the way in which those matters are responded to in the proposal for which consent is sought and the assessment of effects forming part of the application; and
9. The actual and potential effects on any user of land located within the proposed Community Drinking-water Protection Zone; and
10. Any adverse effects on Ngāi Tahu values or on sites of significance to Ngāi Tahu, including wāhi tapu and wāhi taonga; and
11. The potential adverse effects on any Critical Habitat.

With regard to the conditions of Rule 5.115, the proposed Water Supply Strategy (requirement of Condition 1) prepared in accordance with Schedule 25 is provided in Appendix H. In addition, Tables 4 and 5 identify the component of water required that will not be used for drinking-water purposes as per Condition 2 of Rule 5.115. This water will be used for amenity irrigation of a community polo field and irrigation of SMA's. The volume required for this irrigation is 57,888 m³ per year, which represents only approximately 12 % of the total 475,002 m³ annual volume requirement. This irrigation component is for an existing activity (irrigation already occurs at the site but the proposed irrigation

will be for a different purpose) and represents a very small proportion of the existing pasture irrigation volumes consented under CRC991022 and CRC991827. Allocation from these existing consents will be surrendered once the site is developed and therefore there will be a large decrease in the amount of water allocated for irrigation purposes. In fact, the total amount of groundwater allocated at the site will reduce significantly as a result of this proposal (see Section 6.2.4.1).

With respect to the matters of discretion, it is noted that Section 5.1.1 of this report has discussed the demand for water (matter of discretion 1). For residential and commercial use, the demand has been calculated based on existing Ōhoka township use (as reported in the WDC AMP), consideration of use from other WDC townships and from recommended design values from the WDC Code of Practise. Irrigation demand for the polo field has been calculated using the Irrigation New Zealand online Reasonable Use Calculator and limited irrigation of SMA's is based on a typical daily application rate of 5 mm/day. As a result, it is considered the requested rates and volumes of water are reasonable.

With regard to matter of discretion 6, there are no relevant Water Conservation Orders in proximity to the site and therefore no further assessment is provided in this regard.

Matter of discretion 10 is covered by Inovo in their planning report and matter of discretion 11 is not relevant as there is no Critical Habitat onsite.

For groundwater takes it is also often relevant to consider potential effects of saltwater intrusion or land subsidence that may be induced by abstractive groundwater pumping. With regard to saltwater intrusion, no adverse effects are anticipated because the site is situated around 11 km from the coast and therefore saltwater intrusion is not a concern. With respect to subsidence, the strata from which the bores will abstract groundwater are deep and consist of dominantly clast supported gravels which are not prone to consolidation.

Effects assessments relevant to the proposal and that include all the remaining matters of discretion outlined above are provided in the following sections of this report.

6.2 Matters of Discretion Effects Assessments

6.2.1 Effectiveness and efficiency of distribution network (Matter of Discretion 2)

The distribution network will be a new system and pressure tested prior to use. Therefore, the distribution network will be effective and efficient.

6.2.2 Water Supply Strategy (Matter of Discretion 3)

Inovo has prepared a Water Supply Strategy (WSS) in line with Schedule 25 of the LWRP and as required by Condition 1 of Rule 5.115. We have reviewed this document and consider it is in line with the requirements of Schedule 25. The WSS is provided in Appendix H of this report.

6.2.3 Actual and potential adverse effects on other water takes, including reliability of supply (Matter of Discretion 4)

We note the capacity within the existing WDC system allows for additional drawdown interference and stream depletion effects than are currently occurring (due to demand currently below the consented capacity of CRC166054). Our assessment of potential effects on neighbouring bores assessed below uses the full subdivision demand values set out in Table 6 of this report and therefore does not account for the additional capacity within the existing WDC supply. Therefore, the assessment is overly conservative with regard to pumping rates and effects, as some of the demand is proposed to come from the existing WDC supply, where those effects are already consented.

When groundwater is abstracted from a bore, the water level lowers in the bore casing. This is known as drawdown, which also occurs outside the bore in the surrounding saturated strata. The magnitude of drawdown will decrease with distance from the pumping bore, but when the drawdown extends to a neighbouring bore it is termed 'drawdown interference'. If significant, drawdown interference has the potential to adversely affect neighbouring bore users by reducing the available drawdown (required for their own yield requirements) in their bore and in the worst case, can result in the inability of neighbouring bores to abstract water. In general, for stratified strata, pumping from shallow bores will cause the greatest drawdown interference in other shallow bores, and pumping from deep bores will cause the greatest drawdown interference effects in other deep bores.

Most bores surrounding the site are shallow (i.e. less than 30 m deep), including the existing irrigation bores situated on the site. These existing irrigation bores allow for abstraction of groundwater at up to 60 L/s under consent CRC991022 and 45.6 L/s under consent CRC991827. These bores will be decommissioned once subdivision development is completed and therefore there will be a significant reduction in drawdown interference in the majority of neighbouring shallow bores when the irrigation bores are no longer used.

In contrast, the proposed future abstraction from deep supply bores will increase the existing drawdown interference in other deep bores. However, as mentioned previously, there are very few existing deep bores in the area and deep bores have significantly greater available drawdown than shallow bores and are therefore typically less sensitive to drawdown interference effects.

Based on the above, it is expected that drawdown interference effects will likely reduce as a result of the proposed development compared to the current level of effects. However, to confirm this and provide a conservative estimate of the potential scale of effects that will occur in deeper bores, we have used the LWRP Schedule 12 methodology which is the accepted criteria used to assess effects on existing groundwater users.

Schedule 12 requires that interference effects are assessed in all bores within a 2 km radius of a new abstraction bore. Where a new bore causes more than 0.1 m of drawdown interference in any neighbouring bore, a cumulative assessment is required in those bores that also takes into account the combined drawdown interference effect from all other consented groundwater users in the area.

Schedule 12 requires both short-term (7 day) and long-term (150 day) pumping simulations and for this assessment we have assumed the following rates:

- ✧ Short-term (7 day) pumping rate – 36.77 L/s
- ✧ Long-term (150 day) pumping rate – 25.39 L/s

While the proposed maximum pumping rate for community supply purposes is 43.51 L/s, we note the proposed maximum daily volume of 3,174 m³ limits the continuous 7 day abstraction rate to a maximum 36.747 L/s. We note there has been a recent reduction (by 1 Lot) in the size of the development which means the assessed short-term rate set out in the bullet point above is very slightly higher than the 34.74 L/s calculated from the daily volume limit.

The 150 day rate has been adopted based on assuming a volume of 329,012 m³ is abstracted over this period. This conservatively represents nearly 70 % of the proposed community supply annual volumes for residential and commercial use and all of the irrigation annual volumes (polo field and SMA irrigation) as shown in Table 6. In reality, if these proportions of the annual residential and commercial volumes were abstracted over 150 days, it is possible that the total proposed annual volume limits would be exceeded at the end of the water year. Therefore, we consider the assessment is conservative because it overpredicts the amount of water that will be taken over the 150 day assessment period required by Schedule 12.

As described previously the assessment carried out is based on the total subdivision demand. It is proposed that Stage 1 and the commercial development are supplied from existing capacity within the existing township supply (via bore BW24/0262 and consent CRC166054). However, the rates set out above and adopted for this assessment are for the full subdivision demand and therefore provide for the most conservative scenario where the existing township capacity is not utilised.

When assessing effects in neighbouring bores, the Schedule 12 methodology requires that the drawdown assessment uses the calculated values that are greatest from either the 7 day or 150 day simulations.

As discussed previously, there are a large number of shallow bores in the vicinity of the proposed subdivision. Schedule 12 states that:

“where an existing bore inadequately penetrates an aquifer, the interference effect of a new bore will be assessed as if the existing bore is also adequately penetrating”.

The adequate penetration depth can be defined as a:

“... level to which 50% of bores within 2 km penetrating the aquifer are already established at 1 January 2002”.

To determine an adequate penetration depth, we have used the methodology described above but have only considered bores up to 30 m in depth. This cut off depth is conservative and is supported by the online Schedule 12 data check tool which indicates the majority of the bores in the area are 30 m deep or less. The assessment is considered conservative because including deeper bores would skew the results of the adequate penetration depth assessment to a deeper value. Based on the methodology in Schedule 12 given above, the adequate penetration depth for the proposed assessment has been calculated as 14.3 m bgl.

Five individual drawdown interference assessments have been carried out to cover the potential range of impacts that could occur from pumping groundwater via new deep bores at the site. Due to the large area of the site, the five individual assessments have been undertaken at different locations around the boundary of the site, so as to cover the potential maximum range of impacts in surrounding strata resulting from different points of take (new bore locations are not currently confirmed). Each of these five assessments assumes the entire quantity of groundwater required is taken from a single abstraction bore at various property boundary locations. In reality, multiple bores will be required, spread around the site and none will be within 100 m of a boundary (see section 6.2.6). Therefore, the assumption of the take occurring from a single bore at the boundary of the site is considerably conservative.

The locations of the five assessed sites are shown in Figure 9, Appendix A and it can be seen that the chosen sites are well distributed so that the maximum potential effects relating to different bore locations are well covered. Based on the assumption that the entire volume of water can be taken from any of the five simulated locations, then it is reasonable to assume that localised effects will be reduced considerably by spreading the volume of water taken over multiple bores (as will actually occur).

For each of the five assessments, the following additional assumptions are made.

- ✧ The conceptual aquifer conditions underlying the site can be represented by adopting the Hunt and Scott (2007¹⁷) Solution, which assumes a two-aquifer system (shallow unconfined and deep semi-confined aquifers) separated by a lower permeability aquitard. Drawdown interference is calculated using this conceptual model.
- ✧ The proposed new water supply bores are present in a deep pumped aquifer that extends to depth from 30.6 m bgl. All bores deeper than this are conservatively assumed to be screened in the same single deep aquifer.
- ✧ The average transmissivity and storativity values presented in Table 1 are relevant to the deep (semi-confined) aquifer.
- ✧ The average aquitard conductance value from Table 1 represents the scale of vertical leakage that migrates downwards to the deep aquifer due to reduced vertical hydraulic conductivity (compared to horizontal conductivity) within the aquitard. The aquitard is assumed to include the thick clay layer observed in BW24/0262.
- ✧ All bores shallower than 30.6 m bgl are assumed to be present in a single shallow unconfined aquifer where the water table is present.
- ✧ Any bores shallower than 14.3 m bgl are assumed to be 14.3 m deep (adequate penetration depth).
- ✧ A typical specific yield value of 0.1 is assumed at the water table.
- ✧ The transmissivity at the water table is 975 m²/day, as detailed in Section 3.2.4

The adopted depth of 30.6 m between the deep and shallow aquifer is based on review of bore depths for all bores within 2 km of the site. As discussed previously, most bores in the area are shallow and fall in a range of up to 30.5 m deep. Thereafter, the next shallowest bore is 35.2 m deep which represents a significant break in depth compared to the variation between other shallower bores. We also note that the 30.5 m deep bore (M35/9126) is actually screened between 19 and 24 m bgl and that its borelog indicates lower permeability strata at depths below 24 m (consistent with the assumed aquitard and clay layer in BW24/0262). This is despite the bore being located over 2.7 km south-west from BW24/0262. Based on the above, hydraulic separation between deep groundwater and shallow groundwater appears to be a consistent feature in the area and 30.6 m is considered a reasonable value for separation of the assumed

¹⁷ Hunt, B. and Scott, D. (March 2007). *Flow to a Well in a Two-Aquifer System*. Journal of Hydraulic Engineering 12(2).

aquifers in the simulation (and also means that bore M35/9126 will be included in the assessment as a shallow bore rather than deep bore which is supported by the reported screen interval).

The online Schedule 12 assessment tool estimates the available drawdown in all bores within 2 km of a simulated abstraction bore by calculating the distance between a cutoff drawdown level (representing a level 2 m above the screen in a bore) and the ECan Calc Min water level. The Calc Min water level is a level interpolated by ECan in all bores that represents a level exceeded 80 % of the time (i.e. low groundwater level conditions).

Based on the available drawdown calculated by the programme, 80 % of the available drawdown is protected so that an individual bore can achieve its own yield requirements and 20 % is available to accommodate drawdown interference effects. Schedule 12 considers both cumulative drawdown interference (caused by all abstraction bores within 2 km operating at the same time) and direct drawdown interference (the effects from the bore(s) being assessed, i.e. a new groundwater take). As indicated previously, for a new pumping bore(s), consideration of the total cumulative and direct effects only needs to be done if the direct effect in any individual bore exceeds 0.1 m.

The output files from the assessment are provided in Appendix I of this report and a spreadsheet file is also provided with this report for review purposes. The results of the five separate assessments (labelled Bore Location 1 through Bore Location 5) show relatively small amounts of drawdown interference predicted in shallow bores (<0.36 m in all cases) and larger predicted drawdown in bores within the depth zone of the assumed deep aquifer. For deep bores greater than 30.6 m deep or more, there are no instances for all five assessments where the predicted cumulative and direct drawdown interference effects exceed the 20 % (of available drawdown) Schedule 12 threshold.

In contrast, there are a significant number of instances where the Schedule 12 threshold is exceeded in shallow bores less than 30.6 m deep. However, each of the five assessments carried out does not account for the reduction in drawdown interference in neighbouring shallow bores that will occur once the onsite shallow irrigation bores are no longer used. Therefore, a comparison is required to compare the drawdown interference effects caused by the existing irrigation bores, versus the effects from the proposed new deep pumping bores. The difference in effects represents the actual scale of effects relevant to this proposal.

Based on the above, an additional drawdown interference assessment (labelled Existing) was carried out to simulate the effects of pumping from the onsite irrigation bores authorised by resource consents CRC991022 and CRC991827. This assessment assumes a single unconfined aquifer extending from the water table to 30.6 m bgl with a transmissivity of 975 m²/day and an assumed

storativity of 0.1. These parameters are consistent with those used for the shallow strata in the five deep bore assessments described previously.

The Theis (1935¹⁸) solution has been used to calculate drawdowns in the shallow aquifer for the existing irrigation bore simulation. In addition, a 14.3 m adequate penetration depth is assumed as per the previous assessments and the Schedule 12 pumping rates specified by ECan on their database are used for each pumping bore. It is noted that this assessment includes pumping from M35/9423, even though this bore was never drilled. We have still included this bore in the assessment as its use is included in the existing baseline level of consented effects that would have been considered when consent CRC991022 was granted.

In each of the new deep bore location assessments, the last three columns of each output file (highlighted in yellow) provide a comparison with the drawdown interference calculated from operation of the existing irrigation bores. The columns labelled 'Existing DD' show the sum of drawdown caused in each neighbouring bore as a result of pumping from the shallow onsite irrigation bores. The next column labelled 'Change' shows the difference in drawdown between pumping from new water supply bores and pumping from the shallow irrigation bores. The final column labelled 'Result' confirms whether the drawdown interference has increased or decreased as a result of abstracting from the proposed new deep bores and ceasing to use the existing shallow irrigation bores.

Rows of bores highlighted in green in the output files (all five deep bore simulations show this) are bores that are greater than 30.6 m deep and are therefore simulated as being screened in the deep strata that will be directly impacted by abstraction from the proposed water supply bores. For these rows, the assessments do not show any comparison in drawdown interference between abstraction from the existing irrigation bores and abstraction via the proposed deep water supply bores. This is because the shallow existing simulation conservatively did not calculate drawdown in bores deeper than 30.6 m in depth. Despite there being no comparison of effects for deep bores, it can be seen in all five output files that the potential effects in deep bores are all within the Schedule 12 criteria (i.e. the relevant columns in the green highlighted rows showing deep bores state 'ok' rather than 'exceeded').

Rows for the individual shallow bores where the drawdown interference effect has increased are highlighted in orange, although it can be seen that only in two simulations (Bore Locations 1 and 4 situated at the southern site boundaries) does this occur. However, in all these cases, with the exception of one bore (where the row is highlighted red), it is apparent that the calculated drawdown

¹⁸ Theis, C.V. (1935). The Relation between Lowering of Piezometric Surface and the Rate of the Duration of Discharge of a Well Using Groundwater Storage. Eos, Transactions American Geophysical Union, 16, 519-524.

interference effect does not exceed the 20 % of available drawdown threshold (i.e. the output file states 'ok' in the relevant column rather than 'exceeded').

The single bore where the assessment indicates the Schedule 12 criteria is 'exceeded' is M35/0593 (9.1 m deep) and the exceedance only occurs for the Bore Location 1 simulation (red highlighted row). This bore is located approximately 1.7 km from the site at 446 Mandeville Road. The bore owner is reportedly DW and TJ Sanders and the bore use is given as stock supply. We assume the use given for the bore is no longer relevant, as the property is only 0.77 ha in area and the Canterbury Maps aerial image shows no indication of stock onsite. The front half of the property shows garden around the dwelling, while the back half of the site shows lines of trees indicating some form of crop is grown. There is no resource consent to take groundwater associated with this bore and given the area of the property (< 20 ha), abstraction of groundwater would need to comply with permitted activity rule 5.113 of the LWRP. This would limit the abstraction to 5 L/s, although if the bore was used at this rate pumping could only occur for around 30 minutes due to the low daily volume limit of only 10 m³.

Further to the above, we note there is an additional bore located on the property at 446 Mandeville Road. This is bore M35/9876, which is recorded to be 20.48 m deep with a reported use of domestic and stock water supply. Our Schedule 12 assessment shows the effects in this bore meet the appropriate thresholds. This bore was also drilled much later (2003 instead of 1948 for M35/0593) and is deeper. We consider it is reasonable to assume M35/0593 is no longer used and that M35/9876 replaces it. However, we have still carried out the additional assessment below.

The Appendix I, Bore Location 1 simulation assessment shows the following results in M35/0593.

- ✧ Available Drawdown – 5.93 m (based on assuming bore is adequately deep (14.3 m deep))
- ✧ Protected Drawdown – 4.744 m (80 % of available)
- ✧ Allowable Drawdown for Interference – 1.186 m (20 % of available)
- ✧ Cumulative Drawdown – 1.088 m (from all bores pumping within 2 km, except applicant)
- ✧ Direct Drawdown – 0.101 m (applicant's effect)
- ✧ Total Drawdown Interference – 1.189 m (cumulative + direct drawdown)

Based on the above, the Total Drawdown Interference of 1.189 m is greater than the Allowable Drawdown for Interference of 1.186 m. However, the exceedance is only 3 mm and means that 20.05 % of the Available Drawdown is used as a result of drawdown interference compared to the 20 % allowable limit under

Schedule 12. We also note that the increase in drawdown interference is estimated to be only 25 mm compared to the effects of operating the existing irrigation bores.

While the assessment above indicates an exceedance of the Schedule 12 criteria, we don't consider there will be any actual adverse effects on M35/0593 for the following reasons:

- ∴ The assessment assumes all the required allocation of water will be abstracted from a single bore at the southern boundary of the site. The actual take will be spread across the property. Spreading the take across the site will reduce the effect in M35/0593 by more than 3 mm.
- ∴ As assessed, bore M35/0593 still has 4.741 m of available drawdown to achieve its own yield. We note the shallow gravelly strata in the surrounding area is relatively permeable and the average specific capacity of shallow bores within 2 km of the site is 4 L/s/m. This means that for every 1 m of drawdown a yield of around 4 l/s can be expected. This would indicate that the bore would need less than 1 m of drawdown to provide the daily volume of 10 m³ allowed by LWRP rule 5.113.
- ∴ We expect M35/9876 is likely a replacement for M35/0593 and this newer bore appears to be the drinking-water supply bore for the property.

Based on the assessments described above, the predicted effects of abstracting groundwater from the proposed deep bores at the site are within the thresholds required by Schedule 12 of the LWRP. This is not unexpected, because other deep bores are not particularly sensitive to drawdown interference, as they have large amounts of available drawdown to accommodate these effects. In addition, effects in shallow bores in the area can be expected to be less than what occurs currently via abstraction from the onsite shallow irrigation bores. Once the development occurs, pumping from the existing on-site irrigation bores will cease indefinitely and the groundwater abstraction at the site will shift to the proposed deep bores. This can be expected to result in an overall decrease in drawdown interference in sensitive shallow bores.

The assessments carried out do not indicate any existing neighbouring bores will be adversely affected and have the reliability of their supply impacted. Overall, the predicted drawdown interference effects on neighbouring bores as a result of the proposal are considered to be less than minor.

6.2.4 The effect on the environmental flow and allocation limits within the relevant sub-region Sections 6 to 15 (Matter of Discretion 4A)

6.2.4.1 Groundwater

The site is located within the Eyre Groundwater Allocation Zone (GWAZ) as defined by ECan. Table 8e (Section 8.7.2) of the LWRP presents an allocation limit of 99.07 million m³/year for the Eyre GWAZ. We have been provided with a letter dated 13 April 2026 from ECan Principal Consents Planner (Jo Mitten) to Anderson Lloyd (Meg Davidson) which states there is currently 95,055,741 m³/year of groundwater allocated within the Eyre GWAZ. This represents 95.95% of the allocation limit and means there is still 4,014,259 m³/year of groundwater allocation available within the zone.

As stated previously, abstraction via irrigation consents CRC991022 and CRC991827 will cease once the site is fully developed. Therefore, the existing allocation under these consents will be surrendered. Neither of the existing irrigation consents have annual volume limits as conditions of consent, however we note that ECan has calculated an annual volume of 566,032 m³ for CRC991022 in their accounting tally in the Eyre GWAZ and an annual volume of 113,536 m³ for consent CRC991827.

Based on the above, the total allocated volume for CRC991022 and CRC991827 is 679,568 m³. We note that irrigation use data from these consents has been provided in Appendix D of this report. This data indicates that use to date has been highest during the 2020 to 2021 irrigation season, where a total of 503,318 cubic meters was abstracted via both consents. The proposed annual volume limit for the subdivision is 475,002 m³ which is considerably less than the current allocation for irrigation (204,566 m³ less) and is also less than the highest irrigation use to date (28,316 m³ less). Therefore, the proposal will result in a net reduction in allocation and use in the zone. It is also possible that a lower annual volume will be suitable if WDC agree to utilising the existing capacity within the township supply for Stage 1 and the commercial area of the development.

In addition to contributing to a reduction in allocation within the Eyre GWAZ, we also note there is no sign of any long-term decline in groundwater levels within the GWAZ. This is evident based on the shallow (M35/0596) and deep (M35/11918) groundwater level records that have been presented previously in Figure 4. Both of these records show stable groundwater levels and therefore indicate sustainable resource management.

Based on the information provided above, the cumulative effects on the wider groundwater system are considered positive and therefore less than minor.

6.2.4.2 Surface Water

Pumping groundwater can deplete surface water bodies if the water bodies are hydraulically connected to the groundwater source and the cone of depression resulting from pumping groundwater intercepts the surface water bodies.

There are a significant number of surface waterways at the site, in addition to two mapped springs and an additional groundwater seep. These surface water features can be expected to have some hydraulic connection to shallow groundwater at the site.

As stated previously, the borelog for BW24/0262 shows the presence of a nearly 5 m thick clay layer between 21.7 m and 26.6 m bgl, which is underlain by clayey gravel thereafter until a depth of nearly 70 m bgl. The proposed deep bores will target sandy gravel zones below the clay and clayey gravel layers shown in the borelog. In addition, as discussed in Section 3.1, the log for M35/9126 (situated over 2.7 km south-west from BW24/0262) also shows evidence of lower permeability strata between deep and shallow groundwater, despite the large separation between the site and this bore. As a result, new deep bores installed at the site are unlikely to have a significant degree of hydraulic connection with the shallow surface water features at the site.

To provide an estimate of the potential scale of stream depletion from deep bores operating at the site, we have carried out a stream depletion assessment using the Ward and Lough (2011¹⁹) Solution and the same aquifer parameters used for the well interference assessment. The stream bed conductance (λ) of the Ohoka Stream is assumed to be 1.04 m/day, based on previous testing carried out by PDP and reported by ECan in 1999²⁰. We note the assessment is not significantly sensitive to the separation distance between a deep abstraction bore and the individual streams, however we have conservatively assumed abstraction could occur reasonably close to a stream (50 m separation).

Based on 150 days of continuous pumping, the predicted stream depletion is calculated to be approximately 29.5 % of the pumping rate. Based on the proportion of depletion in comparison to the pumping rate, the hydraulic connection would be defined as 'low'. However, the total depletion (9.1 L/s) exceeds the 5 L/s threshold for a 'low' hydraulic connection and therefore the connection would technically be classified as 'moderate'.

¹⁹ Dudley Ward, N. and Lough, H. (November 2011) Stream Depletion from Pumping a Semiconfined Aquifer in a Two Layer Leaky Aquifer System. Journal of Hydrologic Engineering. 16(11).

²⁰ Environment Canterbury, 1999. Observations of the Ohoka Stream System in a Drought. Report No. U99/32.

With regard to management for a take with a 'moderate' degree of hydraulic connection, no flow restrictions are placed on such a groundwater take because the response time between pumping and stream depletion is delayed.

It should be noted that further to the assessment provided above, the proposal to abstract deep groundwater will also represent the cessation of abstracting larger volumes of shallow groundwater for irrigation purposes. These shallow bores can be expected to have a much greater hydraulic connection with surface water (likely defined as 'high' or possibly 'direct' under Schedule 9 for most of these bores) and therefore the net effect of the proposal can be expected to be a reduction in the stream depletion effects that currently occur through the operation of consents CRC991022 and CRC991827. Therefore, as for the effects on groundwater allocation, the effects on the surface water flow regime are also a net positive effect and the effects on surface water resources from this proposal can be considered to be less than minor.

6.2.5 The potential benefits of the activity to the applicant, the community and the environment (Matter of Discretion 5)

The proposal will provide significant economic and community benefits. These are detailed in reports prepared by Market Economics and Savvy Consulting included with the application documents.

In addition, a new water supply will add resilience to the existing supply and provide N + 1 redundancy which is not currently present at the existing WDC supply. Furthermore, the surrender of existing irrigation consents (with associated volumes larger than the proposed water supply volumes) will have a positive impact on the allocation of groundwater in the Eyre GWAZ.

Abstraction from the existing shallow irrigation bores onsite can also be expected to cause significant surface water depletion. The surrender of these consents and the proposed abstraction of deep groundwater for community supply can be expected to have a positive impact on flow in surface water features. As a result, there are considerable environmental benefits to the groundwater and surface water systems.

6.2.6 Community Drinking-water Protection Zones (Matter of Discretion 7, 8 and 9)

This section addresses matters of discretion 7, 8 and 9 under Rule 5.115 of the LWRP.

LWRP Policies 4.23, 4.23A and 4.23B require any water source used for community drinking-water supply is protected from any discharge of contaminants that may affect the quality of the drinking-water supply by a specific Community Drinking Water Supply Protection Zone (CDWSPZ). Schedule 1 of the LWRP notes that the dimensions of a specific protection zone shall form

part of any application for resource consent to take or use water for a new community drinking-water supply or the replacement of an existing permit for that purpose. The dimensions of a protection zone around a community drinking-water supply are to be determined using site specific information, including:

- ✧ The topography, geography and geology of the site;
- ✧ The depth of the bore;
- ✧ The construction of the bore;
- ✧ Pumping rates from the bore;
- ✧ The type of aquifer in which the bore is screened;
- ✧ The types of actual or potential contaminants that could pose a risk to the supply;
- ✧ The level of treatment the abstracted water will receive; and
- ✧ The potential risk to water quality.

Note that a protection zone around a bore restricts the types of activities that can occur within the zone without a resource consent.

The assessment below takes into account the factors described above and specifically both the change in vertical gradient and also travel times to the screened interval.

As described in Section 3.1 of this report, the geology underlying the site can be expected to consist of variable gravelly strata, although a thick clayey confining layer is evident in the log from BW24/0262 between around 22 to 27 m bgl with further clayey or claybound gravel present overlying deeper sandy gravels at depth. The proposed water supply bores will target deep sandy gravels (likely > 70 m deep) within a semi-confined aquifer, so that the potential yields are maximised and also to isolate the screen zones (only a single deep screen zone will be installed in each bore) from contaminants that may be derived from land use activities at the ground surface.

At present, the main potential surface derived contaminants are expected to be from agricultural land use that occurs in the area and discharges of wastewater, including domestic wastewater systems. The site will no longer be used for agricultural purposes once developed and the main discharges to ground will be stormwater (although with appropriate treatment). Wastewater disposal will be via a reticulated system with no discharges to land. The proposed abstraction of groundwater poses no real risk to the underlying groundwater quality and overall it is considered that potential impacts on groundwater quality from surface derived land use activities can be expected to reduce post-development as a result of the proposed change in land use.

With regard to risks to users of the supply, the existing WDC supply from BW24/0262 has provided high quality water suitable for a drinking-water supply. As a result, it is reasonable to assume the same will be the case for new deep supply bores (of similar depth) at the site. In addition, the supply will include a high level of treatment via chlorination and a UV system.

Further to the above, we have estimated vertical travel times under pumped conditions for new supply bores at the site. The vertical velocity of groundwater through an aquitard is defined by the following equation:

$$V = \frac{\frac{K'}{B'} \cdot \Delta h}{n}$$

Where V represents the velocity of groundwater, K'/B' represents the aquitard conductance, Δh represents the vertical gradient and n represents the aquifer porosity.

Due to the slower velocities that occur through aquitards it is appropriate to use average pumping rates to calculate the travel times. Based on the information provided in Section 5.1.1, the expected long-term average pumping rate required is around 15 L/s. However, this rate is expected to be split between up to five supply bores. For the purpose of assessment, it is conservatively assumed that a single bore (perhaps a more productive bore) may provide up to 8 L/s over the long-term.

The results of a previous step-drawdown test in BW24/0262 (PDP, 2016⁷) indicate that drawdown in that bore based on long-term operation at 8 L/s is up to approximately 40 m. For this assessment we have assumed the new supply bores will perform similarly and therefore have assumed that the largest drawdown in any one supply bore over the long-term will be 40 m. Assuming similar groundwater levels at the water table and in deep strata (there is no data to confirm the relative pressures), then Δh based on the equation above is 40 m under long-term average pumping conditions.

The average aquitard conductance (K'/B') from Table 1 is 0.000264 days⁻¹ and the average porosity (n) is assumed to be 0.1. Based on these values, the vertical velocity is estimated as 0.106 m/d.

The top of the bore screen in BW24/0262 is 78 m bgl and assuming similar screen intervals in the proposed bores, a contaminant would have to travel around 77 m from the surface to the bore screens assuming the groundwater table is 1 m bgl. At a rate of 0.106 m/d, travel over that distance would require around 726 days, or nearly 2 years to travel through the strata to the bore screen in a new supply bore.

Based on the assessments described above, the potential water quality risks to the proposed water supply bores from surface derived contaminants is

considered to be low. This is the result of multiple factors including the natural geology, the intended deep source and screen zones for the supply bores, relatively slow travel times and appropriate treatment of the intended water supply. In addition, the successful operation of existing WDC supply bore BW24/0262 provides further confirmation that a new deep water supply can be operated at low risk.

Schedule 1 of the LWRP outlines a methodology for determining preliminary CDWSPZ's and for bores >70 deep, a circular zone extending from the bore for 100 m in all directions is considered appropriate. We note that this is the size of the CDWPZ that has been established around BW24/0262 (see Figure 1). We consider that preliminary CDWPZ's of this size should be established in all new bores following construction and that these should be reviewed once the bores have been pump tested, which will confirm their performance and provide site specific aquifer parameters.

It would be advisable that new bores should be installed at least 100 m from the site boundaries. This would mean that the protection zones would not encroach on any neighbouring landowners and result in associated adverse effects related to the establishment of the CDWPZ's (caused by any additional restrictions on land use on neighbours properties). Based on that approach, the effects on neighbouring landowners of establishing new CDWPZ's around the proposed new bores would be less than minor.

7.0 Assessment of Effects – Subsoil Drainage

7.1 Scope of Potential Effects

Rules 5.131 and 5.132 of the LWRP relate to the non-consumptive taking, use and discharge of groundwater. Rule 5.131 is as follows:

The non-consumptive taking and using of groundwater, including for heating and cooling purposes, and the associated discharge to groundwater, is a permitted activity provided the following conditions are met:

- 1. The discharge of the groundwater is to the same aquifer or groundwater source as the abstraction, and the discharge is within 50 m of the abstraction point; and*
- 2. The use of water is for domestic purposes; and*
- 3. No contaminants, other than water of the same of different temperature, enter the groundwater.*

The proposed drainage system will not meet conditions 1 or 2 and of the rule and it is possible that Condition 3 is also not meet due to the potential for elevated dissolved metals in the discharge water (although the groundwater taken shall be the same quality as the groundwater to which the take will be discharged).

Where any of the conditions of Rule 5.131 are not met, Rule 5.132 is applicable and is set out as follows:

The non-consumptive taking and use of groundwater and associated discharge to groundwater that does not meet one of more of the conditions in Rule 5.131 is a discretionary activity.

Therefore, we expect resource consent is required for the non-consumptive taking, use and discharge of groundwater via the drainage system as a discretionary activity.

With regard to effects, we consider the following typical groundwater take and discharge effects for this proposal are potentially relevant to the drainage system:

- ✧ Effects on Environmental Flow and Allocation Limits
- ✧ Drawdown Interference and Impacts on Reliability of Supply for Existing Groundwater Users
- ✧ Effects on Surface Water Flows
- ✧ Effects on Water Quality
- ✧ Effects on Community Drinking-water Protection Zones

Assessments against each of these issues are provided in the following sections.

7.2 Effects on Environmental Flow and Allocation Limits

The shallow drainage water and groundwater that flows into the drains will be discharged to onsite SMA's. At times when there is ponded groundwater in the SMA's (and there is a hydraulic gradient from the drainage system to the SMA's), then the outlet into the SMA's may be submerged. However, at times when there is less or no ponding in the SMA's there may be times when the drainage water discharges to ground within the SMA's. In both instances the water will ultimately infiltrate back down to the underlying groundwater. None of the drainage flows will be lost to surface water and therefore the activity is considered non-consumptive. At times when the SMA's are discharging to surface water, this will occur when natural groundwater levels are exceeded and therefore the only water being discharged through this pathway is stormwater.

Given the non-consumptive status (water taken from the site infiltrates back to groundwater onsite), there are no predicted significant impacts on environmental flow and allocation limits and the effects are considered less than minor.

7.3 Drawdown Interference and Impacts on Reliability of Supply for Existing Groundwater Users.

As discussed in Section 5.2, it is estimated that the maximum flow and discharge through the drainage system will be up to 10 L/s. However, the discharge will also be onsite and will recharge back to the underlying groundwater. Therefore, any small, localised drawdown in the locations of the drains will be offset away from the drains by the discharge of the same water back to the site. The non-consumptive nature of the activity and the small, localised drawdown that will occur will be such that no significant offsite effects are anticipated.

Further to the above, we note that existing resource consents CRC991022 and CRC991827 that allow for large quantities of shallow groundwater to be abstracted at the site will be surrendered following development. While it is proposed that deep groundwater will be abstracted for community supply purposes, the net effect of surrendering the irrigation consents will be a significant decrease in the currently consented drawdown interference effects in shallow neighbouring bores. This was demonstrated in Section 6.2.3 of this report.

Any localised drawdown effects from the drainage system will also be at times when groundwater levels are high. When groundwater levels are low (which is when shallow groundwater abstraction bores are most vulnerable to drawdown interference), the drainage system will be elevated above the water table and there is unlikely to be any flows from the drainage system (except after rainfall events when excess soil water is being drained).

Based on the information provided above, the drainage system will cause only minimal localised drawdown that will be offset away from the drains by the discharge of the same water back onsite. Therefore, offsite drawdown effects are not anticipated, and the effects are considered less than minor. The actual effects of the development are expected to be a significant reduction in drawdown interference effects in neighbouring shallow bores due to the surrender of existing irrigation onsite.

7.4 Effects on Surface Water Flows

Due to the non-consumptive nature of the drainage system (the system will discharge at the onsite SMA's over a large area of the site) there are no anticipated adverse effects on surface water flows. We note the expected maximum flows from the system are only 10 L/s, but this is predicted to occur over a 28 km length of drainage system (0.00036 L/s per m).

Given that the drainage system will be non-consumptive, any potential concerns on surface water flow would only be local, such as potential effects on individual springs at the site. However, based on the predicted average rate of drainage per metre given above, in reality we don't anticipate any significant impacts on

spring flows. Therefore, any potential effects on surface water flows are considered to be less than minor.

7.5 Effects on Water Quality

Groundwater quality sampling carried out by PDP at the site indicates that shallow groundwater can contain elevated concentrations of dissolved metals.

However, the water intercepted by the drains will be discharged onsite to the stormwater basins where it will recharge back to groundwater. None of the drainage water will be lost to surface water except in instances during storm events when groundwater levels are above their natural range. However, at these times the water leaving the site will be surface runoff which is likely to have higher metals concentrations than the discharges from the drainage system.

Given the proposal represents the taking of shallow groundwater and the discharge back onsite of the same quality water back to groundwater, no adverse water quality impacts are anticipated. In fact, in cases where there is no ponding of water in the SMA's during discharge of drainage flows, significant removal of metals from the discharge water is likely to occur prior to recharging the underlying groundwater.

Based on the assessment detailed above, the potential effects on water quality are considered less than minor.

7.6 Effects on Community Drinking-water Protection Zones

As per the information provided in the previous section on water quality, the same water that will be removed by the drainage system will be discharged back to groundwater (with an expected reduction in metals concentrations in the basins prior to infiltration back to groundwater). Therefore, we don't consider there to be any potential adverse impacts if any discharges were occurring into the CDWPZ's that will be established onsite in the future (for the deep community supply bores). However, we also understand the SMA's where the drainage flows will be disposed of will not intercept the onsite CDWPZ's, or the existing CDWPZ for WDC bore M35/5609

Overall, we consider the potential effects on CDWPZ's are less than minor.

8.0 Conclusion

The assessments detailed in this report have shown that the effects of taking and using groundwater for community supply purposes via deep semi-confined strata to service a new residential and commercial development at Ōhoka will result in the following positive environmental effects:

- ✧ A reduction in groundwater allocation within the Eyre GWAZ (due to surrender of existing large volume irrigation consents that authorise abstraction from shallow bores).
- ✧ A reduction in drawdown interference effects in neighbouring bores due to cessation of pumping from the onsite shallow irrigation bores and a shift to abstraction (at lower volumes) from deep bores.
- ✧ A reduction in the stream depletion that currently occurs as a result of abstracting from the onsite shallow irrigation bores. New deep community supply bores will have lower hydraulic connection with surface water.

In addition to the positive effects indicated above, further assessments have indicated that other potential environmental effects of the proposal are less than minor and therefore it is considered appropriate to grant the proposed consent application for a new community drinking water supply.

Further assessments relating to the taking, use and discharge of groundwater for land drainage purposes has shown the proposal is non-consumptive and the same groundwater that will be intercepted by the drainage system will discharge to the site SMA's, with no loss of groundwater from the site. The environmental effects of the proposed drainage system have been assessed as less than minor and therefore it is also considered appropriate to grant the relevant consents for this activity.

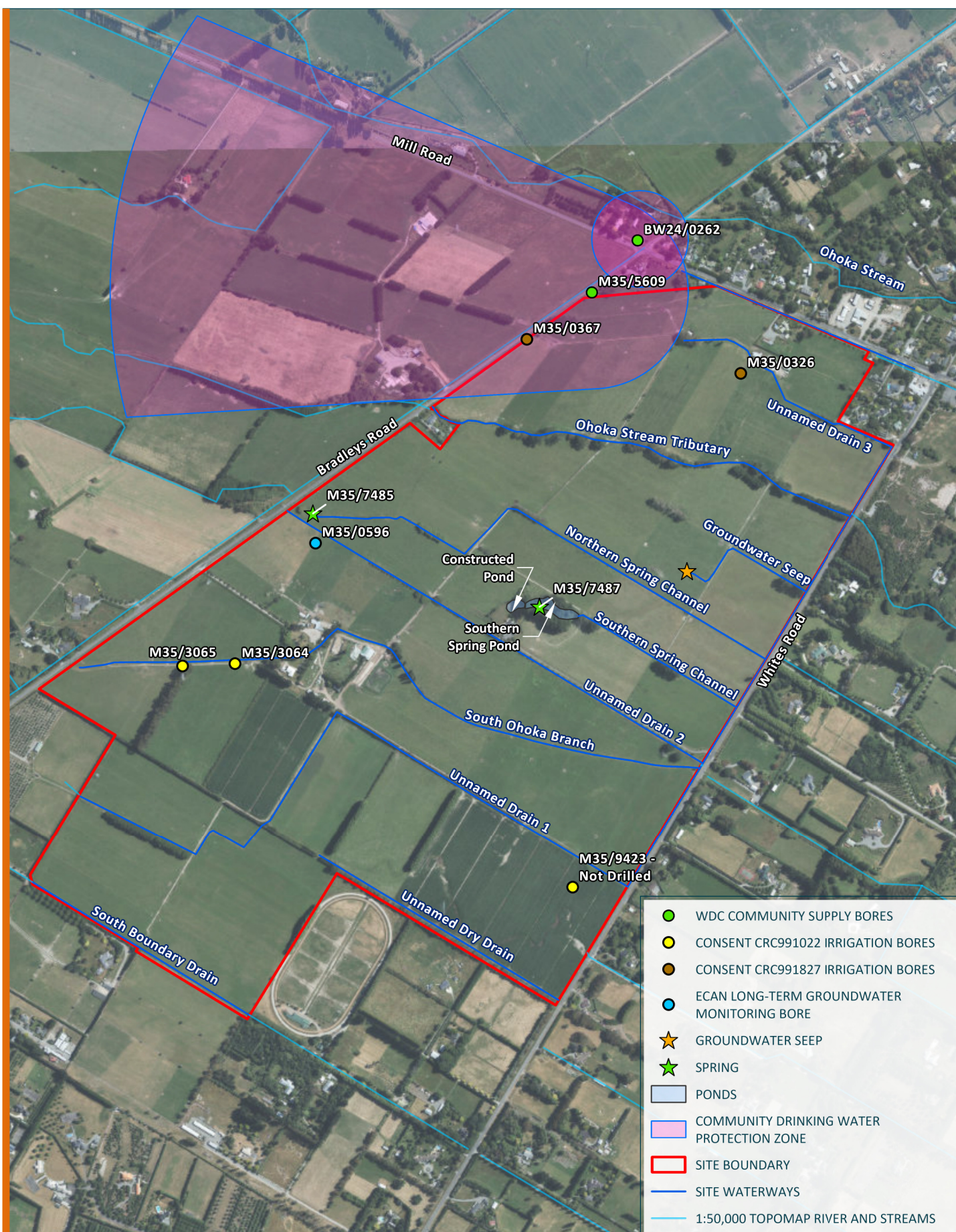


FIGURE 1: SITE DETAIL

531 AND 535 MILL ROAD OHOKA - DEWATERING
ASSESSMENT OF ENVIRONMENTAL EFFECTS

SOURCE:

1. AERIAL IMAGERY: EAGLE TECHNOLOGY, LINZ, STATSNZ, NIWA, NATURAL EARTH, © OPENSTREETMAP CONTRIBUTORS., EAGLE TECHNOLOGY, LAND INFORMATION NEW ZEALAND, EAGLE TECHNOLOGY, LAND INFORMATION NEW ZEALAND, GEBCO, COMMUNITY MAPS CONTRIBUTORS.
2. CDWPZ AND LINZ TOPOMAP RIVER LINES RETRIEVED FROM CANTERBURY MAPS, JAN 2025.
3. SPRINGS AND SEEPS IDENTIFIED FROM SITE WALKOVERS.

0 150 300
METRES

SCALE : 1:10,500 (A4)

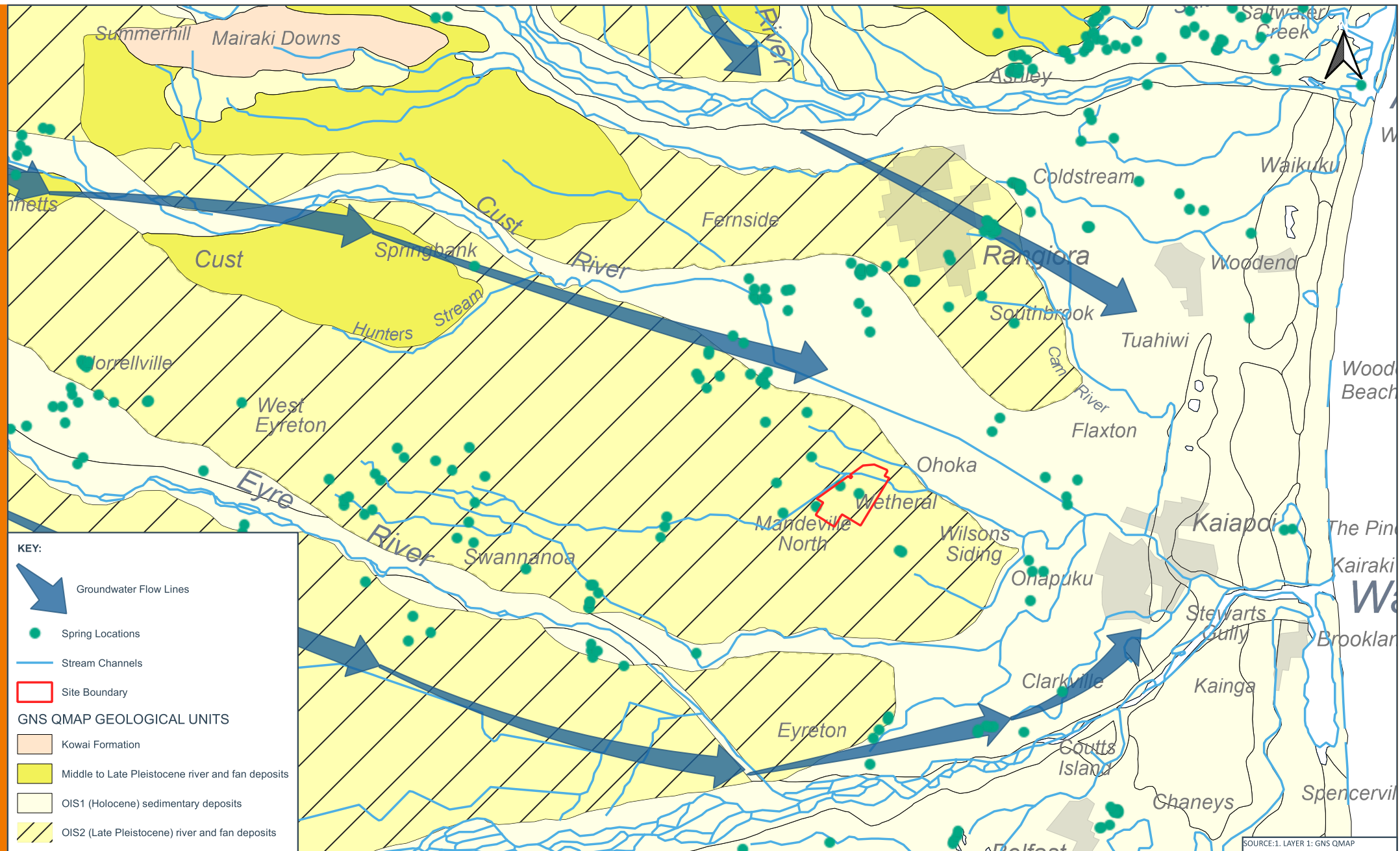
REVISION: 01 | DATE: JUL 25 | BY: CF
CLIENT: CARTER GROUP LTD

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C045180002R003_FIG1

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FIGURE 2: GENERAL LAYOUT PLAN PROVIDED BY INOVO



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NO.	REVISION	DATE	BY

CLIENT
CARTER GROUP LTD

FIGURE
FIGURE 3: GROUNDWATER FLOW PATHS AND HYDROGEOLOGICAL SETTING

PROJECT
531 AND 535 MILL ROAD OHOKA - DEWATERING ASSESSMENT OF ENVIRONMENTAL EFFECTS

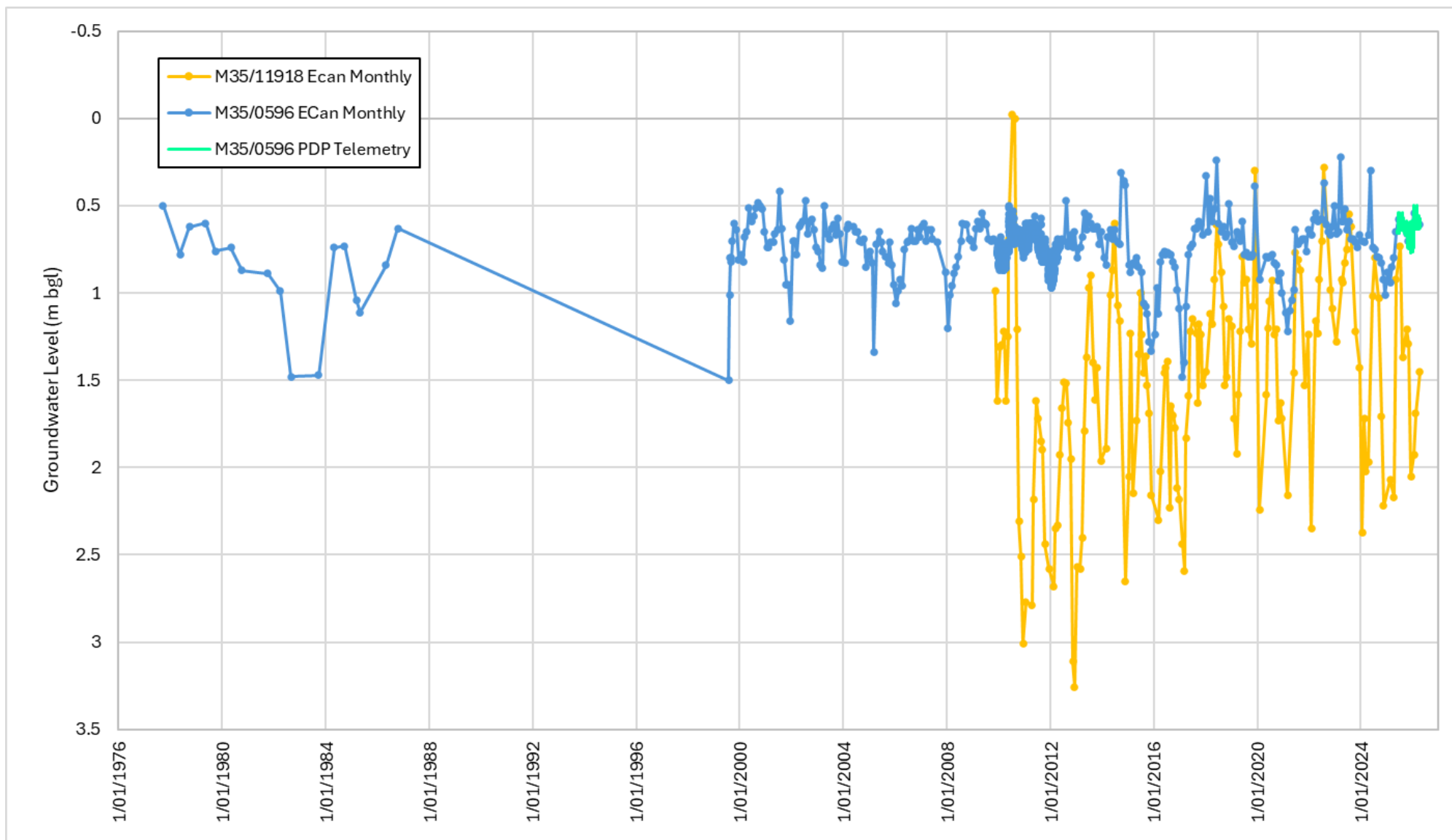
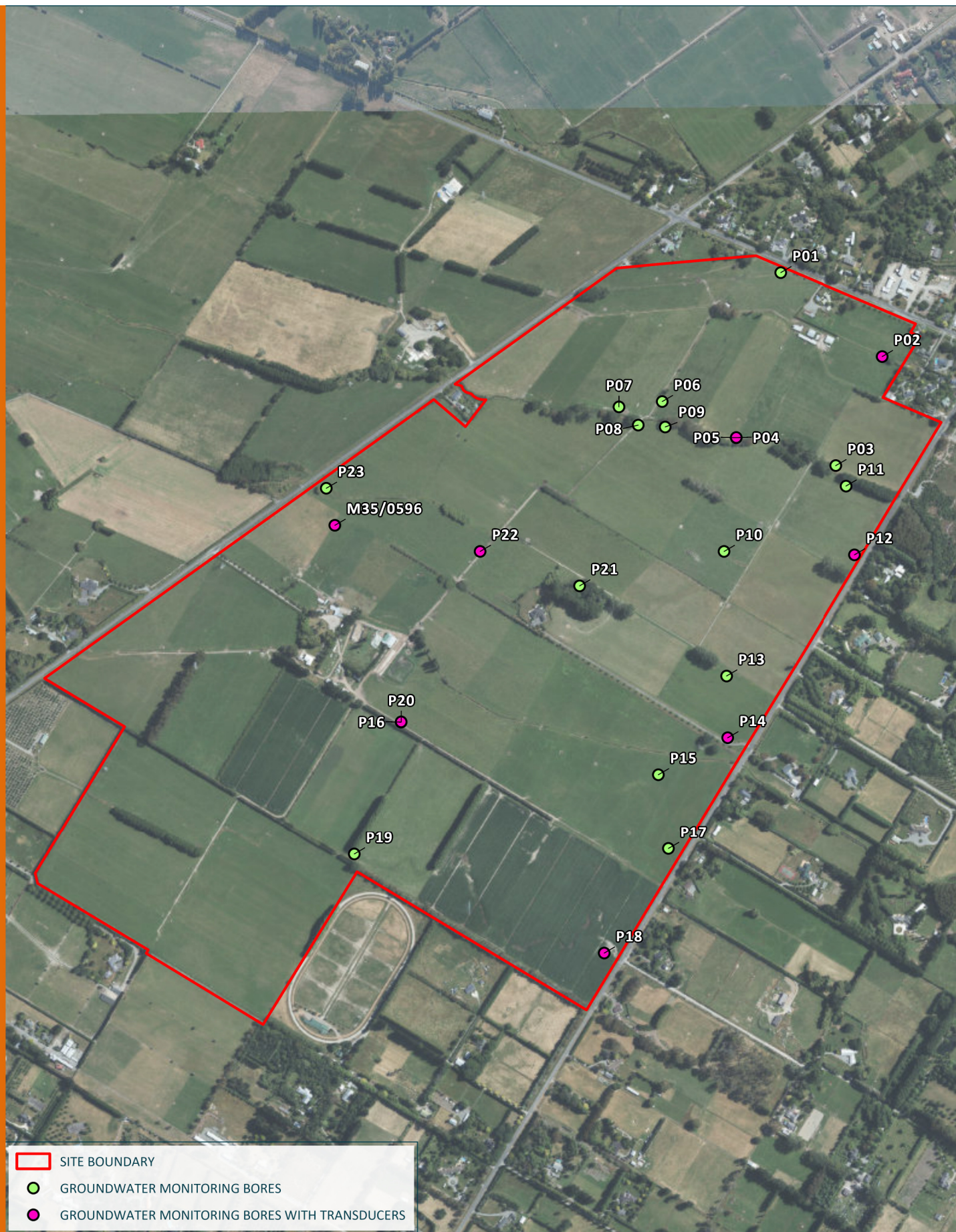


FIGURE 4: GROUNDWATER LEVEL RECORDS IN M35/0596 AND M35/11918



- SITE BOUNDARY
- GROUNDWATER MONITORING BORES
- GROUNDWATER MONITORING BORES WITH TRANSDUCERS



FIGURE 5: NEW GROUNDWATER MONITORING BORES

531 AND 535 MILL ROAD OHOKA - DEWATERING ASSESSMENT OF ENVIRONMENTAL EFFECTS

SOURCE:
 1. AERIAL IMAGERY: EAGLE TECHNOLOGY, LINZ, STATS NZ, NIWA, NATURAL EARTH, © OPENSTREETMAP CONTRIBUTORS., EAGLE TECHNOLOGY, LAND INFORMATION NEW ZEALAND, EAGLE TECHNOLOGY, LAND INFORMATION NEW ZEALAND, GEBCO, COMMUNITY MAPS CONTRIBUTORS.

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SCALE : 1:10,000 (A4)

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N

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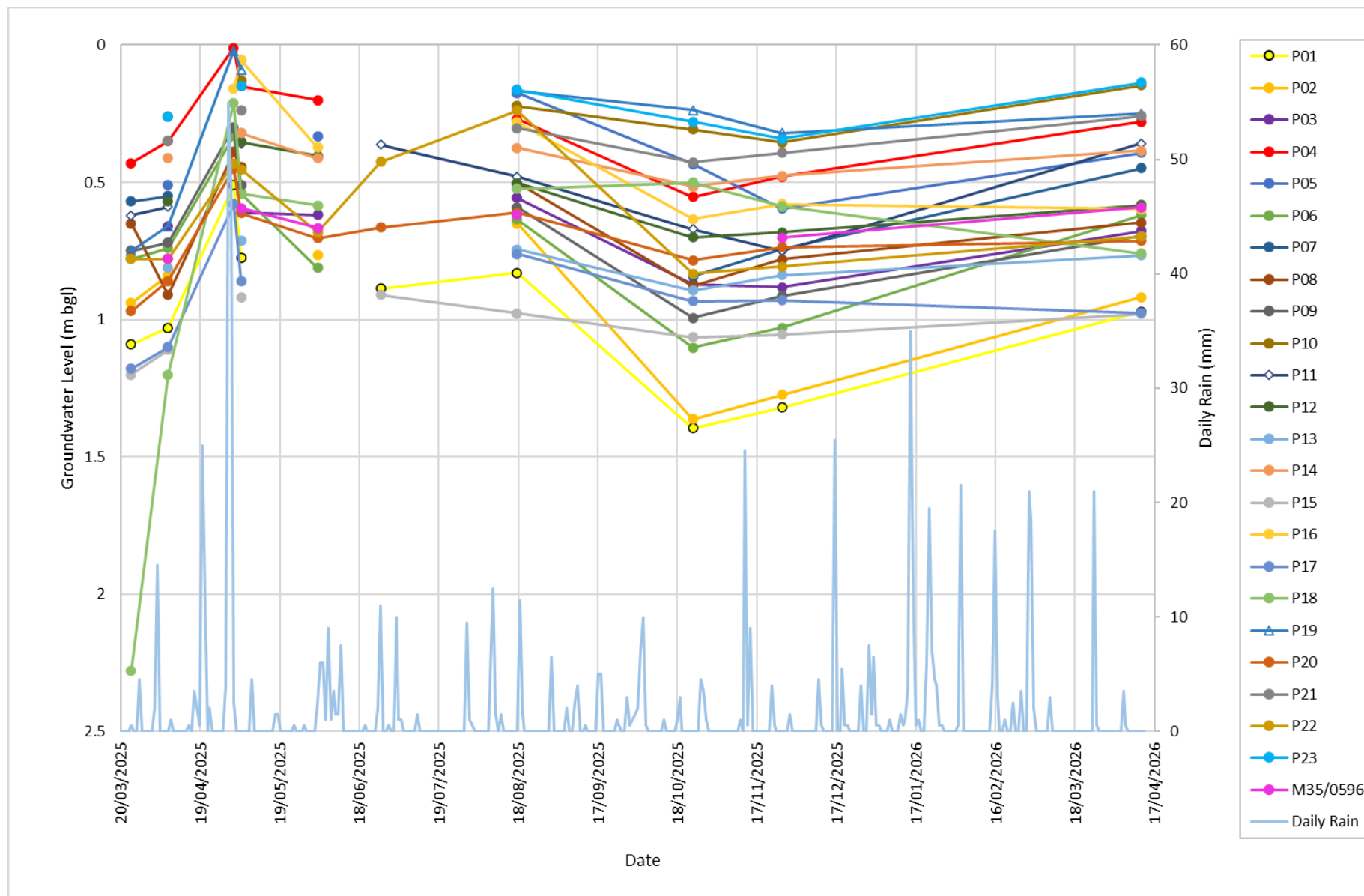


FIGURE 6A: GROUNDWATER LEVEL RECORDS IN M35/0596 AND M35/11918

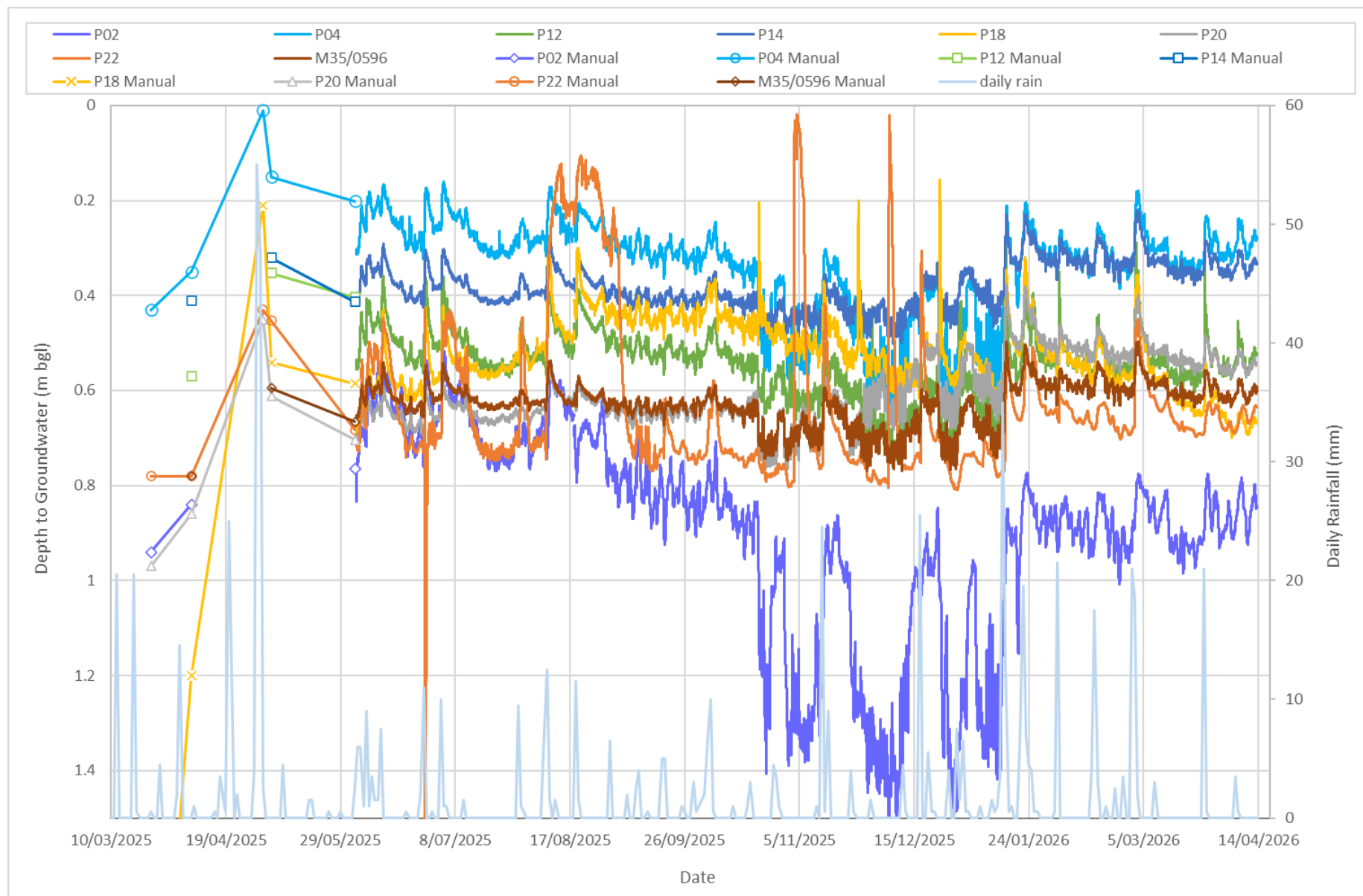


FIGURE 6B: GROUNDWATER LEVEL RECORDS IN TRANSDUCER MONITORING BORES

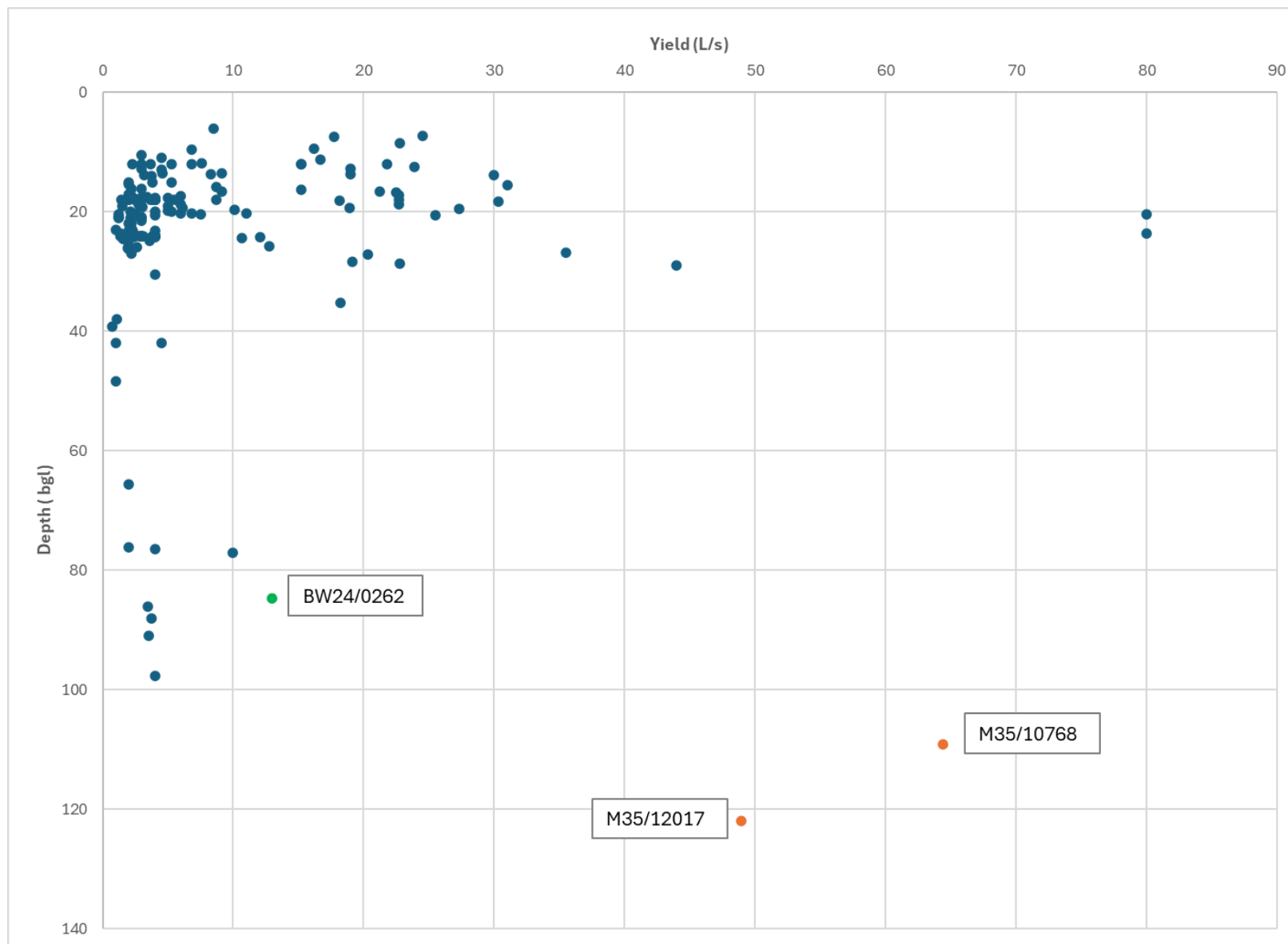
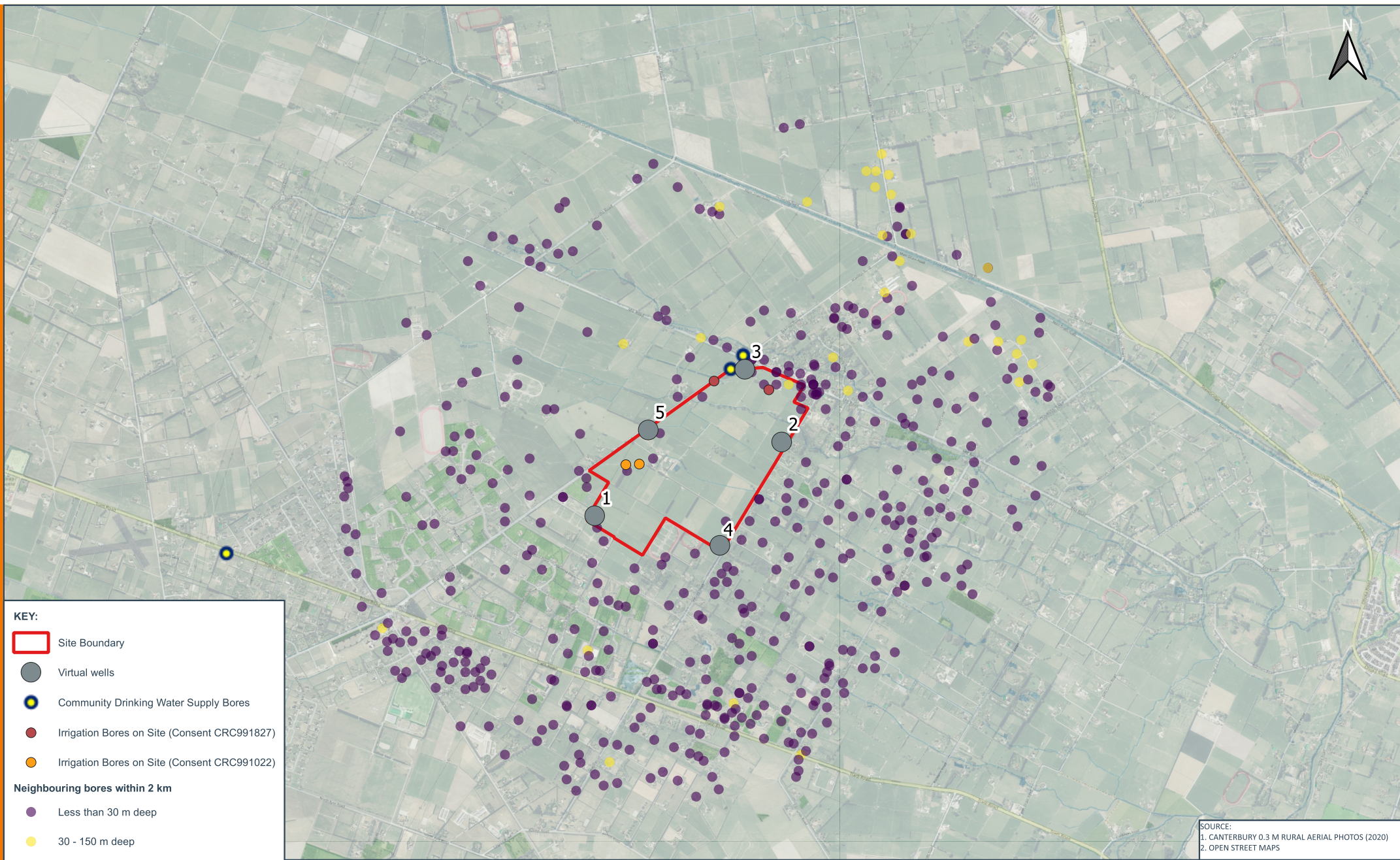


FIGURE 7: DEPTH VERSUS YIELD FOR BORES WITHIN 2KM OF SITE



FIGURE 8: PROPOSED SUBSOIL DRAINS



KEY:

- Site Boundary
- Virtual wells
- Community Drinking Water Supply Bores
- Irrigation Bores on Site (Consent CRC991827)
- Irrigation Bores on Site (Consent CRC991022)

Neighbouring bores within 2 km

- Less than 30 m deep
- 30 - 150 m deep

SOURCE:
1. CANTERBURY 0.3 M RURAL AERIAL PHOTOS (2020)
2. OPEN STREET MAPS



0 400 800 1,200 m
METRES
SCALE : 1:40,000 (A4)

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A	FINAL	JUL 25	FS
NO.	REVISION	DATE	BY

CLIENT
ROLLESTON INDUSTRIAL
DEVELOPMENTS LTD

FIGURE
FIGURE 9: VIRTUAL BORE LOCATIONS AND NEIGHBOURING BORE DEPTHS

PROJECT
WATER SUPPLY ASSESSMENT - OHOKA FAST TRACK APPLICATION



Carl Steffens

TECHNICAL DIRECTOR – WATER RESOURCES

Carl is a hydrogeologist with over 20 years experience working on and managing groundwater projects throughout NZ.

Qualifications

BSc Geological Sciences, 2001, University of Canterbury

PGDipSci (Engineering geology), 2004, University of Canterbury

Affiliations

Member of New Zealand Hydrological Society

Career Summary

2004 – Present

Technical Director – Water Resources,
Pattle Delamore Partners Ltd,
Christchurch

CORE EXPERTISE

- ✦ Groundwater resource evaluation and modelling
- ✦ Groundwater sampling and monitoring
- ✦ Hydrogeological field testing
- ✦ Construction dewatering
- ✦ Resource consent assessments and applications
- ✦ Preparation and presentation of evidence for hearings
- ✦ Project management

MANAGEMENT EXPERIENCE

- ✦ PDP Groundwater Services Leader
- ✦ Experienced Project Manager and Technical Lead

CAREER SUMMARY

Carl has broad experience in hydrogeological field testing, monitoring and sampling, data interpretation/analysis, analytical and numerical modelling and reporting. Carl has been involved in the preparation of Assessment of Environmental Effects (AEE) reports for consent applications and presenting evidence as an expert witness at hearings.

He has worked on a broad range of construction related groundwater projects including projects relating to construction dewatering, stormwater basins, wastewater systems, roading developments and subdivisions. He also has extensive experience on irrigation projects.

Carl has provided assistance to local councils including CCC on the development of groundwater drinking water supply sources including consenting requirements. He has also worked on projects for various regional councils throughout the country including ECan.

PROJECT EXPERIENCE

Aurecon

Technical assessment of construction dewatering rates and assessment of effects to support resource consent application for Parakiore Recreation and Sports Facility.

Brian Perry Civil

Construction dewatering advice relating to civil works across Cashmere Stream at Eastman Wetlands.

Christchurch City Council

Groundwater assessments, pump testing and preparation of resource consent applications for new Christchurch City Community Drinking-water Supply bores at various city pumping stations.

Christchurch City Council

Groundwater assessments and/or monitoring relating to proposed stormwater infiltration, retention and wetland sites including Milns Basin (Eastman Wetlands) Worsleys Basin and Quaifes Road.

Confidential Client

Hydrogeological investigations and numerical modelling of dewatering requirements and groundwater management issues associated with proposed open cast mine developments.

Danne Mora Holding Ltd

Development of a Modflow numerical groundwater flow model to assess potential drainage flows to permanently lower the water table at a proposed residential subdivision.

Environment Canterbury

Technical review of various resource consent applications for the taking, use and discharge of groundwater within Canterbury.

Fire and Emergency New Zealand

Assessment of effects relating to construction dewatering associated with site redevelopment at various fire station sites. Preparation of resource consent application to take, use and discharge groundwater for dewatering purposes.

Foodstuffs (South Island) Properties Limited

Assessment of dewatering impacts relating to proposed construction works at Foodstuffs Prestons Road site, Christchurch.

Fulton Hogan Limited

Field investigations including slug testing and stream gauging, data analysis, hydrogeological modelling and predictions of groundwater flows emerging from a groundwater drainage system installed beneath the roading network at Longhurst subdivision, Halswell.

Gillman Wheelans Limited

Field testing and assessments relating to new community groundwater supply bores, construction dewatering relating to service installation, dewatering induced settlement and associated resource consenting for various subdivision developments within Canterbury.

New Zealand Transport Agency

Preparation and presentation of evidence at a resource consent hearing relating to an application by NZTA to Waimakariri District Council for the alteration of a

designation and the construction of a State Highway realignment and the widening of an existing State highway in relation to the Woodend Short Eastern Alignment.

Ngāi Tahu Property Limited

Hydrogeological assessments to support dewatering and excavation consent applications relating to a multistorey car park building in central Christchurch.

Prestons Road Limited

Quantifying groundwater inflows into proposed stormwater management basins and wetlands at a Christchurch residential development. Hydraulic onsite testing including piezo installation, trench excavation, pumping trials and slug testing. Data interpretation and analysis and estimates of groundwater inflows via analytical flow models.

Rae Paenga

Numerical modelling and review of contractor dewatering methodology at Parakiore Recreation and Sports Facility. Expert witness at arbitration hearing between Principle and Contractor.

University of Canterbury

Field testing, design and analysis of a large-scale groundwater dewatering system involving direct discharge of large dewatering flows to multiple re-injection bores for construction of the University biosciences building. Other specialist groundwater services for UC relating to construction dewatering and groundwater sourced air condition systems.

Various clients

Technical assessments and preparation of resource consent applications to take, use and discharge groundwater for heating and cooling purposes, including for cooling computer servers at data centres, at various sites within Christchurch City.

Various clients

Supervision of field investigations including the drilling and installation of groundwater abstraction/monitoring bores. Groundwater quality sampling and groundwater level monitoring.

Various clients

Preparation of assessment of environmental effects (AEE) reports for groundwater take, use and discharge consent applications. Assessments of potential well yields, interpretation and analysis of pumping test data, well interference and groundwater mounding assessments associated with groundwater takes and discharges, interaction of surface water and groundwater, groundwater quality assessments, sea water intrusion assessments, design of groundwater level and quality monitoring programmes, analytical and numerical modelling applications.

West Coast Regional Council

Advising and technical reviews of resource consent applications to vary existing discharge resources consents held by Taylorville Resource Park Limited near Greymouth.

Nic Love

SERVICE LEADER – WATER RESOURCES



Nic is a service leader specialising in groundwater with over ten years of experience working at PDP's Christchurch Office. He has experience in surface water and groundwater resource assessments and consenting including water supply scoping and consenting, dewatering assessments, undertaking drawdown interference effects on neighbouring bores, assessments of stream depletion effects and aquifer testing analysis. Nic has extensive fieldwork experience in groundwater and surface water quality and level monitoring.

Qualifications

BSc (Geology), 2014, University of Canterbury

PMEG (Engineering Geology), 2015, University of Canterbury

Affiliations

Member of New Zealand hydrological Society

Training

Basic first aid

Site Safe Consultant Passport

Career Summary

2023 – Present

Service Leader – Water Resources, Pattle Delamore Partners Ltd, Christchurch

2021 – 2023

Senior Hydrogeologist, Pattle Delamore Partners Ltd, Christchurch

2016 – 2021

Hydrogeologist, Pattle Delamore Partners Ltd, Christchurch

2014 – 2015

Geophysicist (Summer Position), Shell Todd Oil Services, New Plymouth

CORE EXPERTISE

- ✦ Shallow groundwater level investigations, including piezometric contouring and assessing interactions with surface waterways
- ✦ Groundwater mounding assessments to assist stormwater infrastructure design
- ✦ Dewatering assessments and preparation of dewatering management plans
- ✦ Council hearing evidence preparation and attendance
- ✦ Resource consent technical assessments
- ✦ Pumping test analysis
- ✦ Drawdown interference analysis
- ✦ Stream depletion analysis
- ✦ Field supervision and testing
- ✦ Technical peer review of consent applications
- ✦ Delineating source water risk management areas

CAREER SUMMARY

Nic is an experienced hydrogeologist specialising in groundwater and consenting issues and has been involved with a large number of projects within New Zealand, including those relating to shallow groundwater implications for civil projects as well as water supply projects. These projects include the planning and consenting of dewatering activities for the installation of underground services or building foundations, and groundwater mounding assessments to determine potential effects from stormwater disposal on shallow groundwater and drawdown interference and stream depletion assessments for groundwater abstractions. Nic also has experience appearing as an expert witness at resource consent hearings.

Nic has routinely been involved in planning and completion of new groundwater supplies and has been involved with feasibility studies, site scoping, overseeing drilling operations, source protection zone delineation (where applicable) and preparation of resource consent applications throughout New Zealand.

Nic is proficient in the use of GIS systems, Excel and analytical solutions for modelling groundwater abstraction drawdown interference, stream depletion and mounding effects.

SELECTED PROJECT EXPERIENCE

Christchurch City Council - Technical Water Resources Advice

Hydrogeologist

Construction supervision for a number of new public supply bores within Christchurch. Technical advice on bore development and aquifer testing and delineation of source protection zones. Analysis of aquifer test data and assessment of stream depletion and well interference for multiple pumping stations for global groundwater abstraction consent.

Marlborough District Council - Assessment of New and Existing Community Supply Bores

Hydrogeologist

Undertaking scoping studies, assessments of stream depletion, saline intrusion and drawdown interference effects for a number of new and proposed public water supply bores for various townships, including Blenheim, Havelock, Picton and Riverlands. Preparing resource consent applications and presenting evidence at a resource consent hearings where required.

Southland District Council - Various Drinking water Supply Consenting Projects

Hydrogeologist

Preparation of resource consent applications for the renewal of several community drinking water supplies, including Tuatapere, Otautau and Te Anau. Technical work involving aquifer testing analysis and Assessments of Environmental Effects.

Christchurch City Council - Assessment of Shallow Groundwater Levels and Water Balance Assessment for Blakes Road Stormwater Facility – Belfast, Christchurch

Hydrogeologist

Assessing on site shallow groundwater level data to estimate a high groundwater level surface to aid in the design of a proposed council stormwater facility. Preparation of a water balance assessment based on the as-built plans to determine the overall groundwater loss to surface water to assist with resource consenting aspects of the project.

Christchurch City Council - Assessment of Shallow Groundwater Levels and Water Balance Assessment for Clare Park Stormwater Facility – Burwood, Christchurch

Hydrogeologist

Assessing nearby shallow groundwater level data to estimate a high groundwater level surface within a proposed extension of a council stormwater facility. Preparation of a water balance assessment based on the as-built plans to determine whether groundwater will be discharged to downstream stormwater basins.

Christchurch City Council - Shallow Groundwater Investigations at Cranford Basin – Papanui, Christchurch

Hydrogeologist

Drilling supervision for a number of groundwater level monitoring bores, including hydraulic conductivity testing and long-term groundwater level monitoring to assist with the stormwater infrastructure design for the site.

Eliot Sinclair - Shallow Groundwater Level Assessment – Prebbleton

Hydrogeologist

Estimation of high groundwater levels at a proposed subdivision, based on linear correlation on site groundwater level data, nearby long-term groundwater level monitoring data and elevations of spring-fed streams.

Ngai Tahu Property – Shallow Groundwater Level Changes as a Result of Sea Level Rise – Aranui, Christchurch

Hydrogeologist

Estimation of changes in shallow groundwater levels at a proposed subdivision as a result of various sea level rise projections under different climate change scenarios, to assist with stormwater design for the site.

Danne Mora Residential – Groundwater Discharge from Subsurface Drainage System – Halswell, Christchurch

Hydrogeologist

Estimation of drainage flows from a proposed subsurface drainage system beneath a residential subdivision, including an assessment of environmental effects for the discharge of drainage flows to a surface waterway.

Foodstuffs South Island Limited - Dewatering Assessment – Halswell Road, Christchurch

Hydrogeologist

Preparation of a dewatering assessment to facilitate the resource consenting process for the construction of a new Pak'nSave supermarket, including groundwater sampling in order to characterise background groundwater quality.

Aurecon – Dewatering Assessment – Halswell Road/SH75 Christchurch

Hydrogeologist

Preparation of a dewatering assessment to facilitate the resource consenting process for the upgrade of roading infrastructure and underground services along a 2.7 km stretch of road corridor.

Ministry for the Environment - Technical Guidelines for Drinking Water Source Protection Zones

Author

Co-author of technical guidelines for the delineation of both groundwater and surface water drinking water source protection zones including specifications for a 'default' national approach. The report was commissioned as part of the Review of the National Environmental Standard for Sources of Human Drinking Water. Further advice to MfE on changes to the NES.

Peter Callander

Technical Director – Water Resources



Peter is a Director of Pattle Delamore Partners Ltd and a water resources scientist with specialty in groundwater. He has been involved in the investigation and management of a range of water resource assessments and engineering projects involving evaluation of groundwater conditions, private and community drinking-water supply wells, several large community irrigation scheme projects, community landfill assessments, de-watering evaluations, hydro power developments and regional groundwater resource investigations and associated management issues.

He holds a current practicing certificate as an Independent Hearing Commissioner and has served on hearing panels dealing with wastewater discharges to surface waterways and land, irrigation and groundwater abstractions.

Qualifications

B.Sc. (Geology), University of Auckland, 1982

M.Sc. (Engineering Geology), University of Waterloo, Canada, 1984

Affiliations

New Zealand Hydrological Society

Water NZ

National Groundwater Association (USA)

Career Summary

1991 – Present

Senior Hydrogeologist/(1996 – 2021 Director), Pattle Delamore Partners Ltd, Christchurch

1984 - 1991

Hydrogeologist (1989 – Groundwater Group Leader), Canterbury Regional Council (formerly North Canterbury Catchment Board and Regional Water Board), Christchurch

EXPERTISE

- ✦ Technical review of consent applications and effects of the proposed activity on the hydrogeological environment
- ✦ Investigation, assessment and management of water resources
- ✦ Environmental effects in soils and water arising from land use and discharge activities
- ✦ Characterisation of contaminants in soil, surface water and groundwater
- ✦ Assessment of water availability and water allocation
- ✦ RMA Hearing Commissioner

MANAGEMENT EXPERIENCE

- ✦ Project Manager, Project Director for a wide range of consulting projects
- ✦ Team Leadership (Technical and Office management)
- ✦ Leader of Canterbury Regional Groundwater Group 1990-91

CAREER SUMMARY

- ✦ Specialist groundwater training at the University of Waterloo
- ✦ Certification as an Independent Hearing Commissioner and sitting of hearing panels for Horizons Regional Council, Gisborne District Council, Greater Wellington Regional Council and Northland Regional Council.
- ✦ Hydrogeologist at the North Canterbury Catchment Board and Canterbury Regional Council, involved with a wide range of groundwater field investigations and data analysis
- ✦ Established and managed the development of the PDP Christchurch office which has expanded from being primarily based on groundwater and contaminated land to a wide ranging environmental and engineering consultancy based on land and water management issues

PROJECT EXPERIENCE

Otago Regional Council

Peer Reviewer

Peer review of several technical reviews/assessments of consent applications prepared by the PDP water resources team. The consent applications covered a range of activities including surface water takes, groundwater takes, discharges to land and wastewater.

Ministry for the Environment

Project Management/ Hydrogeologist

Review of methodologies to define source protection zone for drinking-water supplies drawn from groundwater and surface water for consideration in the National Environmental Standard for Sources of Human Drinking Water.

Central Plains Water Services Ltd

Hydrogeologist

Provided expert evidence of Christchurch City Council, Christchurch International Airport Ltd, Waimakariri Irrigation and a quarry operators group at hearings for this 60,000 ha community irrigation scheme. Subsequently appointed to the Groundwater Surface Water Expert Review Panel overseeing the environmental effects arising from the scheme development.

Canterbury Waste Services Ltd

Project Management/ Hydrogeologist

Project management of the hydrogeologic evaluation of the Canterbury region to select potential sites for new regional landfill. Detailed evaluation of the Kate Valley site.

Christchurch City Council

Project Management/ Hydrogeologist

Assessment of water supply well siting, design and operation and modelling contamination risks. Options for stormwater disposal via ground soakage throughout Christchurch City.

Christchurch International Airport Ltd

Project Management/ Hydrogeologist

Investigation and advice on groundwater abstraction and ground contamination issues, involving stormwater discharge, fuels storage and solid waste disposal facilities.

Environment Canterbury

Hydrogeologist

Member of the Technical Lead Advisory Group to assist and review work by ECan technical investigations for the development of Plan Change 7 to the Canterbury Land and Water Regional Plan.

Fonterra Ltd

Project Management

Management of re-consenting projects for wastewater management at Edendale (Southland), Hautapu (Waikato), Reporoa (Waikato) and Brightwater (Tasman), including assessments of the Best Practicable Option and liaison with regional councils and district councils.

Gisborne District Council

Hearing Commissioner

Independent Hearing Commissioner for Regional Freshwater Plan and consent applications for coastal stormwater discharges and Managed Aquifer Recharge

Horizons Regional Council

Hearing Commissioner

Independent Hearing Commissioner for consent applications for groundwater abstractions, waste water discharges and provision of advice on water allocation issues.

New Zealand Defence Force

Hydrogeologist

Hydrogeological assessment of potential contaminant migration from Woodbourne airbase, including old waste disposal pits, to downgradient farmer's property in relation to a compensation claim, which was successfully refuted through the presentation of evidence in the High Court. Environmental clean-up of underground storage tank structures and munitions disposal area. Evaluation of PFAS contamination issues.

Northland Regional Council

Hearing Commissioner

Independent Hearing Commissioner for consideration of multiple groundwater abstraction consents for irrigation sourced from the Aupouri Aquifer.

Tasman District Council

Hydrogeologist

Evaluation of remediation for former Fruit growers Chemical Corporation contaminated site at Mapua. Member of expert peer review panel for remedial works at the site

TrustPower Ltd,

Project Management/ Hydrogeologist

Managing the assessment of groundwater issues related to consenting for Matahina Dam, proposed Wairau Valley Hydro-Electric Power Scheme, and Wahapo power scheme.

Waimakariri Irrigation Ltd

Project Management

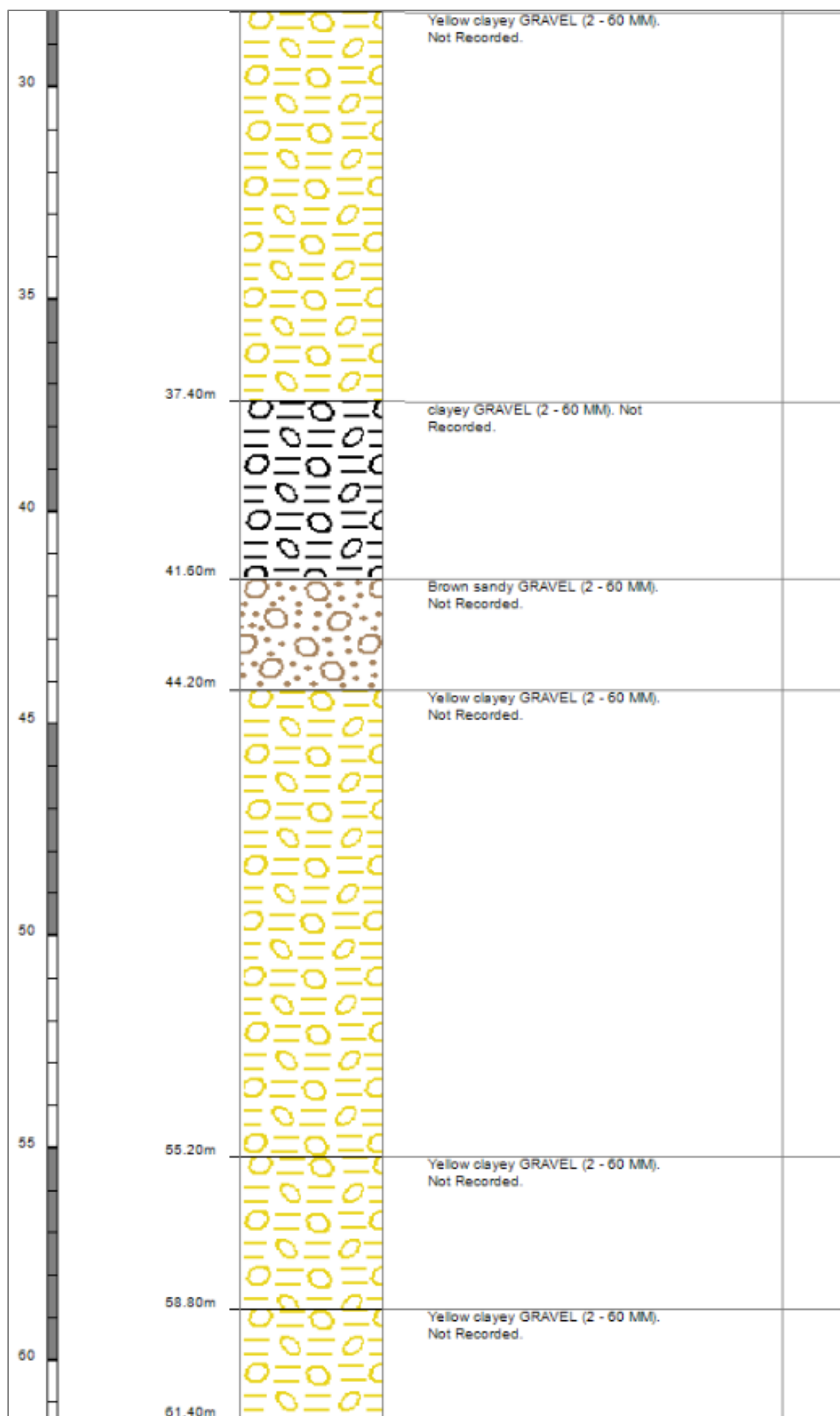
Managing the environmental assessment and consenting of a 16 m³/s irrigation and stock water supply scheme with a 40,000 ha command area sourced from the Waimakariri River with provision for artificial recharge of aquifers and power generation opportunity.

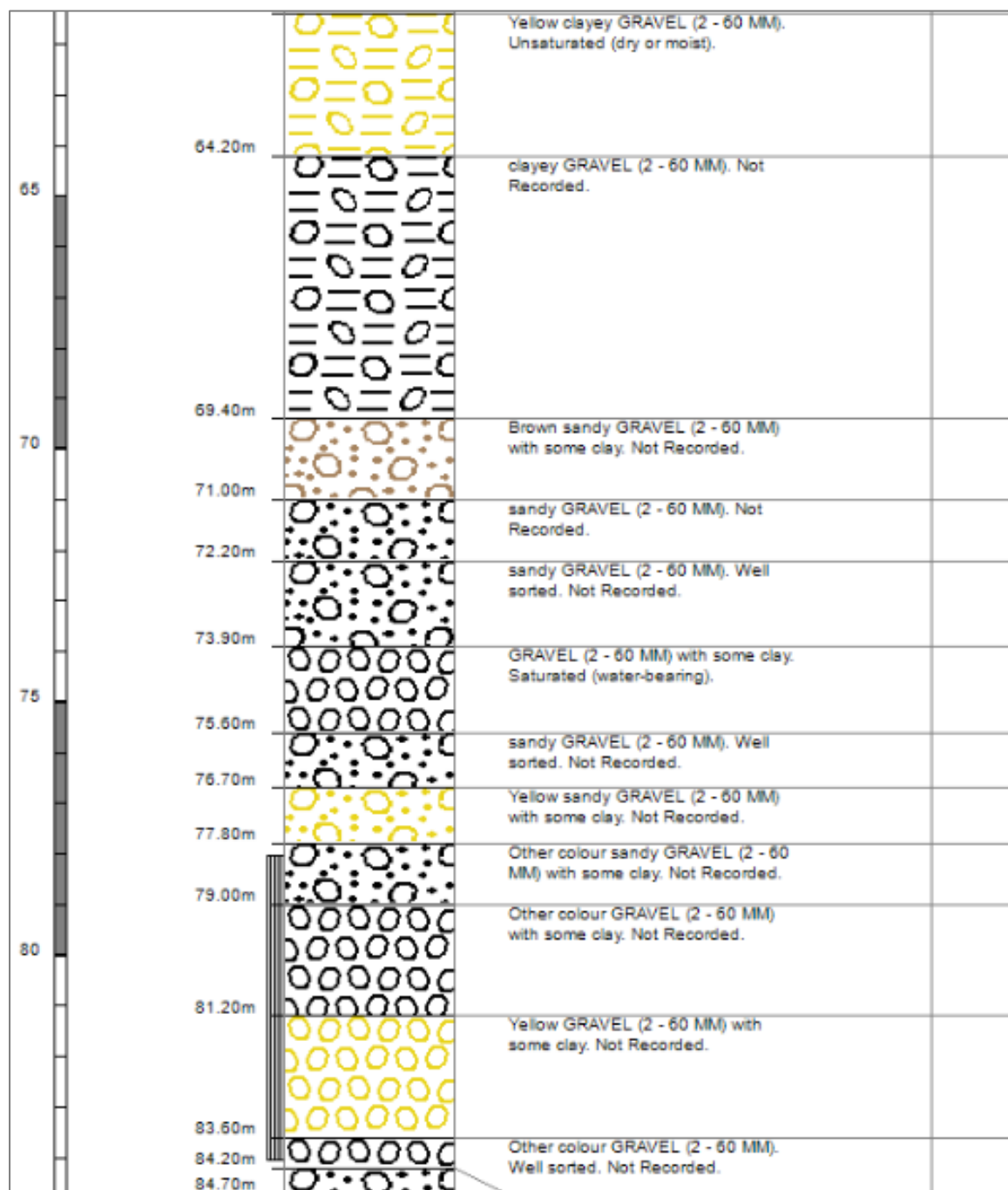
Borelog for well BW24/0262

Grid Reference (NZTM): 1565132 mE, 5199018 mN
 Location Accuracy: 50 - 300m
 Ground Level Altitude: 23.7 m +MSD Accuracy: < 2.5 m
 Driller: Clemence Drilling Contractors
 Drill Method: Unknown
 Borelog Depth: 84.7 m Drill Date: 02-May-2015



Scale(m)	Water Level	Depth(m)	Full Drillers Description	Formation Code
		0.15m	TOPSOIL. Not Recorded. Yellow clayey, silty GRAVEL (2 - 60 MM). Not Recorded.	
		2.10m	Grey clayey GRAVEL (2 - 60 MM). Unsaturated (dry or moist).	
5		4.50m	Blue sandy GRAVEL (2 - 60 MM). Not Recorded.	
		5.80m	Yellow clayey GRAVEL (2 - 60 MM). Not Recorded.	
		7.20m	Yellow clayey, silty GRAVEL (2 - 60 MM). Not Recorded.	
		8.00m	sandy GRAVEL (2 - 60 MM). Saturated (water-bearing).	
10		9.50m	clayey GRAVEL (2 - 60 MM) with some sand. Not Recorded.	
		10.60m	Brown sandy GRAVEL (2 - 60 MM). Not Recorded.	
		11.50m	GRAVEL (2 - 60 MM) with some sand. Saturated (water-bearing).	
		12.30m	clayey GRAVEL (2 - 60 MM). Not Recorded.	
		13.20m	GRAVEL (2 - 60 MM). Saturated (water-bearing).	
15		14.40m	clayey GRAVEL (2 - 60 MM). Not Recorded.	
		15.50m	Yellow GRAVEL (2 - 60 MM) with some clay. Saturated (water-bearing).	
		17.20m	clayey GRAVEL (2 - 60 MM). Not Recorded.	
		18.50m	sandy GRAVEL (2 - 60 MM) with some silt. Saturated (water-bearing).	
20		19.40m	clayey GRAVEL (2 - 60 MM). Not Recorded.	
		21.70m	Yellow CLAY with some gravel. Not Recorded.	
25		26.60m	Yellow clayey GRAVEL (2 - 60 MM). Not Recorded.	
		28.20m		





Appendix D: CRC991022 and CRC991827 Irrigation Use Data

CRC991022 and CRC991827 Irrigation Use Records

Consents	Bores	Irrigation Season									
		2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
CRC991022	M35/3064	106,686	72,409	83,018	90,304	113,531	44,998	45,091	105,836	126,559	32,074
	M35/3065	101,547	76,379	39,594	160,317	176,202	82,984	102,165	143,443	62,472	81,285
	Total	208,233	148,788	122,612	250,622	289,732	127,982	147,256	249,279	189,031	113,359
CRC991827	M35/3026	68,835	56,129	49,449	104,174	122,443	13,987	0	0	0	0
	M35/0367	68,403	46,702	63,072	100,995	91,143	41,624	13,953	0	0	0
	Total	137,238	102,831	112,521	205,170	213,586	55,611	13,953	0	0	0
CRC991022+CRC991827	All	345,471	251,619	235,133	455,791	503,318	183,593	161,209	249,279	189,031	113,359

Appendix E: BW24/0262 Water Quality Results

Clemence Drilling
PO Box 191
Kaiapoi
7691

Analytical Report

Report Number: 15/20483
Issue: 1
03 July 2015

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
15/20483-01	Domestic Water Supply		26/06/2015 3:25	27/06/2015 09:00	BW24/0262
Notes: Bradleys Road, Ohoka					
Sample taken at 20 L/S					
Test	Result	Units	Comments	Signatory	
0001 pH	7.8		Passes GV of 7.0 to 8.5	Marylou Cabral KTP	
0002 Suspended Solids - Total	< 3	g/m ³		Marylou Cabral KTP	
0002B Total Sediment Concentration	2	g/m ³		Marylou Cabral KTP	
0052 Alkalinity - Total	93	g CaCO ₃ /m ³	Not a NZDWS test	Marylou Cabral KTP	
0055 Conductivity at 25°C	23.4	mS/m	Not a NZDWS test	Gordon McArthur KTP	
0055B Total Dissolved Solids	128	g/m ³	Below GV of 1000	Alexandra Black KTP	
0073 Bicarbonate	92	g CaCO ₃ /m ³	Not a NZDWS test	Marylou Cabral .	
0074 Carbonate	< 1	g CaCO ₃ /m ³	Not a NZDWS test	Marylou Cabral .	
0076 Free CO ₂	3	g CO ₂ /m ³	Not a NZDWS test	Marylou Cabral .	
0084 Turbidity	3.71	NTU	Above GV of 2.5	Gordon McArthur KTP	
0701 Fluoride	0.069	g/m ³	See Notes Below	Kavita KTP	
0702 Chloride	10.2	g/m ³	Below GV of 250	Kavita KTP	
0704 Bromide	0.034	g/m ³	Not a NZDWS test	Kavita KTP	
0705 Nitrate Nitrogen	0.351	g/m ³	Passes MAV Limit of 11.3	Kavita KTP	
0707 Sulphate	2.84	g/m ³	Below GV of 250	Kavita KTP	
0711 Nitrite-Nitrogen	0.003	g/m ³	Passes MAV Limit of 0.9	Kavita KTP	
0752 Absorbance at 270 nm	0.02			Gordon McArthur KTP	
0755 Absorbance at 254 nm	0.03			Gordon McArthur KTP	
0760 Ammonia Nitrogen	0.02	g/m ³	Below GV of 1.5	Tracy Morrison KTP	
0777 Colour	2.4	TCU		Gordon McArthur KTP	
1003 Aerated pH	8.4			Gordon McArthur KTP	
1610 Calcium - Acid Soluble	20.5	g/m ³	See Total Hardness	Shanel Kumar KTP	
1622 Magnesium - Acid Soluble	7.59	g/m ³	See Total Hardness	Shanel Kumar KTP	
1629 Potassium - Acid Soluble	1.36	g/m ³	Not a NZDWS test	Shanel Kumar KTP	
1634 Sodium - Acid Soluble	17.9	g/m ³	Below GV of 200	Shanel Kumar KTP	
1642 Total Hardness	83	g CaCO ₃ /m ³	Below Moderate Hardness Level of 100	Shanel Kumar KTP	
1643 Silica	19.2	g/m ³		Shanel Kumar KTP	
2088 Dissolved Reactive Phosphorus	0.039	g/m ³		Tracy Morrison KTP	
6003 Arsenic - Acid Soluble	< 0.001	g/m ³	Passes MAV Limit of 0.01	Sharon van Soest KTP	
6007 Boron - Acid Soluble	< 0.03	g/m ³	Passes MAV Limit of 1.4	Sharon van Soest KTP	
6008 Cadmium - Acid Soluble	< 0.0002	g/m ³	Passes MAV Limit of 0.004	Sharon van Soest KTP	
6011 Chromium - Acid Soluble	< 0.001	g/m ³	Passes MAV Limit of 0.05	Sharon van Soest KTP	
6013 Copper - Acid Soluble	< 0.0005	g/m ³	Below GV of 1	Sharon van Soest KTP	
6017 Iron - Acid Soluble	0.08	g/m ³	Below GV of 0.2	Sharon van Soest KTP	
6018 Lead - Acid Soluble	< 0.0005	g/m ³	Passes MAV Limit of 0.01	Sharon van Soest KTP	
6021 Manganese - Acid Soluble	0.0076	g/m ³	Below GV of 0.04	Sharon van Soest KTP	
6024 Nickel - Acid Soluble	< 0.0005	g/m ³	Passes MAV Limit of 0.08	Sharon van Soest KTP	

Sample	Site	Map Ref.	Date Sampled	Date Received	Order No.
15/20483-01	Domestic Water Supply		26/06/2015 3:25	27/06/2015 09:00	BW24/0262
Notes: Bradleys Road, Ohoka Sample taken at 20 L/S					
Test	Result	Units	Comments	Signatory	
6028 Selenium - Acid Soluble	< 0.002	g/m ³	Passes MAV Limit of 0.01	Sharon van Soest KTP	
6038 Zinc - Acid Soluble	0.007	g/m ³	Below GV of 1.5	Sharon van Soest KTP	
M0402 E. coli	<1	/100mL	Complies	Maria Norris KTP	

Comments:

Sampled by customer using ELS approved containers.

Comments on Individual Test Results

pH
pH measures how acidic or basic the water sample is. Waters with low pH can be corrosive and those with a high pH can promote scale formation in pipes and hot water cylinders. The guideline value for pH in the NZ Drinking Water Standards is 7.0 to 8.5 so the pH of this sample complies with this value.

Alkalinity - Total
Alkalinity is a measure of a waters ability to neutralise acid and is not listed in the NZ Drinking Water Standards. It is included here as a general water quality parameter and can be used as part of the Saturation Index calculation.

Conductivity at 25°C
Conductivity is not listed in the NZ Drinking Water Standards and is an indicator of how many ions are dissolved in the water such as chloride, sulphate and iron. The result is used to calculate the Total Dissolved Solids content of a sample.

Total Dissolved Solids
Total Dissolved Solids is calculated from the conductivity result and has a Guideline Value in the NZ Drinking Water Standards of 1,000 g/m3. The result for this sample complies with this limit.

Bicarbonate
Bicarbonate Alkalinity is the portion of alkalinity attributable to bicarbonate ions and is not listed in the NZ Drinking Water Standards. It is included here as a general water quality parameter.

Carbonate
Carbonate Alkalinity is the portion of alkalinity attributable to carbonate ions which is usually the dominant portion of the total alkalinity. It is not listed in the NZ Drinking Water Standards and is included here as a general water quality parameter.

Free CO2
Free CO2 is a measure of the carbon dioxide dissolved in the water and is not listed in the NZ Drinking Water Standards. It is included here because it can cause the water to become acidic leading to the corrosion of pipes and fittings.

Turbidity
Turbidity in water is caused by the presence of fine suspended matter such as clay, silt, and other particles. The result for this sample is above the NZ Drinking Water Standards limit of 2.5 NTU.

Fluoride
Non-fluoridated supplies can have naturally occurring fluoride levels ranging from zero to 0.5 g/m3. The Ministry of Health recommends that the concentration of fluoride in fluoridated drinking-water supplies be between 0.7 and 1.0 g/m3 and lists a Maximum Allowable Value of 1.5 g/m3. The level of fluoride in this sample complies with this limit.

Chloride
Chloride is usually present in water sources as sodium chloride - or salt. The NZ Drinking Water Standards lists a Guideline Value of 250 g/m3, above which the water can taste salty and cause corrosion. The level of chloride in this sample is below the limit.

Bromide
Bromide ions occur naturally in surface water and groundwater and can increase due to saltwater intrusion or pollution. Bromide is introduced into New Zealand surface waters usually by wind blown seaspray. This test is not included in the NZ Drinking Water Standards and is included here because it can form harmful

bromate if the water is treated with ozone.

Nitrate Nitrogen

Nitrate-Nitrogen is introduced to water supplies through fertiliser run-off, the breakdown of organic matter, and from septic tanks and effluent ponds. The NZ Drinking Water Standards lists a Maximum Allowable Value of 11.3 g/m3. The level of nitrate-nitrogen in this sample complies with this limit.

Sulphate

Sulphate is present in some New Zealand soils and can cause taste problems at high levels. The NZ Drinking Water Standards lists a Guideline Value of 250 g/m3, above which the water can taste bad and smell of sulphur. The level of sulphate in this sample is below the limit.

Nitrite-Nitrogen

Nitrite-Nitrogen can enter a water source through the breakdown of animal and plant matter and from faecal contamination. The NZ Drinking Water Standards lists a Maximum Allowable Value of 0.9 g/m3. The level of nitrite-nitrogen in this sample complies with this limit.

Ammonia Nitrogen

Ammonia may be found in natural surface waters, but is more frequently found at elevated concentrations in anaerobic groundwaters. The NZ Drinking Water Standards lists a Guideline Value of 1.5 g/m3 above which the odour may be detected. The level of ammonia in this sample is below the limit.

Potassium - Acid Soluble

Potassium is not listed in the NZ Drinking Water Standards and is included here as a likely indicator of dairy farm contamination.

Sodium - Acid Soluble

Sodium is usually present in water sources as sodium chloride - or salt. The NZ Drinking Water Standards lists a Guideline Value of 200 g/m3, above which the water can taste salty and cause corrosion. The level of sodium in this sample is below the limit.

Total Hardness

Hardness is derived from the calcium and magnesium content of the water and indicates the likelihood of scale formation inside pipes and kettles. The level of hardness in this sample indicates a soft to moderate water.

Arsenic - Acid Soluble

Arsenic is found in some soils around New Zealand and this can lead to elevated arsenic levels in some bore waters. The NZ Drinking Water Standards lists a Maximum Allowable Value of 0.01 g/m3. The level of arsenic in this sample complies with this limit.

Boron - Acid Soluble

Boron is introduced to water supplies through the weathering of rocks or from geothermal processes. The NZ Drinking Water Standards lists a Maximum Acceptable Value of 1.4 g/m3. The level of boron in this sample complies with this limit.

Cadmium - Acid Soluble

Cadmium is found at elevated levels in some industrial and domestic effluents as well as street and industrial run-off. The NZ Drinking Water Standards lists a Maximum Allowable Value of 0.004 g/m3. The level of cadmium in this sample complies with this limit.

Chromium - Acid Soluble

Chromium is present in most New Zealand soils and rocks and can also enter water supplies through some industrial processes. The NZ Drinking Water Standards lists a Maximum Allowable Value of 0.05 g/m3. The level of chromium in this sample complies with this limit.

Copper - Acid Soluble

Copper is introduced to water supplies through the weathering of rocks, from geothermal processes and from copper pipes and can cause a blue stain at elevated levels. The NZ Drinking Water Standards lists a Guideline Value of 1 g/m3 and Maximum Acceptable Value of 2 g/m3. The level of copper in this sample complies with both limits.

Iron - Acid Soluble

Iron is an essential element and is very common in NZ water. The NZ Drinking Water Standards lists a Guideline Value of 0.2 g/m3. The level of iron in this sample is below the limit.

Lead - Acid Soluble

Lead is found naturally in some New Zealand soils however the majority of lead in the environment comes from legacy sources such as paint and petrol. Brass plumbing fittings also contain lead, which is why the Ministry of Health advises consumers to run a mugfull of water to waste each morning before pouring a drink of water. The NZ Drinking Water Standards lists a Maximum Allowable Value of 0.01 g/m3. The level of lead in this sample complies with this limit.

Manganese - Acid Soluble

Manganese is introduced to water supplies through the weathering of rocks and is common in NZ. The NZ Drinking Water Standards lists a Guideline Value of

0.04 g/m³ and a Maximum Allowable Value of 0.4 g/m³. The level of manganese in this sample is below both limits.

Nickel - Acid Soluble

Nickel can be found in New Zealand soils however its main release to the environment is through the burning of fossil fuels. The NZ Drinking Water Standards lists a Maximum Allowable Value of 0.08 g/m³. The level of nickel in this sample complies with this limit.

Selenium - Acid Soluble

Selenium is present in New Zealand soils in low concentrations and is not commonly found in drinking water. The NZ Drinking Water Standards lists a Maximum Allowable Value of 0.01 g/m³. The level of selenium in this sample complies with this limit.

Zinc - Acid Soluble

Zinc is introduced to water supplies through the weathering of rocks and from galvanised pipes. The NZ Drinking Water Standards lists a Guideline Value of 1.5 g/m³. The level of zinc in this sample is below this limit.

Test Methodology:

Test	Methodology	Detection Limit
pH	Dedicated pH meter following APHA 22nd Edition Method 4500 H.	0.1
Suspended Solids - Total	APHA 22nd Edition Method 2540 D	3 g/m ³
Total Sediment Concentration	ASTM D3977-97	1 g/m ³
Alkalinity - Total	APHA 22nd Edition Method 2320 B	1 g CaCO ₃ /m ³
Conductivity at 25°C	APHA 22nd Edition Method 2510 B.	0.1 mS/m
Total Dissolved Solids	Conductivity reading in mS/m x 5.5. The result by this method should be considered approximate only.	1 g/m ³
Bicarbonate	Calculated from alkalinity and pH following APHA 22nd Edition Method 4500-CO ₂ . The sample TDS must be <500 g/m ³ and all alkalinity derived from hydroxides, carbonates or bicarbonates.	1 g CaCO ₃ /m ³
Carbonate	Calculated from alkalinity and pH following APHA 22nd Edition Method 4500-CO ₂ . The sample TDS must be <500 g/m ³ and all alkalinity derived from hydroxides, carbonates or bicarbonates.	1 g CaCO ₃ /m ³
Free CO ₂	Calculated from alkalinity and pH following APHA 22nd Edition Method 4500-CO ₂ . The sample TDS must be <500 g/m ³ and all alkalinity derived from hydroxides, carbonates or bicarbonates.	1 g CO ₂ /m ³
Turbidity	Turbidity Meter following APHA 22nd Edition Method 2130 B.	0.01 NTU
Fluoride	Ion Chromatography following USEPA 300.0 (modified)	0.005 g/m ³
Chloride	Ion Chromatography following USEPA 300.0 (modified)	0.005 g/m ³
Bromide	Ion Chromatography following USEPA 300.0 (modified)	0.005 g/m ³
Nitrate Nitrogen	Ion Chromatography following USEPA 300.0 (modified)	0.002 g/m ³
Sulphate	Ion Chromatography following USEPA 300.0 (modified)	0.005 g/m ³
Nitrite-Nitrogen	Ion Chromatography following USEPA 300.0 (modified)	0.002 g/m ³
Absorbance at 270 nm	In house method.	0.01
Absorbance at 254 nm	In house method	0.01
Ammonia Nitrogen	Flow Injection Autoanalyser following APHA 22nd Edition Method 4500 NH ₃ -H.	0.01 g/m ³
Colour	Calculated from Absorbance @ 270nm.	0.1 TCU
Aerated pH	APHA 22nd Edition Method 4500 H	0.1
Calcium - Acid Soluble	ICP-OES following APHA 22nd Edition Method 3120 B (modified).	0.05 g/m ³
Magnesium - Acid Soluble	ICP-OES following APHA 22nd Edition Method 3120 B (modified).	0.01 g/m ³
Potassium - Acid Soluble	ICP-OES following APHA 22nd Edition Method 3120 B (modified).	0.05 g/m ³
Sodium - Acid Soluble	ICP-OES following APHA 22nd Edition Method 3120 B (modified).	0.05 g/m ³
Total Hardness	ICP-OES following APHA 22nd Edition Method 3120 B (modified).	1 g CaCO ₃ /m ³
Silica	ICP-OES following APHA 22nd Edition Method 3120 B (modified)	0.02 g/m ³
Dissolved Reactive Phosphorus	Flow Injection Autoanalyser following APHA 22nd Edition Method 4500-P G.	0.005 g/m ³
Arsenic - Acid Soluble	ICP-MS following APHA 22nd edition method 3125 (modified).	0.001 g/m ³
Boron - Acid Soluble	ICP-MS following APHA 22nd edition method 3125 (modified).	0.03 g/m ³
Cadmium - Acid Soluble	ICP-MS following APHA 22nd edition method 3125 (modified).	0.0002 g/m ³
Chromium - Acid Soluble	ICP-MS following APHA 22nd edition method 3125 (modified).	0.001 g/m ³
Copper - Acid Soluble	ICP-MS following APHA 22nd edition method 3125 (modified).	0.0005 g/m ³

Test	Methodology	Detection Limit
Iron - Acid Soluble	ICP-MS following APHA 22nd edition method 3125 (modified).	0.01 g/m ³
Lead - Acid Soluble	ICP-MS following APHA 22nd edition method 3125 (modified).	0.0005 g/m ³
Manganese - Acid Soluble	ICP-MS following APHA 22nd edition method 3125 (modified).	0.0005 g/m ³
Nickel - Acid Soluble	ICP-MS following APHA 22nd edition method 3125 (modified).	0.0005 g/m ³
Selenium - Acid Soluble	ICP-MS following APHA 22nd edition method 3125 (modified).	0.002 g/m ³
Zinc - Acid Soluble	ICP-MS following APHA 22nd edition method 3125 (modified).	0.002 g/m ³
E. coli	APHA 22nd Edition, 9223B:2012.	1 /100mL

"<" means that no analyte was found in the sample at the level of detection shown. Detection limits are based on a clean matrix and may vary according to individual sample.

g/m³ is the equivalent to mg/L and ppm.

Samples will be retained for a period of time, in suitable conditions appropriate to the analyses requested.

All test methods and confidence limits are available on request. This report must not be reproduced except in full, without the written consent of the laboratory.



Report Released By
Rob Deacon



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IRRIGATION REASONABLE USE DATABASE

5 STEPS - TO GET THE IRRIGATION REQUIREMENTS INFORMATION YOU NEED FOR IRRIGATION PLANNING, CONSENTING AND DESIGN



1

Enter the address or coordinates (latitude, longitude) of your farm and click 'Locate' or click on the map

-43.369 , 172.566

Locate



2

Select Crop

Pasture

3

Select Plant Available Water

(b) User specified PAW's

4

Select Irrigation Method

80% Efficient Irrigator

5

Fetch Data

Farm Details		Plant Available Water Details		Irrigation Requirements	
Description		PAW(mm)	Indicative Likelihood	Area (hectares)	
Latitude	-43.369	120	0	4.8	System Capacity
Longitude	172.566	PAW		0	System Capacity
Council	Canterbury	PAW		0	Daily Volume
Climate Site ID	P132085	PAW		0	7 Day Volume
Distance to Climate Site (km)	0.99	PAW		0	28 Day Volume
Rainfall (mm)	639		Total area =	4.8	90% ile Annual Volume
					Per Hectare
					Total Area
					0.61 (l/s/ha)
					2.93 (l/s)
					5.3 (mm/day)
					53 (m³/ha)
					254 (m³)
					(m³)
					(m³)
					(m³)
					7,560 (m³/ha)
					36,288 (m³)

These estimates of irrigation requirements are based on the assumption that the crop you selected can be grown and irrigated at the site you have selected. Constraints such as topography and crop-specific climate requirements are not taken into account.

Irrigation requirements may be less than reported here if your soils are poorly drained or the water table is close to the soil surface.

Detailed Results

Save this Page

User Guide

Dewatering (Long narrow trench - Unconfined groundwater - No mitigation)

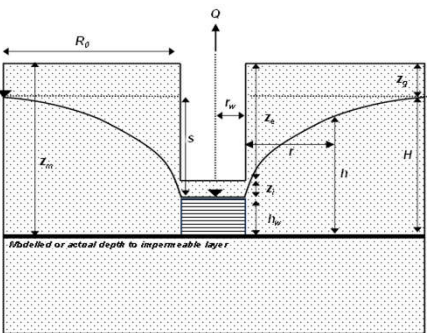
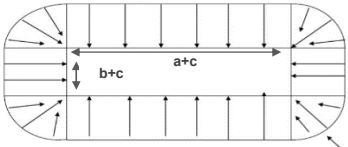
Generic Model Inputs

Static water table depth below ground	z_g	0.05	m
Excavation depth below ground	z_e	0.35	m
Target dewatering (water table) depth below ground	z_i	0	m
Pumped water table depth below base of excavation footprint	h_w	0	m
Thickness of groundwater intake (i.e. well screen)	z_m	0.35	m
Modelled impermeable layer depth below ground	H	0.3	m
Groundwater head above impermeable layer at R_0	s	0.3	m
Drawdown from static water level within excavation footprint	K	30	m/d
Mean hydraulic conductivity	S	0.1	-
Maximum order of magnitude change in hydraulic conductivity	t	30	d
Storage coefficient (use specific yield)	r	1	-
Duration of dewatering (maximum modelled = 30 days)	a	13400.0	m
Distance from edge of excavation or dewatering bores	b	0.8	m
Excavation length	c	0.0	m
Excavation width	a/b or b/a	16750.0	-
Dewatering bore / well point spacing from excavation	-	Yes	-
Length / width ratio (Rule 1)	-	0.40	m
Okay to use model?	r_{w-calc}		
Bore radius for calculation of flow to corners (Equation 4)			

z_g must be $< z_m$ Okay

Default: 0.5 m
Default: Sump pump = 0.5 m, wells = 2 m
 $z_m = z_e + z_i + h_w$. Must be $\geq$ actual depth to impermeable layer
 $H = z_m - z_g$
 $H - h$

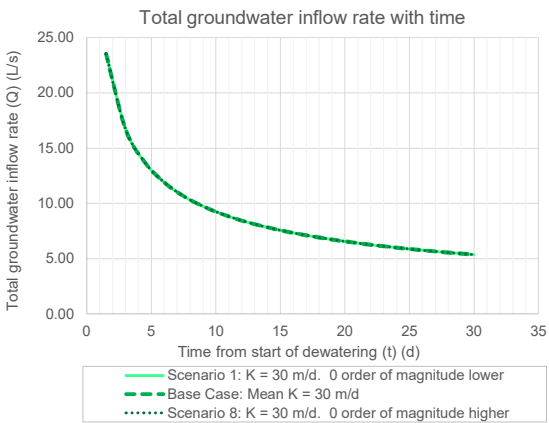
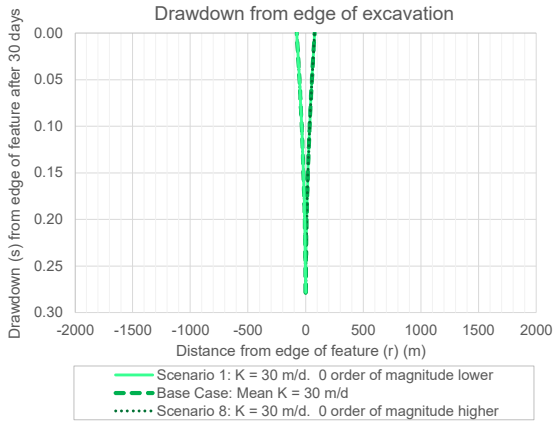
Default: 0.1



Notes

z_g	Consider sensitivity analysis based on lowest and highest groundwater level. Highest ground water level gives largest inflow.
z_i	Default value of 0.5 m to allow for a dry excavation.
h_w	Default values of zero for sump pumping or 2 m for the well screen interval. Option to add actual well screen interval if known.
H	Modelled or actual vertical distance to impermeable boundary at radius of influence (point of zero drawdown).
K	Input mean value then do sensitivity analysis. Check against field test and literature values to ensure values are within a realistic range based on material descriptions.
T	Check against aquifer test or reported values if available. T calculated in spreadsheet may be less than tested or reported if H does not reach actual impermeable layer.
S	Use specific yield. Check with field testing and literature values to ensure these are within a realistic range based on material descriptions.

Scenario	Order of magnitude change from mean hydraulic conductivity (K)	Hydraulic conductivity (K) (m/d)	Hydraulic conductivity (K) (m/s)	Transmissivity (T) (m ² /d)	Radius of influence (R ₀ = L ₀) from edge of excavation or dewatering bores after 30 day(s) (m)	Total groundwater inflow rate (Q) after 30 day(s) (L/s)	Drawdown (s) at distance (r) from edge of excavation or dewatering bores after 30 days (m)
	-	-	-	KH	Equation 5	Equation 3	-
1	0.00	30.0	3.E-04	9.0	78	5.36	0.28
2	0.00	30.0	3.E-04	9.0	78	5.36	0.28
3	0.00	30.0	3.E-04	9.0	78	5.36	0.28
4	0.00	30.0	3.E-04	9.0	78	5.36	0.28
Base Case	Mean	30.0	3.E-04	9.0	78	5.36	0.28
5	0.00	30.0	3.E-04	9.0	78	5.36	0.28
6	0.00	30.0	3.E-04	9.0	78	5.36	0.28
7	0.00	30.0	3.E-04	9.0	78	5.36	0.28
8	0.00	30.0	3.E-04	9.0	78	5.36	0.28



Dewatering (Long narrow trench - Unconfined groundwater - No mitigation)

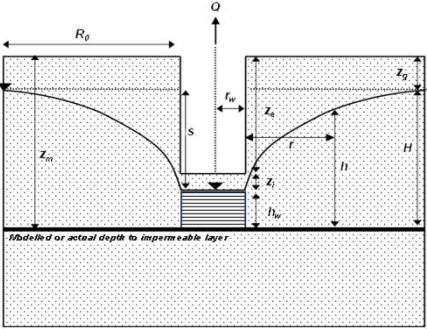
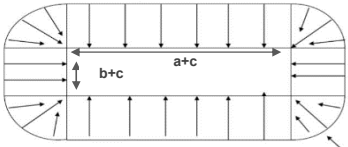
Generic Model Inputs

Static water table depth below ground	z_g	0.05	m
Excavation depth below ground	z_e	0.35	m
Target dewatering (water table) depth below ground	z_i	0.35	m
Pumped water table depth below base of excavation footprint	z_i	0	m
Thickness of groundwater intake (i.e. well screen)	h_w	0	m
Modelled impermeable layer depth below ground	z_m	0.35	m
Groundwater head above impermeable layer at R_0	H	0.3	m
Drawdown from static water level within excavation footprint	s	0.3	m
Mean hydraulic conductivity	K	5	m/d
Maximum order of magnitude change in hydraulic conductivity	S	0	-
Storage coefficient (use specific yield)	S	0.1	-
Duration of dewatering (maximum modelled = 30 days)	t	30	d
Distance from edge of excavation or dewatering bores	r	1	m
Excavation length	a	14800.0	m
Excavation width	b	0.8	m
Dewatering bore / well point spacing from excavation	c	0.0	m
Length / width ratio (Rule 1)	a/b or b/a	18500.0	-
Okay to use model?	-	Yes	-
Bore radius for calculation of flow to corners (Equation 4)	r_{w-calc}	0.40	m

z_g must be $< z_m$ Okay

Default: 0.5 m
Default: Sump pump = 0.5 m, wells = 2 m
 $z_m = z_e + z_i + h_w$. Must be $\geq$ actual depth to impermeable layer
 $H = z_m - z_g$
 $H - h$

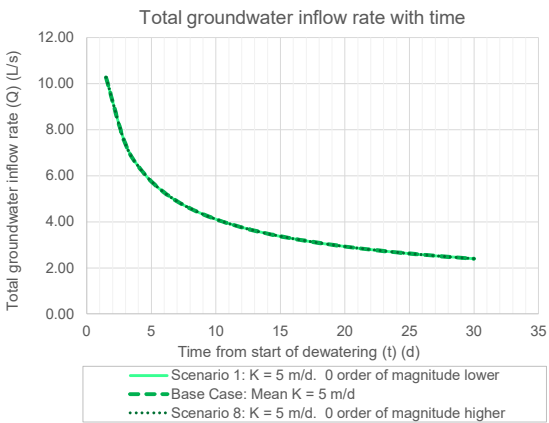
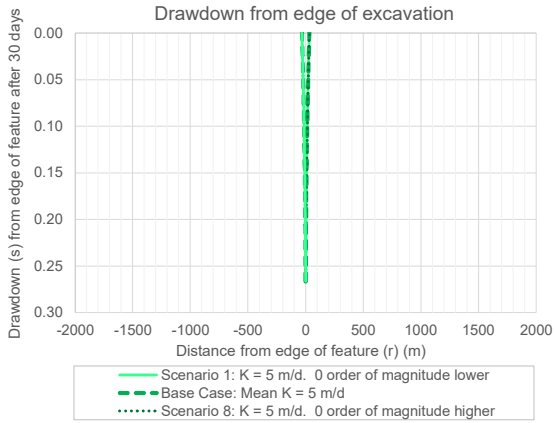
Default: 0.1



Notes

z_g	Consider sensitivity analysis based on lowest and highest groundwater level. Highest ground water level gives largest inflow.
z_i	Default value of 0.5 m to allow for a dry excavation.
h_w	Default values of zero for sump pumping or 2 m for the well screen interval. Option to add actual well screen interval if known.
H	Modelled or actual vertical distance to impermeable boundary at radius of influence (point of zero drawdown).
K	Input mean value then do sensitivity analysis. Check against field test and literature values to ensure values are within a realistic range based on material descriptions.
T	Check against aquifer test or reported values if available. T calculated in spreadsheet may be less than tested or reported if H does not reach actual impermeable layer.
S	Use specific yield. Check with field testing and literature values to ensure these are within a realistic range based on material descriptions.

Scenario	Order of magnitude change from mean hydraulic conductivity (K)	Hydraulic conductivity (K) (m/d)	Hydraulic conductivity (K) (m/s)	Transmissivity (T) (m ² /d)	Radius of influence (R ₀ = L ₀) from edge of excavation or dewatering bores after 30 day(s) (m)	Total groundwater inflow rate (Q) after 30 day(s) (L/s)	Drawdown (s) at distance (r) from edge of excavation or dewatering bores after 30 days (m)
	-	-	-	KH	Equation 5	Equation 3	-
1	0.00	5.0	6.E-05	1.5	32	2.40	0.25
2	0.00	5.0	6.E-05	1.5	32	2.40	0.25
3	0.00	5.0	6.E-05	1.5	32	2.40	0.25
4	0.00	5.0	6.E-05	1.5	32	2.40	0.25
Base Case	Mean	5.0	6.E-05	1.5	32	2.40	0.25
5	0.00	5.0	6.E-05	1.5	32	2.40	0.25
6	0.00	5.0	6.E-05	1.5	32	2.40	0.25
7	0.00	5.0	6.E-05	1.5	32	2.40	0.25
8	0.00	5.0	6.E-05	1.5	32	2.40	0.25



WATER SUPPLY STRATEGY

Mill Road, Ōhoka – Fast Track Application

Carter Group Limited



EXECUTIVE SUMMARY

This document sets out how the proposed community water supply for the Ōhoka Fast-Track Application complies with the information requirements of Schedule 25 of the Canterbury Land and Water Regional Plan (LWRP). This includes descriptions of the proposed water supply system, an assessment of existing and future demand, conservation methods and measures including performance targets, an assessment of alternative water sources and a Drought Management Plan.

It is concluded that the proposed community supply can service the proposed development, provided that the recommendations of this document are followed. This document should be read in conjunction with the report by Pattle Delamore Partners (PDP) titled Fast Track Application – 535 Mill Road, Ohoka – Water Supply Assessment of Environmental Effects.

There are no adverse impacts that reach the threshold of a “sufficiently significant adverse impact” such that they need to be taken into account in terms of an assessment under s 85 of the FTAA2024.

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Reference Materials

Watermain Plan Set, Rev. A by Inovo (Drawing No 16013-00-RC-6000-6007)

Fast Track Application – 535 Mill Road, Ohoka – Water Supply Assessment of
Environmental Effects by Pattle Delamore Partners Ltd (Job Reference: C045180002)

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Anderson Lloyd

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Novo Group Ltd

QUALITY ASSURANCE

PREPARED BY	Sanna Soederlind (CPEng)	Senior Engineer Project Lead	25/05/2026	
REVIEWED BY	Michael Paterson	Director	25/05/2026	

VERSION HISTORY

	Draft for Coordination	V0	19/02/2025
	Draft for Coordination	V1	15/06/2025
	Draft for Coordination	V2	12/08/2025
	Draft for Coordination	V3	16/04/2026
	Final	V4	25/05/2026

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1 INTRODUCTION

1.1 Purpose

Inovo Projects Ltd has been engaged by Carter Group Ltd to prepare a Water Supply Strategy (WSS) in support of an application for a residential subdivision to the Environmental Protection Agency (EPA) under the Fast-track Approvals Act 2024.

This document has been prepared in accordance with Schedule 25 of the Canterbury Land and Water Regional Plan (LWRP), including details around restrictions to the use of water from the proposed community water supply during periods of low flow. This document is part of the 'Water Supply Assessment of Environmental Effects' report prepared by Pattle Delamore Partners Limited (PDP).

1.2 Schedule 25 of the Canterbury Land and Water Regional Plan (LWRP)

An abstract of Schedule 25 of the Canterbury Land and Water Regional Plan (LWRP) is in Appendix A. The key themes required to be addressed in the Water Supply Strategy are and the relevant sections of this report are listed below:

1. A description of the community water supply system (refer Section 2)
2. An assessment of existing and future demand for water (refer Section 3)
3. A description of conservation methods and measures (refer Section 4)
4. An assessment of alternative water sources (refer Section 2)
5. Drought Management Plan (refer Section 5)

1.3 Subject Site Location

The subject site is located to the southwest of the Ōhoka township and consists of approximately 154.4Ha of land. The site is bordered by Bradleys Road, Mill Road and Whites Road.



1.4 Proposed Subdivision

It is proposed to subdivide the subject site. The proposal includes approximately 875 residential lots, a commercial centre adjacent to the Ōhoka Domain, a retirement village, and grounds for a Polo Field next to Bradleys Road. The works are proposed to be carried out in up to 11 Stages and it is expected that construction for all subdivision stages will be complete in or around 2035.

It is proposed to construct a communal water supply to service the full extent of the subdivision.

1.5 Review and Update of the Water Supply Strategy

It is recommended that the WSS is updated after the construction of the Community Water Supply, once all associated bores and their distribution networks have been constructed and commissioned.

The Waimakariri District Council (WDC) Water Conservation Strategy (WCS) stipulates that said document should be reviewed and updated every three years in line with the Long Term Plan (LTP) planning period. It is recommended that this WSS is integrated with that process.

The WDC reviews their budget annually through the Annual Plan and Long Term Plan processes, and it is recommended that this Water Supply Strategy should be reviewed in conjunction with these processes. Additional times when it may be suitable to consider reviewing or updating the WSS is when the 3 Waters Rating Review is carried out, when changes are made to the Water Supply Bylaw, or when decisions are made which may affect water conservation and/or drought management strategies.

The Activity Management Plan 2024 Water Supply District Overview including any future updates should also be considered when reviewing this WSS.

2 PROPOSED COMMUNITY SUPPLY

2.1 Location of Groundwater Abstraction Points

The proposed groundwater abstraction points will be in the form of deep (> 60m below ground level) bores, located within the subject site. The number of bores required is subject to testing, however it is expected that four or five bores will be required to service the development. The plan in Appendix B illustrates 100m set-backs from the external boundaries and indicative locations for groundwater abstraction within the site.

2.2 Conveyance Method

Pumps will be installed with each bore, located within their respective utility reserve area, from which a pressurised pipe will convey water to the community water supply treatment facility. From the treatment facility and associated storage tanks, water will be distributed to the water supply network throughout the development. The network will be pressurised using pumps centrally located at the treatment facility.

Proposed materials will be in accordance with the WDC Engineering Code of Practice (WDC ECOP). It is noted that Table 13 in the WDC Activity Management Plan (AMP) 2024 states the adopted reticulation asset life span for PVC and PE installed post-1990 is 100 years, which is considered suitable for the proposed network.

2.3 Water Supply Distribution Network

The proposed Water Supply Distribution Network is illustrated in the Watermain Plans, Rev A by Inovo (Drawing No 16013-00-RC-6000-6007) and it may be connected to the existing water supply network in Ōhoka.

2.4 Water Treatment Methods

The proposed water treatment for the community water supply is chlorination and UV disinfection. This aligns with the existing and proposed upgrades to the treatment of the existing Ōhoka Water Supply as outlined in the AMP. Some water quality testing has been undertaken onsite, which is outlined in the report by PDP titled Fast Track Application – 535 Mill Road, Ohoka – Water Supply Assessment of Environmental Effects, however further testing will be required once the bores onsite have been drilled.

2.5 Alternative Sources

Alternative water sources have been considered and discounted for the reasons outlined below.

2.5.1 Surface Water

There are no surface water bodies which could be used as alternative sources of water, due to the sensitive nature of the environments around the site. The report by Instream Fast Track Application - 531 & 535 Mill Road - Aquatic Ecology Assessment includes information regarding the importance of baseflow through the existing waterways for gravel beds to provide breeding grounds for fish.

A deep groundwater supply is likely to provide better water quality.

2.5.2 Existing Ōhoka Water Supply

The report by PDP titled Fast Track Application – 535 Mill Road, Ohoka – Water Supply Assessment of Environmental Effects states that there is capacity to service Stage 1 of the development including residential and commercial areas, however there is not sufficient capacity to service the remainder of the development.

2.5.3 Existing Private Water Supply Bores

According to the report by PDP titled Fast Track Application – 535 Mill Road, Ohoka – Water Supply Assessment of Environmental Effects, there are five (although one was not drilled) existing shallow bores located on the site which are authorised to take groundwater for irrigation purposes. The known depths of the bores that were drilled are: 9.4m, 12m and 12.5m below ground level. Due to the shallow nature of these bores, they are not considered suitable to provide drinking water to the site due to the increased risk of those bores being impacted by surface contaminants.

3 ASSESSMENT OF EXISTING AND FUTURE DEMAND

Ōhoka township and surrounding areas are currently supplied by reticulated water supply owned and operated by WDC. According to the WDC Activity Management Plan 2024, the existing network has approximately 124 connections and is sourced from two bores. The principal bore used is identified as Ōhoka Well No. 2 (BW24/0262). A second, shallower bore (Environment Canterbury bore number M35/5609) is used as backup emergency supply. The AMP 2024 projects that the existing Ōhoka Scheme will have an additional 307 connections (12.3 L/s projected peak daily flow) by 2073. The projected upgrade for the Ōhoka Scheme is 12.5 L/s in 2061, including increased storage volumes of 30 m³ in 2033 and 200 m³ in 2070.

As noted above, the existing Ōhoka supply does not have capacity to provide the demand for the new development.

3.1 Existing Demand

A farm is currently operating on the majority of the subject site. The five (four drilled) existing shallow irrigation bores within the property have been consented for groundwater abstraction of up to 60 L/s under consent CRC991022 and 45.6 L/s under consent CRC991827. These bores will be decommissioned and the respective consents surrendered. Abstraction limits are shown in Table 1.

Table 1: Consented Abstraction Limits

Consent	Abstraction Limit (L/s)
CRC991022	60
CRC991827	45.6
Total	105.6

3.2 Estimated Demand for Proposed Development

Tables 2 and 3 below show the Estimated Average and Peak Water Supply Demands and Polo field irrigation demand in Tables 4, 5 and 6 overleaf are demands for the Polo field, Stormwater Management Areas and a summary. These numbers are taken from the report titled Fast Track Application – 535 Mill Road, Ohoka – Water Supply Assessment of Environmental Effects by PDP.

Table 2: Estimated Residential Average Water Supply Demand

Residential Lots / Units		Average Demand per Connection		Average Demand
		L / day	m ³ / day	m ³ / day
Small Lots	752	1,000	1.00	752
Large Lots	123	1,165	1.17	143
Retirement Village	250	250	0.25	63
Total	1,126	2,415	2.42	958
Total Average Demand (+15% allowance) (m³ / day)				1,102

Table 3: Estimated Residential Peak Water Supply Demand

Residential Lots / Units		Peak Demand per Connection		Peak Demand
		L / day	m ³ / day	m ³ / day
Small Lots	752	2,500	2.50	1,880
Large Lots	123	3,810	3.81	469
Retirement Village	250	500	0.50	125
Total	1,126	6,810	6.81	2,474

Table 4: Estimated Irrigation Demand for the Polo Field

Polo Field Irrigation	Adopted Profile Available Water (PAW)	Daily Volume	Annual Volume
Ha		m ³ / day	m ³
4.8	120	254	36,288

Table 5: Estimated Irrigation Demand for Stormwater Management Areas

Irrigation Area	Daily Application Depth	No. of days per year	Daily Volume	Annual Volume
Ha	mm		m ³ / day	m ³
7.2	5	60	360	21,600

Table 6: Estimated Total Water Supply Peak Demand

Total Water Supply Demand	Peak Demand
	m ³ / day
Residential	2,474
Commercial	86
Polo Field Irrigation	254
SMA Area Irrigation	360
Total	3,174

As discussed in the report titled Fast Track Application – 535 Mill Road, Ohoka – Water Supply Assessment of Environmental Effects by PDP, WDC has indicated that N + 1 redundancy would be suitable for a proposed water supply of this size, which means that the water supply must be able to meet peak network demand with one bore offline. Based on the data available, it is expected the proposed development can be serviced by four or five new bores (three or four plus the one for redundancy), assuming performance similar to BW24/0262. Exact yields can be confirmed once testing of any new bores is carried out.

3.3 Staging

It is proposed that the subdivision will be constructed in up to eleven stages. The proposed four or five bores (subject to capacity testing) will be constructed sequentially from the north-north-eastern portion of the site next to Mill Road, to the southern side ahead of each stage(s) served. The exact ratio of stages and lots to each bore will be determined following confirmation of the bore locations. It is likely that the treatment facility will be located at or near the first bore to be established towards the northern end of the site.

3.4 Future Demand

The densities proposed for the Ōhoka development are higher than that of the surrounding environments. It is therefore not anticipated that further intensification will be proposed within the subject site beyond what can be accounted for in the conservative estimates above. Therefore, it is considered suitable to assume these estimates to be in line with capacities reflective of the maximum probable development (MPD).

Existing supply bore BW24/0262 provides additional supply to exceed the N+1 redundancy requirements through to 2073, as outlined in the report by PDP titled Fast Track Application – 535 Mill Road, Ohoka – Water Supply Assessment of Environmental Effects.

Any increased demand outside of the subject site would be accommodated by the existing public reticulation associated with the Mandeville and/or Ōhoka Schemes.

The Activity Management Plan (AMP) 2024 Water Supply District Overview by the Waimakariri District Council discusses growth projections for the various towns within the district and the necessary works have been incorporated into the capital project budgets.

Should any changes be proposed to increase the density of the land served by this water supply system, the demand will need to be assessed to ensure that any proposed additional demand can be accounted for by upgrades and/or additions to the community supply system.

3.5 Public Health Needs

3.5.1 Drinking (Potable) Water

Safe drinking water is a necessity for good health. As per the Water Service Act 2021, Te Whatu Ora is the drinking water regulator as of 15 November 2021 and following that, Taumata Arowai published new Drinking Water Standards which came into effect on 14 November 2022. Public health needs are safeguarded through the Drinking Water Quality Assurance Rules which set out how drinking water suppliers must comply with key parts of the Drinking Water Standards and the Water Services Act 2021. The Drinking Water Standards include limits for a range of health factors relating to safety and quality of drinking water and are based on those set by the World Health Organization (WHO).

3.5.2 Firefighting

The New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ PAS 4509:2008) stipulates the minimum supply of water pressure and volume for firefighting in urban areas. The requirements can be used to provide advice for similar systems outside fire districts, such as rural areas. SNZ PAS 4509:2008 does however state that the effectiveness of a water supply for firefighting in rural areas will be affected by aspects including the time and distance from a fire station and seasonal sustainability of the water supply.

Any proposed building will need to comply with fire fighting requirements and will be assessed at Building Consent Stage for each individual project and will be the responsibility of the property owner.

3.6 Responsibilities of Municipal Water Supply Authorities

The Local Government Act (LGA) 2002 addresses specific obligations to ensure that communities have access to safe drinking water to the point of supply of each dwelling. The responsibility of WDC as the Municipal Water Supply Authority, once the water supply assets have been vested and the maintenance liability period has ended, shall be as per the obligations outlined in the LGA, the Water Service Act 2021 and as outlined in the Waimakariri Water Supply Bylaw 2018 and any subsequent versions superseding it.

At a regional level, the Canterbury Water Management Strategy (CWMS) – Strategic Framework by the Canterbury Mayoral Forum (Nov 2009, Targets updated Jul 2010, Interim Targets for 2025 and 2030 added Aug 2019) references R19/122 E19/7624 outlines that Canterbury's water resources have been coming under pressure and that aquifer allocation limits are exceeded in some areas. The document further states that some substantial water use efficiency gains can be made both by existing and new users. The identified target for 2040 relating to community water supply is:

Reduced water used for community water supply by 20% (measured in litres per person per day) compared to that used in 2010.

This Water Supply Strategy is intended to align with the CWMS and it is the responsibility of the Municipal Water Supply Authority to continue to work with the other regulatory bodies to implement these strategies. To achieve this target, two proposed methods that have been given are 'Community water supply strategies and asset management plans' and 'educational initiatives'.

4 WATER CONSERVATION STRATEGY

According to the Water Conservation Strategy, 2010 (revised September 2020) by the WDC the principal drivers identified for conserving water are:

- Environmental – minimising water use reduces the impacts on the environment
- Financial – reduced water use results in lower costs to build and operate water supplies
- Regulatory – resource consent holders are required to use water efficiently
- Cultural – water conservation promotes cultural wellbeing

The water conservation strategy for the subdivision is proposed to include measures that align with the principles outlined above.

4.1 Water Efficiency and Conservation Measures

4.1.1 The Waimakariri District Council Water Conservation Strategy

The Waimakariri District Council Water Conservation Strategy and the AMP 2024 include three primary initiatives and additional other initiatives:

Primary Measures:

- Community Awareness Programme, including media campaigns and school education programmes
- Leak Reduction, including monitoring and budgeting for works to reduce leaks
- Water Metering Investigations, including monitoring installed flowmeters

Other Measures:

- Water Restrictions during critical times
- Restrictor Checks to ensure that excessive wear or damage has not occurred
- Water Efficient Technologies
- Investigations into Alternative Sources of Non-Potable Water including rain water collection and grey water reuse for garden water use (not currently actively programmed in by WCS)

Measures that WDC have identified as not to be adopted include a universal water metering programme due to the estimated cost not being an acceptable solution for the ratepayers.

The rating method for the existing Water Supply Scheme for Ōhoka is Fixed Charge, however there are Variable Charge schemes in other areas of the Waimakariri District.

4.1.2 Proposed Water Conservation Strategy for the Proposed Community Water Supply

Proposed Measures for the subdivision include:

- Signage to aid community awareness
- School Education and other public awareness programmes already implemented by the WDC
- Maintenance of the Reticulation Network to reduce loss to leakage
- Water Restrictions during critical times

The WDC WCS states that 3 Waters rating will continue to be reviewed as part of the Long Term Plan Process.

Other optional measures which could be implemented in the future include:

- Water meters for extraordinary users, which may include the commercial activities, retirement village and polo field sports facility
- Variable charge rating
- Water Meter Monitoring for leak detection using smart water meters with remote water metering
- Water efficient technologies such as tap aerators and/or half flush toilets for proposed dwellings

4.2 Reduction of Water Loss from Reticulated Network

Material selection for the proposed reticulated network will be in accordance with the Engineering CoP and therefore is anticipated to align with the expectations of the wider network performance over time. Regular maintenance will be required and should be budgeted for.

During the investigation undertaken by the WDC as assessed 30 Jun 2019 outlined in the WCS, the existing Ōhoka scheme fell into the (A) band for leakage management, where further loss reduction may be uneconomic unless there are shortages. On this basis, it appears that the existing reticulation in Ōhoka is performing reasonably well as compared to for example the Mandeville network which was the worst performing network identified in 2019. Therefore, it is proposed that a network similar to the existing Ōhoka water supply should be constructed for the new subdivision.

Leakage reduction works identified through night flow analysis is in line with WDC’s existing practices and is therefore a recommended strategy. Any active leak detection resulting from the night flow analysis include:

- Step testing
- Acoustic logging
- Temporary metering
- Leak correlation, pinpointing and repair

It is also recommended that abstraction rates are monitored in relation to the night flow analysis, similar to what is discussed in the Water Conservation and Demand Management Plan by Selwyn District Council, dated September 2023 using SCADA, to integrate with Council’s existing systems.

At detailed design, the proposed network and pumpstation(s) shall be designed to allow for the lowest pressure that is suitable for the demand required for potable supply and firefighting purposes, to reduce risk and magnitude of leakage and mains bursts. This may also extend the life of the proposed infrastructure. It may also be considered at detail design stage, whether pressure reductions could be implemented during times of lower demand, such as overnight.

The target level of service for WDC on demand schemes is to provide greater than 300kPa for 95% of the time and greater than 250 kPa 100% of the time according to the WDC WCS 2010.

4.3 Performance Targets

The WDC WCS includes both mandatory and non-mandatory targets, which will be adopted for the proposed Community Water Supply, to maintain consistency across the WDC assets and water supply schemes.

4.3.1 Mandatory Targets

Performance targets for the proposed Water Supply are in accordance with the WDC WCS. Table 7 below is for a mandatory performance measure related to leakage.

Table 7: Mandatory Performance Target

Level of Service	Performance Measure	2021 Target
Maintenance of the Reticulation Network All public supplies are actively maintained to minimise the loss of water leakage	The percentage of real water loss from the networked reticulation system	Less than 22%

4.3.2 Non-mandatory Targets

Four non-mandatory performance measures were also identified as outlined in the WDC WCS, as per Table 8 below.

Table 8: Non-mandatory Performance Targets

Level of Service	Performance Measure (2021)	Target
Losses	Water losses as determined by the Infrastructure Leakage Index (ILI) based on an annual assessment	<u>Scheme Level:</u> ILI >= "B" or an economic assessment carried out and recommended measured implemented <u>District level:</u> ILI >= "B"
Water Usage	Actual usage on average day	Maintain the average daily water use below 100% of the assessed reasonable water use
Water Usage	Actual usage on peak day	Reduce the peak daily usage to below 110% of the assessed reasonable water use
Flow – Allocated Units	Percentage of properties where flow received is consistent with allocated units at the point of supply in restricted or semi-restricted schemes as demonstrated by restrictor checks completed.	100% of restrictors tested at no more than 5 yearly intervals.

4.3.3 Measuring and Reporting on Targets

Table 9 below is what is referred to as Table 26 in the WDC WCS 2010 for measuring and reporting on success of the WCS. As the proposed Water Supply System will be vested to WDC, the same performance targets and reporting is proposed for the purpose of this Water Supply Strategy.

Table 9: Measuring and Reporting Targets (Table 26 in the WDC WCS 2010)

Initiative	Measure	Frequency / Method of Assessment	Reporting
Metering of extra-ordinary users	Data is collected quarterly on selected sample properties where meters have been installed.	Two assessments of this data have been carried out to date. This data will be utilised again if required, to help inform any future policy decisions / changes.	This will be reported as part of the wider consideration into 3 Waters rating, if opted for following consultation as part of the 2021-31 Long Term Plan
Community Awareness Programme	Number of classroom hours / students engaged with to be reported on as part of school education programme. General report on progress for other elements.	A summary of activities undertaken as part of this initiative will be collated annually. May include water audits, or education regarding water efficient devices.	To be included within annual report to Council's Utilities and Rooding Committee.
Leak Reduction	Infrastructure Leakage Index (ILI)	Annual calculation based on minimum night flows, comparison with level of service for this measure.	Annual report to Council's Utilities and Rooding Committee. Included within water supply Activity Management Plans. Percentage is reported to the Department of Internal Affairs as part of the mandatory performance measure reporting.
	Percentage of total water Used	Annual calculation based on minimum night flows, comparison with level of service.	
	L / conn. / day	Annual calculation on each scheme based on minimum night flows.	Included within annual report to Council's Utilities and Rooding Committee.
	m3 / km / day		
Restrictor Checks	Percentage of properties where flow received is consistent with allocated units at the point of supply in restricted or semi-restricted schemes as demonstrated by restrictor checks completed. 100% of restrictors to be checked at no more than 5-yearly interval.	The Asset Management Information System (AMIS) project Phase 2 is required to be completed to allow this to be reported on. When completed test dates will be stored against each restrictor asset, and a query run to determine the percentage tested within the last 5 year interval.	This is included within performance level reporting, within each relevant scheme Activity Management Plan on a three yearly basis.
Pressure Management	N/A	N/A	The use of pressure management to reduce night flows while still ensuring adequate pressures are able to be achieved during high demand times will be trialled initially on Kaiapoi or Rangiora in the 2020/21 financial year, and the results of this reported back to the Utilities and Rooding Committee as part of the annual WCS implementation report.

5 DROUGHT MANAGEMENT PLAN

During droughts or other events where flows are reduced, advertising messages to the public to encourage wise water use to avoid the risk of restrictions should be put in place. It is recommended that measures, such as refraining from unnecessary irrigation, washing of cars and other outdoor equipment and having short showers are encouraged through this messaging.

Flow reductions can be imposed to assist in reducing use. WDC may impose water restrictions as a 'last resort' measure.

5.1 Drought Management Methods

In the event of a forecasted or unexpected drought, the methods described below may be implemented to manage water use. The various methods vary in nature, including pre-emptive, precautionary, voluntary and imposed measures.

5.1.1 Public Education Programmes

Public Education Programmes may include initiatives in schools, signs in public places, social media or newspapers. These campaigns may instil good habits, raise awareness and reduce peak and/or total demand, however without financial incentives the effectiveness may be limited.

5.1.2 Reduced Consumption

Reduced consumption may be encouraged or enforced depending on the severity of the drought. Actions to reduce total daily demand and/or peak may include one or a combination of the items in Table 10 below, which should vary in implementation depending on the severity of the drought:

Table 10: Options for Restriction Actions per Application

Application	Options for Restriction Actions may Include
Irrigation / Outdoor Water Use	Split outdoor water use between odd and even houses, to spread the load of daily water demand
	No watering of lawns by automated irrigation (hose, sprinklers) during a certain time e.g. between the hours of 6am to 9am and 4pm and 9pm, or no watering during the day to reduce evaporation losses
	No washing of vehicles or outdoor surfaces by house or water blasters (unless from rainwater)
	Garden watering by hand only (watering can or hose with a trigger nozzle)
	No watering of lawns permitted
	No watering of gardens permitted
	Total ban on external/outdoor water use
Indoor Water Use	Shorter showers
	Reducing laundry to one load per person per week
Commercial Use	No watering of lawns during a certain time e.g. between the hours of 6am to 9am and 4pm and 9pm, or no watering during the day to reduce evaporation
	No washing of vehicles or outdoor surfaces by house or water blasters (unless from rainwater)
	No watering of landscaped areas permitted
	Restricting watering of sports fields to those which have an irrigation system fitted with soil moisture or rain sensors
	Total ban on external/outdoor water use unless it is for health, safety, emergency or biosecurity reasons
	No sports fields irrigation permitted

5.1.3 Compliance and Enforcement Measures

Compliance and enforcement measure may be implemented in accordance with Council Bylaws and the LGA.

5.2 Mediums for Communication and Messaging

Ways to communicate to residents may include the mediums listed below.

- Schools Education Programmes,
- Signs in public places such as community boards or store fronts,
- Social media,
- Newspapers,
- Letter drops / mailouts

Key messages to the public may include the options listed in Table 11 below, however it is recommended that any communications are signed off through the appropriate person(s) within Council before releasing.

The messaging should be tailored to the severity and forecasted duration of the drought.

Table 11: Options for Key Messaging per Scenario

Scenario	Options for Key Messaging to the Public may Include
General Education	• Environmental benefits of water conservation • By everyone saving a little, together we can save a lot in the event of a drought
Forecasted drought	• Due to projected droughts residents are being urged to reduce their water use to avoid formal restrictions • The focus for the current, preventative drought management is on limiting outdoor water use to ensure that there is enough water for residential and business customers and to avoid mandatory restrictions should the drought persist • By everyone saving a little, together we can save a lot • Council is doing their part by proactively undertaking leak detection and repair work
Drought experienced	• Due to the ongoing drought, water restrictions are being introduced • Detail around the level of water restriction applied • Commencement date of water restrictions • Explanatory statement as to why restrictions are imposed, such as 'The local community water supply is struggling to meet demand, in some cases resulting in pressure drops in the network' • Details regarding capacity increases being implemented • Enforcement measures may apply should the restrictions not be complied with. Any restriction is enforced through council bylaws. • Council is doing their part by proactively undertaking leak detection and repair work

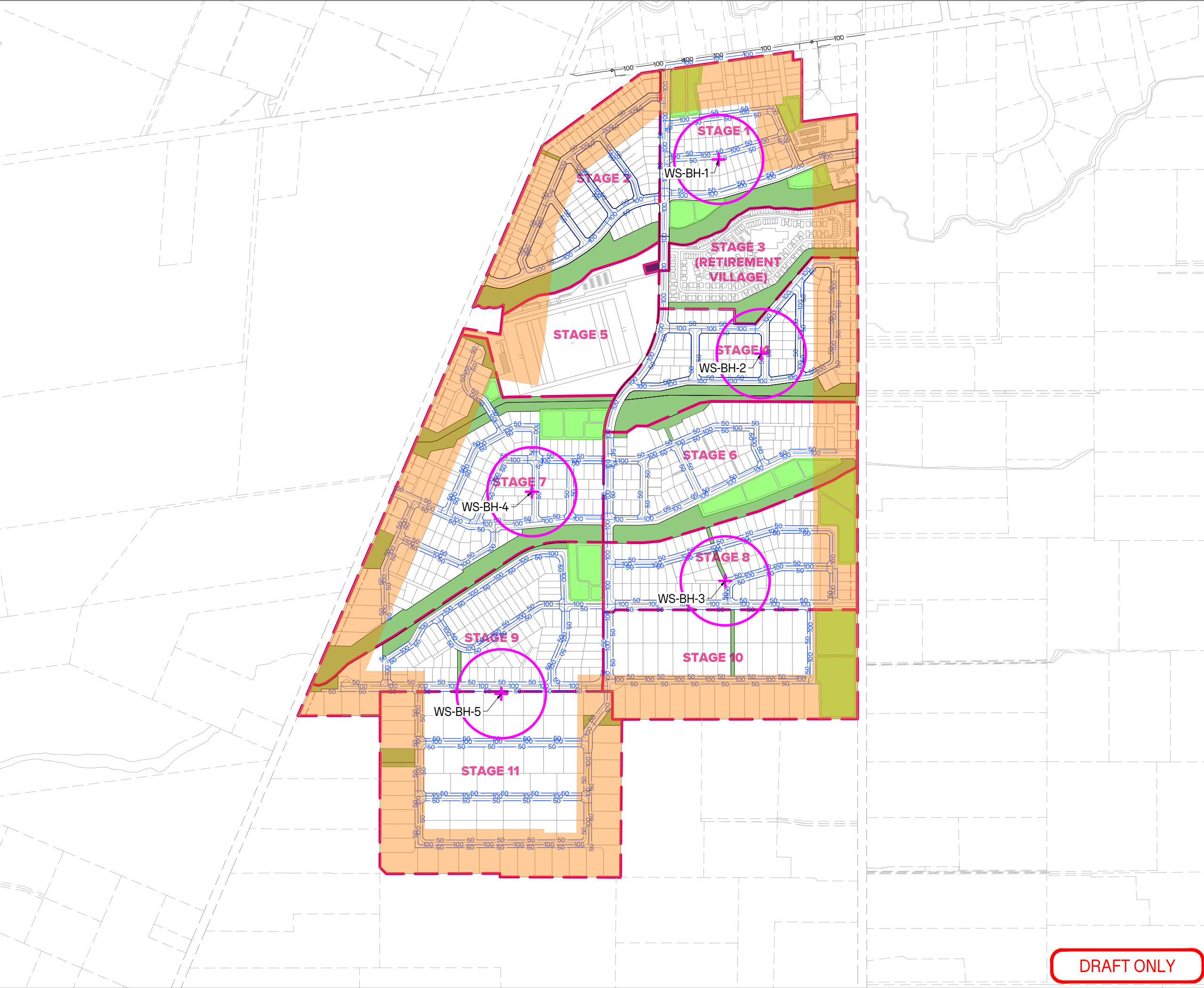
APPENDIX A | SCHEDULE 25 OF THE LWRP

Schedule 25 Water Supply Strategy

A water supply strategy is a document required to accompany an application for resource consent to take and use water for a community water supply. It must contain the following information in sufficient detail to enable the consent authority to be reasonably informed on the nature and extent of the activity and any effects of that activity on the environment:

1. A description of the community water supply system including:
 - (a) the location of the water source, surface water or groundwater abstraction point, and any relevant bore numbers; and
 - (b) a description of the water conveyance method; and
 - (c) the geographical extent of the water supply distribution network; and
 - (d) the estimated population supplied, or to be supplied, by the network; and
 - (e) primary water uses e.g. stockwater, domestic, industrial or commercial use; and
 - (f) expected peak demand water requirements; and
 - (g) water treatment methods; and
2. An assessment of existing and future demand for water to meet:
 - (a) reasonable domestic needs; and
 - (b) public health needs; and
 - (c) the responsibilities of municipal water supply authorities under the Local Government Act 2002 with respect to the supply of water; and
 - (d) any staged increase in allocation that may be sought during the term of the water permit to meet these demands; and
3. A description of:
 - (a) any proposed water conservation methods and measures to ensure efficient use of water (including both regulatory and non-regulatory actions); and
 - (b) measures to minimise water loss from the water reticulation network; and
 - (c) how the above measures in (3)(a) and (3)(b) will be implemented; and
 - (d) performance targets to measure the effectiveness of the methods implemented; and
 - (e) the timeframe for review of any specified actions listed in the implementation plan; and
4. An assessment of any alternative water sources available or alternative means of sourcing water; and
5. A drought management plan that includes:
 - (a) methods to reduce consumption during water shortage conditions and particularly consumption by non-essential agricultural, residential, industrial or trade processes; and
 - (b) a description of any methods to ensure water conservancy during times of drought, including but not limited to public education programmes and compliance or enforcement measures.

APPENDIX B | WATER SUPPLY BORE INDICATIVE LOCATIONS PLAN



- NOTES:**
1. LAYING OF PIPE MAINS OR CONNECTIONS TO EXISTING COUNCIL WATER RETICULATION SHALL BE MADE BY A WDC AUTHORISED WATER SUPPLY INSTALLER.
 2. ALL WORKS TO BE DONE IN ACCORDANCE WITH THE WDC ECOP.
 3. ALL RELEVANT APPROVALS ARE REQUIRED TO BE OBTAINED PRIOR TO THE START OF ANY WORKS.
 4. BORE LOCATIONS TO BE TESTED AS APPROPRIATE.
 5. NETWORK LAYOUT AND SIZING TO BE DETERMINED AT DETAILED DESIGN.

- LEGEND:**
- STAGE BOUNDARY
 - ABUTTAL BOUNDARY
 - PROPOSED LOT BOUNDARY
 - 15m LANDSCAPING STRIP SETBACK
 - STORMWATER MANAGEMENT AREA
 - RESERVE / WALKWAYS
 - 100m SETBACK
 - INDICATIVE WATER SUPPLY BORE LOCATION
 - PROPOSED WATERMAIN

B	ISSUED FOR INFORMATION	SS	16/04/2026
A	ISSUED FOR INFORMATION	SS	30/06/2025
REVISION DETAILS		BY	DATE

PROJECT: OHOKA
WAIMAKARIRI
CHRISTCHURCH

DESCRIPTION:
WATER SUPPLY BORE
INDICATIVE LOCATIONS PLAN

	SURVEYED	-	-
	DESIGNED	SS	16/04/2026
	DRAWN	KC	16/04/2026
	CHECKED	SS	-
	APPROVED	MP	-
SCALE	1:4,000 @A1	1:8,000 @A3	REVISION
STATUS	FOR INFORMATION		B
PROJECT	16013		
DWG NO	16013-00-SK-6600		

DRAFT ONLY

Appendix I: LWRP Schedule 12 Assessments

Model Parameters for drawdown calculations

Standard Screen Length :3m
Standard Pump Length :2m
Depth Range of pumped Aquifer taken from 0m till 31m
Transmissivity 975 m ² /d
Storativity 0.1

BW404572 Onika School	17.35	17.35	15.80	13.85	-1.728	12.122	9.088	2.454	0.844	0.0	16322	0.078	0.920	0.0	150	20086	0.044	0.888	0.0	150	24792	0.023	0.867	0.0	150	25874	0.020	0.864	0.0	150	17886	0.039	0.883	0.0	150	2003	1.047	0.1	0.12	0.12	
BW417152 Chelmsford High Park Limited	12.15	12.15	15.5	13.5	15.5	-2.000	12.200	9.088	2.454	0.844	0.0	16322	0.078	0.920	0.0	150	20086	0.044	0.888	0.0	150	24792	0.023	0.867	0.0	150	25874	0.020	0.864	0.0	150	17886	0.039	0.883	0.0	150	2003	1.047	0.1	0.12	0.12
BW419664 Mr BW Hughes & Mrs R McCourt	17.75	17.75	15.5	13.5	-1.000	12.200	9.088	2.454	0.844	0.0	16322	0.078	0.920	0.0	150	20086	0.044	0.888	0.0	150	24792	0.023	0.867	0.0	150	25874	0.020	0.864	0.0	150	17886	0.039	0.883	0.0	150	2003	1.047	0.1	0.12	0.12	
BW420258 Mr P D & Mrs M W Wilson	18	18	16.5	14.5	-1.340	13.100	10.528	2.832	0.880	0.0	16603	0.074	0.963	0.0	150	20865	0.074	0.963	0.0	150	27198	0.064	0.953	0.0	150	28075	0.057	0.947	0.0	150	18809	0.021	1.001	0.0	150	1732	1.242	0.1	0.12	0.12	
BW420602 JENNIFER HOLLAND	14	14	15	15	-1.000	13.000	7.200	2.160	0.720	0.0	16512	0.074	0.963	0.0	150	20865	0.074	0.963	0.0	150	27198	0.064	0.953	0.0	150	28075	0.057	0.947	0.0	150	18809	0.021	1.001	0.0	150	1732	1.242	0.1	0.12	0.12	
BW420763 BLACK P.C.	24	24	22	20	-2.470	15.830	12.664	3.364	1.450	0.0	16622	0.077	1.524	0.0	150	21475	0.080	1.535	0.0	150	28439	0.102	1.641	0.0	150	29319	0.095	1.634	0.0	150	6288	0.169	1.619	0.0	150	1730	2.156	0.1	0.12	0.12	
BW420927 Mr & Mrs J P O'Leary (NZ) Limited	25.18	25.18	25.18	25.18	-1.000	13.000	7.200	2.160	0.720	0.0	16512	0.074	0.963	0.0	150	20865	0.074	0.963	0.0	150	27198	0.064	0.953	0.0	150	28075	0.057	0.947	0.0	150	18809	0.021	1.001	0.0	150	1732	1.242	0.1	0.12	0.12	
BW422777 THELFE G.L.	9.1	9.1	15	15	-1.000	13.000	7.200	2.160	0.720	0.0	16512	0.074	0.963	0.0	150	20865	0.074	0.963	0.0	150	27198	0.064	0.953	0.0	150	28075	0.057	0.947	0.0	150	18809	0.021	1.001	0.0	150	1732	1.242	0.1	0.12	0.12	
BW426950 Mr & Mrs B P & A Bachman	20.24	20.24	17.24	15.24	-1.000	11.440	8.952	2.220	0.900	0.0	16620	0.072	0.962	0.0	150	20865	0.072	0.962	0.0	150	27198	0.062	0.952	0.0	150	28075	0.057	0.947	0.0	150	18809	0.021	1.001	0.0	150	1732	1.242	0.1	0.12	0.12	
BW427023 BLACK P.C.	0	0	15	15	-1.000	13.000	7.200	2.160	0.720	0.0	16512	0.074	0.963	0.0	150	20865	0.074	0.963	0.0	150	27198	0.064	0.953	0.0	150	28075	0.057	0.947	0.0	150	18809	0.021	1.001	0.0	150	1732	1.242	0.1	0.12	0.12	
BW427108 MCM LAM COMPANY	0	0	15	15	-1.000	13.000	7.200	2.160	0.720	0.0	16512	0.074	0.963	0.0	150	20865	0.074	0.963	0.0	150	27198	0.064	0.953	0.0	150	28075	0.057	0.947	0.0	150	18809	0.021	1.001	0.0	150	1732	1.242	0.1	0.12	0.12	
BW427474 BURROWS T.F.	11.2	11.2	15	15	-1.000	13.000	7.200	2.160	0.720	0.0	16512	0.074	0.963	0.0	150	20865	0.074	0.963	0.0	150	27198	0.064	0.953	0.0	150	28075	0.057	0.947	0.0	150	18809	0.021	1.001	0.0	150	1732	1.242	0.1	0.12	0.12	
BW430435 Russell Page	26.4	26.4	18.9	16.9	-0.860	13.260	10.060	2.860	1.178	0.0	17157	0.069	0.887	0.0	150	21867	0.068	1.074	0.0	150	28089	0.053	0.751	0.0	150	30293	0.011	0.780	0.0	150	10688	0.015	0.734	0.0	150	1734	1.721	0.0	0.12	0.12	
BW430435 Russell Page	26.4	26.4	18.9	16.9	-0.860	13.260	10.060	2.860	1.178	0.0	17157	0.069	0.887	0.0	150	21867	0.068	1.074	0.0	150	28089	0.053	0.751	0.0	150	30293	0.011	0.780	0.0	150	10688	0.015	0.734	0.0	150	1734	1.721	0.0	0.12	0.12	
BW430435 Russell Page	26.4	26.4	18.9	16.9	-0.860	13.260	10.060	2.860	1.178	0.0	17157	0.069	0.887	0.0	150	21867	0.068	1.074	0.0	150	28089	0.053	0.751	0.0	150	30293	0.011	0.780	0.0	150	10688	0.015	0.734	0.0	150	1734	1.721	0.0	0.12	0.12	
BW430435 Russell Page	26.4	26.4	18.9	16.9	-0.860	13.260	10.060	2.860	1.178	0.0	17157	0.069	0.887	0.0	150	21867	0.068	1.074	0.0	150	28089	0.053	0.751	0.0	150	30293	0.011	0.780	0.0	150	10688	0.015	0.734	0.0	150	1734	1.721	0.0	0.12	0.12	
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BW430435 Russell Page	26.4	26.4	18.9	16.9	-0.860	13.260	10.060	2.860	1.178	0.0	17157	0.069	0.887	0.0	150	21867	0.068	1.074	0.0	150	28089	0.053	0.751	0.0	150	30293	0.011	0.780	0.0	150	10688	0.015	0.734	0.0	150	1734	1.721	0.0	0.12	0.12	
BW430435 Russell Page	26.4	26.4	18.9	16.9	-0.860	13.260	10.060	2.860	1.178	0.0	17157	0.069	0.887	0.0	150	21867	0.068	1.074	0.0	150	28089	0.053	0.751	0.0	150	30293	0.011	0.780	0.0	150	10688	0.015	0.734	0.0	150	1734	1.721	0.0	0.12	0.12	
BW430435 Russell Page	26.4	26.4	18.9	16.9	-0.860	13.260	10.060	2.860	1.178	0.0	17157	0.069	0.887	0.0	150	21867	0.068	1.074	0.0	150	28089	0.053	0.751	0.0	150	30293	0.011	0.780	0.0	150	10688	0.015	0.734	0.0	150	1734	1.721	0.0	0.12	0.12	
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BW430435 Russell Page	26.4	26.4	18.9	16.9	-0.860	13.260	10.060	2.860	1.178	0.0	17157	0.069	0.887	0.0	150	21867	0.068	1.074	0.0	150	280																				

[illegible]

MS16984	L & A D Thomas	21	21	16.5	14.5	-3.600	10.900	8.720	2.180	0.538	0k	0	36033	0.000	0.538	0k	0	42660	0.000	0.538	0k	0	43660	0.000	0.538	0k	0	34666	0.000	0.538	0k	0	0.000	0.538	0k	0.012	0.112		
MS16987	MA B&M PC&A J F Horwell & Duffield	20	20	16.48	16.48	-4.720	11.110	8.420	2.320	0.519	0k	0	32213	0.000	0.519	0k	0	38133	0.000	0.519	0k	0	22274	0.000	0.519	0k	0	34642	0.000	0.519	0k	0	0.000	0.519	0k	0.012	0.112		
MS16989	MA & C JACKSON	23.83	23.83	21.83	19.83	-4.810	10.020	12.038	1.004	1.458	0k	0	32318	0.000	1.458	0k	0	23248	0.000	1.458	0k	0	22569	0.000	1.458	0k	0	15010	0.013	1.471	0k	0	150.073	1.501	0k	0.012	0.112		
MS16990	MEDIA AND CABLE JONES	24	24	22.5	20.5	-4.300	10.600	13.120	2.280	2.034	0k	0	30578	0.000	2.034	0k	150	22890	0.000	2.034	0k	0	22508	0.000	2.034	0k	0	13017	0.000	2.034	0k	0	0.000	2.034	0k	0.012	0.112		
MS16991	MR DA Macdonald	15	15	12	10	-1.800	6.000	6.480	1.180	1.180	0k	0	15031	0.000	1.180	0k	0	32653	0.000	1.180	0k	0	32653	0.000	1.180	0k	0	0	0.000	1.180	0k	0	0.000	1.180	0k	0.012	0.112		
MS16992	BONFANT R&A J P.D.	5.7	5.7	15	12	0	-0.950	9.500	2.740	1.810	0.241	0k	0	35101	0.000	0.241	0k	0	37448	0.000	0.241	0k	0	40778	0.000	0.241	0k	0	45917	0.000	0.241	0k	0	0.000	0.241	0k	0.012	0.112	
MS16997	BRIDGEMAN J&S (GOSWAGE M.T.)	24	24	20	18	0	-2.500	9.500	2.510	1.270	0k	0	35112	0.000	1.270	0k	0	35112	0.000	1.270	0k	0	27518	0.000	1.270	0k	0	23957	0.000	1.270	0k	0	0.000	1.270	0k	0.012	0.112		
MS16998	BRUNNEN LTD	20	20	17	15	0	-18.010	11.000	8.862	2.280	2.201	0k	0	30615	0.010	2.212	0k	150	28629	0.012	2.212	0k	0	26076	0.010	2.212	0k	0	32626	0.000	2.201	0k	0	0.000	2.201	0k	0.012	0.112	
MS16999	M R C MacDonald	12.8	15	15	12	0	-10.000	8.070	7.176	1.794	0.930	0k	0	39113	0.000	0.930	0k	0	42851	0.000	0.930	0k	0	42524	0.000	0.930	0k	0	43041	0.000	0.930	0k	0	0.000	0.930	0k	0	0	
MS17000	MR & MRS EDE	13.1	15	15	12	0	-4.000	11.000	11.000	2.700	0.520	0k	0	30272	0.000	0.520	0k	0	30272	0.000	0.520	0k	0	44645	0.000	0.520	0k	0	46421	0.000	0.520	0k	0	0.000	0.520	0k	0.012	0.112	
MS17074	LONDON W.A.	6.1	15	12	10	0	-1.740	8.260	6.068	1.850	1.111	0k	0	31833	0.000	1.111	0k	0	34903	0.000	1.111	0k	0	34663	0.000	1.111	0k	0	43047	0.000	1.111	0k	0	0.000	1.111	0k	0.012	0.112	
MS17076	POWELL CHAS.	15	15	12	10	0	-2.250	7.000	7.000	1.270	0.916	0k	0	32786	0.000	0.916	0k	0	32786	0.000	0.916	0k	0	32786	0.000	0.916	0k	0	32771	0.000	0.916	0k	0	0.000	0.916	0k	0.012	0.112	
MS17088	ABBOTT W.E.L.	16.7	16.7	13.7	11.7	0	-3.520	8.480	6.544	1.686	1.679	0k	0	32145	0.000	1.679	0k	0	23239	0.000	1.679	0k	0	22332	0.000	1.679	0k	0	150.072	1.611	1.686	0k	0	150.072	1.611	1.686	0k	0.012	0.112
MS17092	CRADOCK PT	16.2	16.2	14.2	12.2	0	-1.600	11.100	8.800	2.230	0.325	0k	0	38342	0.000	0.325	0k	0	40528	0.000	0.325	0k	0	47609	0.000	0.325	0k	0	43885	0.000	0.325	0k	0	0.000	0.325	0k	0.012	0.112	
MS17098	BLACK HAVEN LIMITED	24	24	22.5	20.5	0	-4.300	10.600	13.120	2.280	2.034	0k	0	30578	0.000	2.034	0k	150	22890	0.000	2.034	0k	0	22508	0.000	2.034	0k	0	13017	0.000	2.034	0k	0	0.000	2.034	0k	0.012	0.112	
MS174051	Damen Court	23.54	23.54	21.54	19.54	-1.664	17.886	13.490	3.577	0.596	0k	0	34048	0.000	0.596	0k	0	40434	0.000	0.596	0k	0	41381	0.000	0.596	0k	0	32210	0.000	0.596	0k	0	0.000	0.596	0k	0.012	0.112		
MS174062	PROST E.M.	23.8	23.8	21	18	0	-1.470	8.550	8.584	1.476	0.415	0k	0	38578	0.000	0.415	0k	0	40584	0.000	0.415	0k	0	40584	0.000	0.415	0k	0	45348	0.000	0.415	0k	0	0.000	0.415	0k	0.012	0.112	
MS174053	MR & MRS J & C F FIDZELLARD	23.8	23.8	20	18	0	-0.730	13.864	1.466	0.731	0k	0	36437	0.000	0.731	0k	0	38958	0.000	0.731	0k	0	40533	0.000	0.731	0k	0	32210	0.000	0.731	0k	0	0.000	0.731	0k	0.012	0.112		
MS170998	MR D Sutherland	20	20	17	15	0	-1.040	13.960	11.380	2.790	0.206	0k	0	39179	0.000	0.206	0k	0	47526	0.000	0.206	0k	0	48519	0.000	0.206	0k	0	44018	0.000	0.206	0k	0	0.000	0.206	0k	0.012	0.112	
MS170988	China Utilities Limited	27.15	27.15	24.15	22.15	-4.110	16.400	14.432	3.640	1.460	0k	0	33552	0.000	1.460	0k	0	33552	0.000	1.460	0k	0	22554	0.000	1.460	0k	0	150.067	1.401	1.460	0k	0	0.000	1.460	0k	0.012	0.112		
MS170940	MR & MRS R&W	24	24	22.5	20.5	0	-4.750	12.960	13.900	2.160	1.303	0k	0	33982	0.000	1.303	0k	0	24484	0.000	1.303	0k	0	23817	0.000	1.303	0k	0	150.066	1.388	1.388	0k	0	150.066	1.388	0k	0.012	0.112	
MS170947	Edwin	23.53	23.53	22	20	0	-4.155	15.847	12.676	3.199	1.747	0k	0	33581	0.000	1.747	0k	0	29872	0.000	1.747	0k	0	25982	0.000	1.747	0k	0	30088	0.000	1.747	0k	0	0.000	1.747	0k	0.012	0.112	
MS170942	David and Adrienne Rowland	24	24	22.5	20.5	0	-4.125	16.375	13.100	3.275	1.884	0k	0	33165	0.000	1.884	0k	0	24643	0.000	1.884	0k	0	22954	0.000	1.884	0k	0	150.077	1.800	1.884	0k	0	0.000	1.884	0k	0.012	0.112	
MS170954	Canterbury Regional Council	9	15	12	10	0	-3.720	6.200	5.024	2.256	2.388	Exceeded	0	31112	0.000	2.388	Exceeded	0	20247	0.012	2.388	Exceeded	0	25845	0.014	2.382	Exceeded	0	150.074	2.384	2.388	Exceeded	0	0.026	2.384	Exceeded	0.012	0.112	
MS170956	WFO COMMENCE	25.1	25.1	19.1	17.1	0	-3.000	13.500	10.900	2.700	0.433	0k	0	40937	0.000	0.433	0k	0	46535	0.000	0.433	0k	0	45662	0.000	0.433	0k	0	37292	0.000	0.433	0k	0	0.000	0.433	0k	0.012	0.112	
MS170958	CHARTERS	19.8	19.8	18.8	16.8	0	-2.650	12.590	9.720	2.490	1.250	0k	0	34412	0.000	1.250	0k	0	26120	0.019	1.270	0k	0	25028	0.020	1.270	0k	0	150.052	0.018	1.267	0k	0	150.055	1.305	0k	0.012	0.112	
MS170957	PROST E.M.	15	15	12	10	0	-1.480	8.520	6.035	1.794	1.044	0k	0	33983	0.000	1.044	0k	0	42545	0.000	1.044	0k	0	42545	0.000	1.044	0k	0	43585	0.000	1.044	0k	0	0.000	1.044	0k	0	0	
MS170972	BRUNNEN LTD	12.2	15	12	10	0	-1.000	9.000	7.200	1.800	0.897	0k	0	38079	0.000	0.897	0k	0	40661	0.000	0.897	0k	0	40661	0.000	0.897	0k	0	42319	0.000	0.897	0k	0	0.000	0.897	0k	0.012	0.112	
MS170775	MR & MRS RWA & F FRASER	18	18	16	14	0	-5.000	8.800	7.600	1.760	2.100	Exceeded	0	31162	0.000	2.100	Exceeded	0	26433	0.018	2.110	Exceeded	0	25049	0.018	2.122	Exceeded	0	150.073	2.100	2.100	Exceeded	0	0.040	2.140	Exceeded	0.012	0.112	
MS170670	SOUTHERN CHEMICAL LTD.	12	12	10	8	0	-4.368	5.812	4.650	1.160	1.685	Exceeded	0	33842	0.000	1.685	Exceeded	0	37939	0.027	1.711	Exceeded	0	22739	0.031	1.785	Exceeded	0	150.050	1.685	1.685	Exceeded	0	0.058	1.742	Exceeded	0.012	0.112	
MS170622	Jacques & Daisy Bonfield	25.5	25.5	24	22	0	-3.111	17.869	14.295	3.764	2.489	0k	0	32763	0.000	2.489	0k	0	23744	0.027	1.518	0k	0	22810	0.030	1.519	0k	0	150.068	1.507	1.518	0k	0	150.068	1.507	1.518	0k	0.012	0.112
MS170684	MR & MRS H & MRS M SINCULAR	18	18	17	15	0	-2.140	12.080	10.280	2.572	1.232	0k	0	33537	0.000	1.232	0k	0	28141	0.014	1.246	0k	0	28141	0.014	1.246	0k	0	150.046	0.016	1.246	0k	0	0.000	1.246	0k	0.012	0.112	
MS170687	MR & MRS H & MRS M SINCULAR	23.87	23.87	21.87	19.87	0	-3.184	15.938	12.964	3.286	2.065	0k	0	33537	0.000	2.065	0k	0	28141	0.014	1.246	0k	0	28141	0.014	1.246	0k	0	150.046	0.016	1.246	0k	0	0.000	1.246	0k	0.012	0.112	
MS170692	GILES R.L.	9.1	15	12	10	0	-2.370	6.700	5.240	1.526	1.159	0k	0	36245	0.000	1.159	0k	0	30384	0.010	1.159	0k	0	30384	0.010	1.159	0k	0	24880	0.015	1.174	0k	0	0.000	1.174	0k	0.012	0.112	
MS170694	MR & MRS J & MRS J L. D. P. H.	14.08	15	12	10	0	-3.860	6.110	4.888	1.222	0.514	Exceeded	0	33784	0.000	0.514	Exceeded	0	30148	0.011	0.511	Exceeded	0	29041	0.012	0.511	Exceeded	0	150.049	0.012	0.511	Exceeded	0	0.023	2.127	Exceeded	0.012	0.112	
MS170697	MR & MRS J & MRS J L. D. P. H.	23	23	22	20	0	-3.440	16.480	13.188	3.290	1.410	0k	0	39180	0.000	1.410																							

[illegible]

MIS06039 SANDRY CL	21.3	21.3	18.3	18.3	-4.470	7.830	6.264	1.568	1.082	ok	4270.9	0.000	1.082	ok	0	3862.4	0.000	1.082	ok	0	3121.3	0.000	1.082	ok	0	3012.8	0.011	1.082	ok	150	3789.0	0.000	1.082	ok	0	0.011	1.082	ok	0	0	
MIS06080 J A Richards Limited	25.18	25.18	19.26	17.26	-4.420	12.640	10.112	2.528	0.956	ok	4271.6	0.000	0.956	ok	0	3873.4	0.000	0.956	ok	0	3063.1	0.000	0.956	ok	0	2986.3	0.011	1.006	ok	150	3776.1	0.000	0.956	ok	0	0.011	1.006	ok	4.9	0.88	
BW2303279 Mr R G McLeod and Mrs S L McLeod	26.5	26.5	25	23	-0.600	13.400	10.720	2.680	0.978	ok	4276.8	0.000	0.978	ok	0	3896.8	0.000	0.978	ok	0	3083.9	0.000	0.978	ok	0	2979.0	0.011	0.989	ok	150	3663.1	0.000	0.978	ok	0	0.011	0.989	ok	0.12	0.12	
BW2303307 Mr G & M McLeod	26.5	26.5	25	23	-0.600	13.400	10.720	2.680	0.978	ok	4276.8	0.000	0.978	ok	0	3896.8	0.000	0.978	ok	0	3083.9	0.000	0.978	ok	0	2979.0	0.011	0.989	ok	150	3663.1	0.000	0.978	ok	0	0.011	0.989	ok	0.12	0.12	
BW2404570 Dr MacDonell	21	21	19.1	17.1	-1.088	15.402	12.321	3.080	0.322	ok	4282.0	0.000	0.322	ok	0	4661.1	0.000	0.322	ok	0	4800.3	0.000	0.322	ok	0	4603.8	0.000	0.322	ok	0	3873.5	0.000	0.322	ok	0	0.000	0.322	ok	0.12	0.12	
MIS06090 Mr & Mrs R W & E A McMaicken	18	18	16	14	-2.010	11.000	8.872	2.218	1.074	ok	4289.7	0.000	1.074	ok	0	4313.6	0.000	1.074	ok	0	3382.8	0.000	1.074	ok	0	3383.3	0.000	1.074	ok	0	3189.3	0.000	1.074	ok	4	2.31	0.000	1.074	ok	0	0
MIS06096 REDONCE L A	20	20	17	15	-4.420	10.360	8.364	2.076	1.050	ok	4291.3	0.000	1.050	ok	0	3904.9	0.000	1.050	ok	0	3102.9	0.000	1.050	ok	0	2987.3	0.011	1.016	ok	150	3663.3	0.000	1.050	ok	0	0.011	1.016	ok	0.12	0.12	
BW2307051 Craig & Roberta Schroder	24	24	22.5	20.5	-4.568	15.932	12.745	3.188	1.082	ok	4292.0	0.000	1.082	ok	0	3890.5	0.000	1.082	ok	0	3128.3	0.000	1.082	ok	0	3026.4	0.011	1.093	ok	150	3773.5	0.000	1.082	ok	0	0.011	1.093	ok	0.12	0.12	
MIS07189 TULL L R & R A	14	15	12	10	-3.782	6.218	4.975	1.244	1.463	Exceeded	4293.2	0.000	1.463	Exceeded	0	3863.8	0.000	1.463	Exceeded	0	2737.7	0.000	1.463	Exceeded	0	3669.3	0.000	1.463	Exceeded	0	3731.4	0.000	1.463	Exceeded	0	0.000	1.463	Exceeded	0	0	
BW2303023 Kevin Adamson	24	24	22.62	20.62	-4.633	15.987	12.789	3.197	1.070	ok	4297.4	0.000	1.070	ok	0	3907.0	0.000	1.070	ok	0	3141.4	0.000	1.070	ok	0	3033.7	0.010	1.080	ok	150	3761.5	0.000	1.070	ok	0	0.010	1.080	ok	0.12	0.12	
BW2303296 Mr. R Baertens and Mrs L Collins	30	30	27	25	-4.460	20.540	16.432	4.108	0.892	ok	4317.8	0.000	0.892	ok	0	3994.2	0.000	0.892	ok	0	3109.7	0.000	0.892	ok	0	3017.0	0.011	0.902	ok	150	3518.6	0.000	0.892	ok	0	0.011	0.902	ok	0.12	0.12	
MIS06952 Mr A G Reed & Mrs A J Dove	21	21	18.4	16.4	-5.470	10.930	8.744	2.186	0.876	ok	4326.8	0.000	0.876	ok	0	4021.2	0.000	0.876	ok	0	3131.3	0.000	0.876	ok	0	3040.6	0.010	0.886	ok	150	3518.4	0.000	0.876	ok	0	0.010	0.886	ok	0.12	0.12	
BW2303278 MR RYAN CRAIG ADAMS	18.5	18.5	16.62	14.62	-3.809	10.711	8.569	2.142	1.273	ok	4317.8	0.000	1.273	ok	0	3888.8	0.000	1.273	ok	0	3026.5	0.000	1.273	ok	0	3433.4	0.000	1.273	ok	0	4363.5	0.000	1.273	ok	0	0.000	1.273	ok	0.12	0.12	
MIS07330 DENNISON N W	24	24	21	19	-4.970	14.030	11.224	2.806	0.882	ok	4339.8	0.000	0.882	ok	0	3969.9	0.000	0.882	ok	0	3138.3	0.000	0.882	ok	0	3058.3	0.010	0.872	ok	150	3684.2	0.000	0.882	ok	0	0.010	0.872	ok	0	0	
MIS06849 Mr & Mrs S M & M J Pettigrew	24	24	21	19	-5.520	13.480	10.784	2.696	0.892	ok	4341.4	0.000	0.892	ok	0	4033.0	0.000	0.892	ok	0	3139.0	0.000	0.892	ok	0	3056.3	0.010	0.902	ok	150	3682.8	0.000	0.892	ok	0	0.010	0.902	ok	0.12	0.12	
MIS06338 Parsons Nathan	14.3	15	12	10	-3.070	6.930	5.544	1.386	1.082	ok	4344.2	0.000	1.082	ok	0	4207.5	0.000	1.082	ok	0	3358.6	0.000	1.082	ok	0	3318.7	0.000	1.082	ok	0	3251.9	0.000	1.082	ok	0	0.000	1.082	ok	0.12	0.12	
MIS06835 REID G D & R	22.5	22.5	19.5	17.5	-4.780	12.720	10.176	2.544	1.142	ok	4344.8	0.000	1.142	ok	0	3997.8	0.000	1.142	ok	0	3164.8	0.000	1.142	ok	0	3189.7	0.000	1.142	ok	0	4198.6	0.000	1.142	ok	0	0.000	1.142	ok	0.12	0.12	
BW2303210 Peter Gerard Harris	24	24	22.5	20.5	-3.200	17.300	13.840	3.460	0.857	ok	4353.5	0.000	0.857	ok	0	4022.5	0.000	0.857	ok	0	3143.9	0.000	0.857	ok	0	3049.3	0.010	0.867	ok	150	3573.8	0.000	0.857	ok	0	0.010	0.867	ok	0.12	0.12	

Input file used Bore Location 1.prn

Model Parameters for drawdown calculations

Standard Screen Length :3m

Standard Pump Length :2m

Depth Range of pumped Aquifer taken from 31m till 999m

Transmissivity 115 m2/d

Storativity 0.00063

Leakage 660 OR 0.0003 KB

Sigma 0.1

T0 975 m2/d

WellNo	Owner	Depth	AdoptDepth	Top_Screen	CutOff	Calc80Min	Available	Protected	DD4Interference	CumDD	OkCumDD	VIR/0001_Dist	VIR/0001_DDA	VIR/0001_DD	VIR/0001_DDok	VIR/0001_DomP	Q7	Q150	Existing DD	Change	Result
VIR/0001		84	84	81	79	-3.009	75.991	60.793	15.198	0.637 ok		0.0	0.000	0.637 ok		0	28.96	28.96	#N/A		
M35/0595	W Power	18.3	18.3	6.8	4.8	-2.150	2.650	2.120	0.530	0.947 Exceeded		99.0	0.392	1.339 Exceeded		150	4.9	4.9	0.783	-0.391	Decreased
M35/10517	Union Specialties (NZ) Limited	23.16	23.16	21.16	19.16	-4.300	14.860	11.888	2.972	1.850 ok		241.6	0.371	2.221 ok		150	0.12	0.12	0.961	-0.589	Decreased
M35/5736	Canterbury Pet Foods Limited	15.5	15.5	12.5	10.5	-2.350	8.150	6.520	1.630	1.652 Exceeded		298.9	0.361	2.013 Exceeded		150	4.29	3.33	0.719	-0.358	Decreased
M35/7171	Glenalbany Deer Park Limited	13	15	12	10	-2.350	7.650	6.120	1.530	1.652 Exceeded		298.9	0.361	2.013 Exceeded		150	0	0	0.719	-0.358	Decreased
M35/7152	Glenalbany Deer Park Limited	15.5	15.5	12.5	10.5	-2.988	7.512	6.009	1.502	1.660 Exceeded		310.5	0.359	2.018 Exceeded		150	3.95	2.77	0.992	-0.634	Decreased
M35/4683	HARRIS I.R.	9.3	15	12	10	-2.860	7.140	5.712	1.428	0.889 ok		383.6	0.345	1.234 ok		150	0.12	0.12	0.570	-0.225	Decreased
M35/4727	THIELE G.J.	9.1	15	12	10	-2.220	7.780	6.224	1.556	1.769 Exceeded		384.9	0.344	2.114 Exceeded		150	0.12	0.12	0.929	-0.585	Decreased
M35/6867	HARRIS I. R.	20	20	17	15	-2.520	12.480	9.984	2.496	1.715 ok		441.7	0.333	2.048 ok		150	0.12	0.12	0.519	-0.186	Decreased
M35/6688	MASON W.I.G	18	18	15	13	-1.900	11.100	8.880	2.220	1.513 ok		447.7	0.332	1.845 ok		150	0.12	0.12	1.864	-1.532	Decreased
M35/3065	Mr & Mrs P J & R J Sherriff	12	15	12	10	-1.900	8.100	6.480	1.620	1.573 ok		483.8	0.325	1.898 Exceeded		150	0	0	1.047	-0.723	Decreased
M35/6587	WARREN AH & BL	15	15	12	10	-2.010	7.990	6.392	1.598	0.541 ok		534.8	0.314	0.856 ok		150	0.12	0.12	0.644	-0.330	Decreased
M35/10480	Mr & Mrs DW & TL Lindsay	23.73	23.73	21.73	19.73	-4.230	15.500	12.400	3.100	0.705 ok		547.4	0.312	1.017 ok		150	0.12	0.12	0.494	-0.247	Decreased
M35/4768	Southern Chicks Limited	14.3	15	12	10	-2.570	7.430	5.944	1.486	1.860 Exceeded		551.6	0.311	2.171 Exceeded		150	0.29	0.29	0.524	-0.213	Decreased
M35/3064	Mr & Mrs P J & R J Sherriff	12.5	15	12	10	-1.810	8.190	6.552	1.638	1.443 ok		552.3	0.311	1.753 Exceeded		150	0	0	1.094	-0.783	Decreased
M35/7619	Ohoka Utilities Limited	26.77	26.77	23.77	21.77	-4.320	17.450	13.960	3.490	1.503 ok		577.7	0.306	1.808 ok		150	12.5	9.43	0.416	-0.111	Decreased
M35/8160	Ohoka Utilities Limited	28.7	28.7	25.8	23.8	-4.030	19.770	15.816	3.954	1.242 ok		636.0	0.294	1.536 ok		150	15	15	0.386	-0.093	Decreased
M35/3066	MASON W.I.G.	6.7	15	12	10	-1.720	8.280	6.624	1.656	1.464 ok		661.2	0.289	1.753 Exceeded		150	0.12	0.12	1.612	-1.324	Decreased
M35/4428	HARRIS I.R.	19.4	19.4	16.4	14.4	-1.910	12.490	9.992	2.498	0.257 ok		663.9	0.288	0.545 ok		150	0.12	0.12	0.757	-0.469	Decreased
M35/6773	BLACK P.C.	24	24	22	20	-4.170	15.830	12.664	3.166	0.269 ok		671.8	0.286	0.555 ok		150	0.12	0.12	0.706	-0.419	Decreased
M35/4979	Ms M E Hopkinson	20	20	17	15	-2.260	12.740	10.192	2.548	1.793 ok		673.6	0.286	2.079 ok		150	15.71	10	0.897	-0.611	Decreased
M35/6851	Mr S T Hampton	18	18	15	13	-1.930	11.070	8.856	2.214	0.438 ok		684.1	0.284	0.722 ok		150	1.83	1.28	0.531	-0.247	Decreased
M35/8975	P A & P L Trumic	22	22	20.5	18.5	-3.910	14.590	11.672	2.918	0.626 ok		696.1	0.281	0.907 ok		150	0.12	0.12	0.445	-0.163	Decreased
M35/9218	Sparrow K & H	24	24	22.5	20.5	-3.920	16.580	13.264	3.316	0.685 ok		697.0	0.281	0.967 ok		150	0	0	0.414	-0.133	Decreased
M35/8414	SANDERS SW & LR	17.8	17.8	16.4	14.4	-2.760	11.640	9.312	2.328	1.918 ok		728.5	0.275	2.193 ok		150	0.12	0.12	0.378	-0.103	Decreased
M35/4681	SANDERS E.W.& T.J.	12.8	15	12	10	-2.750	7.250	5.800	1.450	2.132 Exceeded		729.7	0.275	2.406 Exceeded		150	0.12	0.12	0.397	-0.122	Decreased
M35/9558	MR & MRS A F & C J ROSLING	24	24	22.5	20.5	-3.840	16.660	13.328	3.332	0.483 ok		751.9	0.270	0.754 ok		150	0	0	0.441	-0.170	Decreased
M35/11063	MR & MRS EJ & JR GRAHAM	25	25	22	20	-4.400	15.600	12.480	3.120	2.026 ok		796.2	0.262	2.287 ok		150	0.12	0.12	0.443	-0.181	Decreased
M35/4678	MCINTYRE J.L.	20.1	20.1	17.1	15.1	-4.340	10.760	8.608	2.152	1.442 ok		848.2	0.251	1.694 ok		150	0.12	0.12	0.297	-0.045	Decreased
M35/0596	Canterbury Regional Council	2.9	15	12	10	-0.750	9.250	7.400	1.850	1.624 ok		852.1	0.251	1.875 Exceeded		150	0.12	0.12	1.357	-1.106	Decreased
M35/11227	KAVANAGH FAMILY TRUST	18	18	17	15	-2.590	12.410	9.928	2.482	2.137 ok		867.8	0.248	2.385 ok		150	0.12	0.12	0.374	-0.126	Decreased
M35/6483	GRAINGER .P.	20	20	18	16	-1.830	14.170	11.336	2.834	0.115 ok		868.1	0.248	0.362 ok		150	0.12	0.12	0.809	-0.561	Decreased
M35/4741	SCOTT J.H.	9.1	15	12	10	-2.790	7.210	5.768	1.442	2.403 Exceeded		923.2	0.237	2.640 Exceeded		150	0.12	0.12	0.640	-0.403	Decreased
BW23/0218	Sarah Craig Trust	24	24	21	19	-3.724	15.276	12.221	3.055	0.669 ok		933.3	0.235	0.905 ok		150	0.12	0.12	0.299	-0.063	Decreased
M35/6061	CAMERON N & A	20.8	20.8	17.8	15.8	-4.140	11.660	9.328	2.332	0.268 ok		943.9	0.233	0.502 ok		150	0.12	0.12	0.490	-0.257	Decreased
M35/4552	Mr & Mrs D K & E C Purvis	9	15	12	10	-2.860	7.140	5.712	1.428	2.242 Exceeded		945.6	0.233	2.475 Exceeded		150	3.8	3.8	0.598	-0.364	Decreased
M35/6797	WITHERS D	20	20	17	15	-1.950	13.050	10.440	2.610	0.142 ok		956.2	0.231	0.373 ok		150	0.12	0.12	0.557	-0.326	Decreased
M35/7023	BLACK PC & KL	0	15	12	10	-2.833	7.167	5.734	1.433	0.130 ok		984.7	0.226	0.356 ok		150	0.12	0.12	0.605	-0.379	Decreased
M35/9740	MR & MRS K & L CAMPAGNOLO	17.8	17.8	15.29	13.29	-2.100	11.190	8.952	2.238	0.297 ok		1040.2	0.216	0.513 ok		150	0.12	0.12	0.380	-0.164	Decreased
M35/10524	Mr & Ms BR & DV Hickling & Sinclair	25.9	25.9	23.9	21.9	-4.250	17.650	14.120	3.530	0.764 ok		1052.7	0.214	0.978 ok		150	0.12	0.12	0.246	-0.032	Decreased
M35/9423	Mr & Mrs P J & R J Sherriff	30	30	27	25	-2.677	22.323	17.859	4.465	0.351 ok		1063.0	0.212	0.563 ok		150	0	0	0.645	-0.433	Decreased
M35/18231	MR & MRS MWH & JL TYREE	18	18	17	15	-1.540	13.460	10.768	2.692	2.500 ok		1074.2	0.210	2.710 Exceeded		150	0.12	0.12	0.304	-0.094	Decreased
M35/11106	MR & MRS RJ & LK THOMAS	17	17	16	14	-2.890	11.110	8.888	2.222	2.484 Exceeded		1076.5	0.210	2.694 Exceeded		150	0.12	0.12	0.325	-0.115	Decreased
M35/9222	Mr A & Mrs F A MacKenzie	24	24	22.5	20.5	-3.880	16.620	13.296	3.324	0.368 ok		1092.8	0.207	0.575 ok		150	0.12	0.12	0.283	-0.076	Decreased
M35/5332	Ohoka Downs Society Inc	35.2	35.2	32.5	30.5	-4.200	26.300	21.040	5.260	0.000 ok		1094.9	0.771	0.771 ok		150	17.44	17.35	#N/A	#N/A	#N/A
M35/9630	MR B T LENNOX	16.59	16.59	14.59	12.59	-2.910	9.680	7.744	1.936	2.440 Exceeded		1119.8	0.202	2.643 Exceeded		150	0.12	0.12	0.275	-0.072	Decreased
M35/1836	Mr & Mrs R S & C R Scott	16.8	16.8	1	-1	-2.130	-3.130	-2.504	-0.626	0.107 Screen>>		1130.3	0.201	0.307 Exceeded		150	4.75	2.54	0.657	-0.457	Decreased
M35/8606	BURNEY RT	24.8	24.8	23.27	21.27	-3.920	17.350	13.880	3.470	0.505 ok		1138.1	0.199	0.705 ok		150	0.12	0.12	0.233	-0.034	Decreased
M35/4728	ADAMS R.D.	27.4	27.4	24.4	22.4	-4.130	18.270	14.616	3.654	0.291 ok		1139.4	0.199	0.490 ok		150	0.12	0.12	0.334	-0.134	Decreased

M35/4729	ADAMS R.D.	27.4	27.4	24.4	22.4	-4.130	18.270	14.616	3.654	0.291 ok	1139.4	0.199	0.490 ok	150	0	0	0.334	-0.134 Decreased	
M35/4772	Robin Ames	0	15	12	10	-2.701	7.299	5.839	1.460	0.000 ok	1139.9	0.199	0.199 ok	150	0.12	0.12	0.801	-0.602 Decreased	
M35/9126	Van't Veen G B & J G	30.5	30.5	19	17	-3.900	13.100	10.480	2.620	0.388 ok	1141.2	0.199	0.587 ok	150	1.47	1.47	0.248	-0.049 Decreased	
M35/4738	A. Smith	13.7	15	12	10	-1.780	8.220	6.576	1.644	0.319 ok	1148.8	0.198	0.517 ok	150	0.12	0.12	0.697	-0.500 Decreased	
M35/4774	BURROWS T.F.	11.2	15	12	10	-1.870	8.130	6.504	1.626	0.119 ok	1162.1	0.195	0.314 ok	150	0.12	0.12	0.543	-0.347 Decreased	
M35/7903	DAVIDSON LA & J	18	18	16.5	14.5	-1.610	12.890	10.312	2.578	0.138 ok	1166.3	0.195	0.332 ok	150	0.12	0.12	0.450	-0.255 Decreased	
M35/4746	VERKERK A.	9.1	15	12	10	-1.610	8.390	6.712	1.678	2.062 Exceeded	1174.3	0.193	2.255 Exceeded	150	0.12	0.12	1.240	-1.047 Decreased	
M35/5021	SCOTT R.S.	12.8	15	12	10	-1.820	8.180	6.544	1.636	0.218 ok	1199.0	0.189	0.407 ok	150	0.12	0.12	0.599	-0.409 Decreased	
M35/3032	Kate Mullins	19.7	19.7	16.7	14.7	-1.690	13.010	10.408	2.602	0.208 ok	1206.0	0.188	0.396 ok	150	0.12	0.12	0.867	-0.679 Decreased	
M35/4742	SCOTT J.H.	9.1	15	12	10	-3.330	6.670	5.336	1.334	2.263 Exceeded	1206.6	0.188	2.451 Exceeded	150	0.12	0.12	0.391	-0.203 Decreased	
M35/4725	ROBSON W.J.	19.8	19.8	16.8	14.8	-1.960	12.840	10.272	2.568	0.135 ok	1208.7	0.188	0.323 ok	150	0.12	0.12	0.433	-0.245 Decreased	
M35/2730	Mr A D & Ms A Smith	7.3	15	12	10	-1.780	8.220	6.576	1.644	0.104 ok	1210.9	0.187	0.291 ok	150	4	2.03	0.655	-0.468 Decreased	
M35/10634	MR & MRS C D & C L HEAPHY	18	18	17	15	-3.470	11.530	9.224	2.306	2.740 Exceeded	1211.8	0.187	2.927 Exceeded	150	0.12	0.12	0.300	-0.113 Decreased	
M35/10507	Mr GA Brown	24.16	24.16	22.16	20.16	-4.460	15.700	12.560	3.140	2.508 ok	1222.2	0.186	2.693 ok	150	0.12	0.12	0.248	-0.063 Decreased	
M35/0308	Mr E A Anderson	9.5	15	12	10	-3.190	6.810	5.448	1.362	2.375 Exceeded	1234.1	0.184	2.559 Exceeded	150	4.71	2.75	0.419	-0.235 Decreased	
M35/4737	Messrs J G & G B van't Veen	27.85	27.85	23.05	21.05	-4.190	16.860	13.488	3.372	0.371 ok	1243.5	0.182	0.554 ok	150	0.9	0.9	0.214	-0.032 Decreased	
BW23/0705	Renee Browne	22.89	22.89	21.39	19.39	-3.953	15.437	12.350	3.087	0.356 ok	1252.0	0.181	0.537 ok	150	0.12	0.12	0.224	-0.043 Decreased	
M35/3306	Merv Emms	17	17	14	12	-1.580	10.420	8.336	2.084	0.348 ok	1255.8	0.180	0.528 ok	150	3	3	0.926	-0.745 Decreased	
M35/10731	MR & MRS PJ & RJ HEAPHY	22	22	21	19	-4.070	14.930	11.944	2.986	3.203 Exceeded	1260.6	0.180	3.382 Exceeded	150	0.12	0.12	0.256	-0.077 Decreased	
M35/4554	A Verkerk Limited	7.5	15	12	10	-1.600	8.400	6.720	1.680	1.927 Exceeded	1289.7	0.175	2.102 Exceeded	150	11.88	11.88	1.167	-0.992 Decreased	
M35/0305	LESLIE D.H. & M.A.	5.8	15	12	10	-1.550	8.450	6.760	1.690	1.924 Exceeded	1299.1	0.174	2.098 Exceeded	150	0.12	0.12	1.416	-1.242 Decreased	
M35/10179	Mr & Mrs DA & JA Scott	23.5	23.5	21.5	19.5	-5.950	13.550	10.840	2.710	1.830 ok	1299.7	0.174	2.004 ok	150	0.12	0.12	0.190	-0.016 Decreased	
M35/11103	MR & MS DS & DJ VAN VOORST & MASON	18	18	17	15	-3.200	11.800	9.440	2.360	2.914 Exceeded	1304.0	0.173	3.087 Exceeded	150	0	0	0.258	-0.085 Decreased	
BW24/0321	Waimakariri District Council	2.5	15	12	10	-4.110	5.890	4.712	1.178	0.193 ok	1309.1	0.172	0.365 ok	150	0.12	0.12	0.254	-0.082 Decreased	
M35/0350	Ohoka Utilities Limited	11.6	15	12	10	-6.810	3.190	2.552	0.638	1.790 Exceeded	1314.6	0.171	1.961 Exceeded	150	30	30	0.237	-0.066 Decreased	
M35/7618	Ohoka Utilities Limited	25.8	25.8	22.8	20.8	-4.390	16.410	13.128	3.282	1.091 ok	1316.3	0.171	1.262 ok	150	12.5	9.43	0.165	0.007 Increased	
M35/6181	WALKER D.J.	12	15	12	10	-1.560	8.440	6.752	1.688	0.417 ok	1338.6	0.168	0.585 ok	150	0.12	0.12	0.909	-0.742 Decreased	
M35/1834	MEREDITH A (EX MCINTYRE)	20.3	20.3	17.2	15.2	-4.380	10.820	8.656	2.164	0.478 ok	1371.2	0.163	0.641 ok	150	0	0	0.170	-0.007 Decreased	
M35/0683	MEREDITH A (EX MCINTYRE)	11.8	15	12	10	-2.570	7.430	5.944	1.486	0.476 ok	1375.7	0.162	0.638 ok	150	0.12	0.12	0.170	-0.008 Decreased	
M35/18188	MR M P EMMS	18	18	16.86	14.86	-1.240	13.620	10.896	2.724	0.101 ok	1377.4	0.162	0.263 ok	150	0.12	0.12	0.724	-0.562 Decreased	
M35/8594	Ohoka Utilities Limited	28.3	28.3	25.3	23.3	-4.160	19.140	15.312	3.828	1.587 ok	1399.1	0.159	1.746 ok	150	7	7	0.167	-0.008 Decreased	
M35/4099	CAMERON J.G. & J.L.	11.5	15	12	10	-2.980	7.020	5.616	1.404	2.538 Exceeded	1410.1	0.157	2.695 Exceeded	150	0.12	0.12	0.375	-0.217 Decreased	
BW24/0251	Michael Hussey	50	50	45.1	43.1	-0.820	42.280	33.824	8.456	0.584 ok	1411.2	0.471	1.055 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/6794	BROWN K.T.	15	15	12	10	-2.090	7.910	6.328	1.582	0.150 ok	1415.1	0.157	0.306 ok	150	0.12	0.12	0.285	-0.128 Decreased	
M35/8662	WHYTE GK & C	19	19	17	15	-1.840	13.160	10.528	2.632	0.102 ok	1417.2	0.156	0.258 ok	150	0.12	0.12	0.443	-0.287 Decreased	
M35/6123	ALLISON .R.	13.6	15	12	10	-1.840	8.160	6.528	1.632	0.102 ok	1445.1	0.153	0.254 ok	150	0.12	0.12	0.424	-0.272 Decreased	
M35/0367	Mr & Mrs P J & R J Sherriff	9.4	15	12	10	-1.480	8.520	6.816	1.704	2.091 Exceeded	1457.9	0.151	2.242 Exceeded	150	0	0	0.771	-0.620 Decreased	
M35/8112	Walker DJH and CM	20.25	20.25	18.25	16.25	-3.970	12.280	9.824	2.456	0.331 ok	1462.8	0.150	0.481 ok	150	0.12	0.12	0.744	-0.594 Decreased	
M35/0676	BEZZANT AM & JM	15.5	15.5	12.5	10.5	-7.320	3.180	2.544	0.636	0.201 ok	1469.8	0.149	0.351 ok	150	0.12	0.12	0.181	-0.032 Decreased	
M35/0646	BUCHANAN R.J. & S.R.	13.7	15	12	10	-1.810	8.190	6.552	1.638	0.000 ok	1470.1	0.149	0.149 ok	150	0	0	0.439	-0.289 Decreased	
M35/5608	Pheloung Investments Limited	15	15	13.5	11.5	-2.110	9.390	7.512	1.878	0.136 ok	1472.1	0.149	0.285 ok	150	0.12	0.12	0.290	-0.141 Decreased	
M35/9295	Smith C B	20.4	20.4	18.4	16.4	-4.170	12.230	9.784	2.446	0.834 ok	1473.0	0.149	0.983 ok	150	0.12	0.12	0.125	0.024 Increased	
M35/4740	CAMERON J G (EX WARD F.J)	0	15	12	10	-2.019	7.981	6.385	1.596	2.649 Exceeded	1488.1	0.147	2.796 Exceeded	150	0.12	0.12	0.683	-0.536 Decreased	
M35/0309	Keilyn Farms Limited	7.3	15	12	10	-1.790	8.210	6.568	1.642	2.005 Exceeded	1489.2	0.147	2.151 Exceeded	150	29.95	23.57	0.531	-0.385 Decreased	
M35/10129	Ohoka Park Truffiere limited	17.62	17.62	15.62	13.62	-2.230	11.390	9.112	2.278	0.173 ok	1492.9	0.146	0.319 ok	150	0.12	0.12	0.213	-0.067 Decreased	
M35/4238	Timperley Enterprises Limited	12.2	15	12	10	-3.840	6.160	4.928	1.232	2.339 Exceeded	1494.4	0.146	2.485 Exceeded	150	15	12.5	0.227	-0.082 Decreased	
M35/3247	VERKERK SETTLEMENT	9.1	15	12	10	-1.580	8.420	6.736	1.684	2.500 Exceeded	1497.4	0.145	2.646 Exceeded	150	0.12	0.12	1.102	-0.956 Decreased	
M35/4748	REID R.C.	9.1	15	12	10	-3.640	6.360	5.088	1.272	2.513 Exceeded	1506.1	0.144	2.657 Exceeded	150	0.12	0.12	0.275	-0.131 Decreased	
M35/8508	Timperley Investments Limited	29	29	14.5	12.5	-4.500	8.000	6.400	1.600	1.922 Exceeded	1521.7	0.142	2.064 Exceeded	150	23.96	20.24	0.249	-0.107 Decreased	
M35/8199	LAURIE CS & VC	24.6	24.6	22.6	20.6	-4.540	16.060	12.848	3.212	0.963 ok	1524.2	0.142	1.105 ok	150	0.12	0.12	0.115	0.027 Increased	
M35/10516	Mr & Mrs MD & NRJ Fairbrother	23	23	20.7	18.7	-4.610	14.090	11.272	2.818	0.705 ok	1534.4	0.141	0.845 ok	150	0.12	0.12	0.116	0.024 Increased	
M35/10530	Mr & Mrs CW & GN Singleton	24.13	24.13	22.13	20.13	-4.500	15.630	12.504	3.126	1.785 ok	1534.6	0.141	1.926 ok	150	0.12	0.12	0.151	-0.010 Decreased	
M35/2728	Mr H C & Mrs J A de Boer	12.2	15	12	10	-1.670	8.330	6.664	1.666	0.000 ok	1535.5	0.141	0.141 ok	150	0	0	0.537	-0.397 Decreased	
M35/5308	DORNABELL W.P. (EX SEELEN)	16.4	16.4	13.4	11.4	-2.420	8.980	7.184	1.796	0.314 ok	1536.3	0.1							

M35/6547	CLARK DG & EM	15	15	12	10	-1.870	8.130	6.504	1.626	0.000 ok	1571.8	0.136	0.136 ok	150	0.12	0.12	0.349	-0.214 Decreased
BW23/0590	Muhammad	24	24	22	20	-4.166	15.834	12.667	3.167	1.229 ok	1574.9	0.135	1.365 ok	150	0.12	0.12	0.107	0.028 Increased
M35/9592	Mr NA Harrison	21	21	18.89	16.89	-4.620	12.270	9.816	2.454	0.948 ok	1582.0	0.135	1.083 ok	150	0.12	0.12	0.107	0.028 Increased
M35/10130	Ohoka Park Truffiere limited	17.54	17.54	14.54	12.54	-2.200	10.340	8.272	2.068	0.156 ok	1587.2	0.134	0.290 ok	150	0.12	0.12	0.203	-0.069 Decreased
M35/8032	ALLAN DJ & ML	24	24	21	19	-4.660	14.340	11.472	2.868	0.819 ok	1593.1	0.133	0.952 ok	150	0.12	0.12	0.106	0.027 Increased
M35/4724	ALEXANDER	13.5	15	12	10	-1.450	8.550	6.840	1.710	0.439 ok	1593.8	0.133	0.572 ok	150	0	0	0.783	-0.650 Decreased
M35/8410	MR B M DAVEY	23.9	23.9	21.9	19.9	-3.750	16.150	12.920	3.230	0.133 ok	1603.7	0.132	0.265 ok	150	0.12	0.12	0.237	-0.105 Decreased
M35/4730	RUTHERFORD K.A.	12.1	15	12	10	-1.610	8.390	6.712	1.678	0.000 ok	1607.7	0.131	0.131 ok	150	0.12	0.12	0.543	-0.412 Decreased
M35/4723	ARMITAGE P.L.	0	15	12	10	-2.429	7.571	6.057	1.514	0.485 ok	1613.4	0.131	0.615 ok	150	0.12	0.12	0.819	-0.689 Decreased
M35/2919	RICHARDS M.E.	24.2	24.2	21.2	19.2	-4.190	15.010	12.008	3.002	0.168 ok	1620.3	0.130	0.297 ok	150	0.12	0.12	0.175	-0.045 Decreased
M35/5609	Waimakariri District Council	18.8	18.8	16.8	14.8	-1.480	13.320	10.656	2.664	1.466 ok	1621.1	0.130	1.595 ok	150	18	18	1.349	-1.219 Decreased
M35/3241	SANDERS E.W.& T.J.	24.2	24.2	21.2	19.2	-4.710	14.490	11.592	2.898	0.708 ok	1626.1	0.129	0.838 ok	150	0	0	0.102	0.027 Increased
M35/18806	Ariana C. & Geoffrey B. Wilkins	23	23	22	20	-4.151	15.849	12.679	3.170	0.933 ok	1644.3	0.127	1.060 ok	150	0.12	0.12	0.089	0.038 Increased
M35/7073	WALKER D.J.H. & C.M.	18.8	18.8	16.8	14.8	-1.530	13.270	10.616	2.654	0.106 ok	1644.9	0.127	0.233 ok	150	0.12	0.12	0.610	-0.483 Decreased
M35/8694	CHADDERTON DB	24	24	22	20	-4.670	15.330	12.264	3.066	0.961 ok	1648.6	0.127	1.087 ok	150	0.12	0.12	0.087	0.039 Increased
M35/6973	Mr J R Dunlop	19.7	19.7	17.14	15.14	-1.960	13.180	10.544	2.636	0.108 ok	1653.9	0.126	0.234 ok	150	2.31	2.12	0.274	-0.148 Decreased
M35/10536	Mr & Mrs GM & EA Painter	23.5	23.5	21.5	19.5	-4.750	14.750	11.800	2.950	0.703 ok	1654.0	0.126	0.829 ok	150	0.12	0.12	0.089	0.037 Increased
M35/2920	RICHARDS M.E.	10.6	15	12	10	-2.330	7.670	6.136	1.534	0.167 ok	1677.8	0.123	0.290 ok	150	0.12	0.12	0.155	-0.032 Decreased
BW24/0095	WICKLOW FARMING LTD	50	50	47	45	-2.466	42.534	34.027	8.507	1.924 ok	1678.1	0.320	2.244 ok	150	0.12	0.12	#N/A	#N/A
M35/9184	Osikai J & SK	23.6	23.6	21.6	19.6	-4.650	14.950	11.960	2.990	1.091 ok	1691.1	0.122	1.212 ok	150	0	0	0.082	0.039 Increased
M35/6268	A Verkerk Limited	12	15	12	10	-0.300	9.700	7.760	1.940	1.840 ok	1694.5	0.121	1.961 Exceeded	150	17.5	15.55	0.679	-0.558 Decreased
M35/8951	JD & K A McKenzie	18.05	18.05	16.05	14.05	-1.460	12.590	10.072	2.518	0.352 ok	1695.1	0.121	0.473 ok	150	0.12	0.12	0.653	-0.532 Decreased
BW23/0637	Dale Powers	24.23	24.23	22.73	20.73	-4.223	16.507	13.206	3.301	0.711 ok	1697.2	0.121	0.832 ok	150	0.12	0.12	0.083	0.037 Increased
M35/9257	Mr M D & Mrs N E Wilkinson	18	18	16.5	14.5	-1.360	13.140	10.512	2.628	0.000 ok	1715.0	0.119	0.119 ok	150	0.12	0.12	0.428	-0.309 Decreased
M35/4722	Wicklow Farming Limited	12	15	12	10	-1.530	8.470	6.776	1.694	1.696 Exceeded	1717.7	0.119	1.815 Exceeded	150	22.57	22.57	1.002	-0.884 Decreased
M35/4239	Timperley Enterprises Limited	12.3	15	12	10	-4.160	5.840	4.672	1.168	1.498 Exceeded	1718.6	0.118	1.617 Exceeded	150	31	25.83	0.145	-0.027 Decreased
M35/0388	WALLS G.D.	0	15	12	10	-2.338	7.662	6.129	1.532	1.823 Exceeded	1723.5	0.118	1.941 Exceeded	150	0.12	0.12	1.298	-1.181 Decreased
M35/18131	MR JG & MRS S J VAN T VEEN	23.5	23.5	22.81	20.81	-4.760	16.050	12.840	3.210	0.351 ok	1727.0	0.117	0.468 ok	150	0.12	0.12	0.102	0.015 Increased
M35/0387	REGNAULT C.R.	6	15	12	10	-1.500	8.500	6.800	1.700	2.451 Exceeded	1734.1	0.117	2.567 Exceeded	150	0.12	0.12	1.087	-0.970 Decreased
M35/9631	MR & MRS SH & SJ TAYLOR	27	27	25	23	-4.750	18.250	14.600	3.650	0.968 ok	1734.6	0.117	1.085 ok	150	0.12	0.12	0.078	0.039 Increased
M35/4747	LESLIE D.H.& M.A.	5.4	15	12	10	-1.400	8.600	6.880	1.720	1.508 ok	1735.6	0.116	1.624 ok	150	0.12	0.12	1.540	-1.424 Decreased
M35/8409	ARCHIBALD TR	23.2	23.2	22.2	20.2	-3.430	16.770	13.416	3.354	0.234 ok	1740.5	0.116	0.350 ok	150	0.12	0.12	0.207	-0.091 Decreased
M35/0326	Mr & Mrs P J & R J Sherriff	13.7	15	12	10	-1.390	8.610	6.888	1.722	1.403 ok	1741.1	0.116	1.519 ok	150	0	0	0.665	-0.550 Decreased
M35/6830	Mr R J Fife and D J Jamieson	13.9	15	12	10	-1.750	8.250	6.600	1.650	0.000 ok	1745.1	0.115	0.115 ok	150	0.12	0.12	0.347	-0.232 Decreased
M35/6895	RICHARDS M.E.	20	20	17	15	-2.370	12.630	10.104	2.526	0.163 ok	1745.9	0.115	0.279 ok	150	0.12	0.12	0.139	-0.023 Decreased
M35/0593	SANDERS E.W.& T.J.	9.1	15	12	10	-3.370	6.630	5.304	1.326	1.088 ok	1747.5	0.115	1.203 ok	150	0.12	0.12	0.076	0.039 Increased
M35/9199	GS & B A COATES	23.68	23.68	21.66	19.66	-4.850	14.810	11.848	2.962	0.823 ok	1753.0	0.115	0.938 ok	150	0.12	0.12	0.077	0.037 Increased
M35/4719	POWER G.J.	8.5	15	12	10	-1.590	8.410	6.728	1.682	2.510 Exceeded	1757.7	0.114	2.624 Exceeded	150	0.12	0.12	0.665	-0.551 Decreased
M35/9876	Mr & Ms M C & P J Maxwell & Duffield	20.48	20.48	18.48	16.48	-4.720	11.760	9.408	2.352	1.096 ok	1765.3	0.113	1.209 ok	150	0.12	0.12	0.074	0.039 Increased
M35/7754	WILKINSON PB	24	24	23	21	-3.720	17.280	13.824	3.456	0.476 ok	1765.9	0.113	0.589 ok	150	0.12	0.12	0.750	-0.637 Decreased
M35/7998	SHIINO Y & Y	26	26	24.5	22.5	-4.870	17.630	14.104	3.526	0.483 ok	1767.2	0.113	0.596 ok	150	0.12	0.12	0.082	0.032 Increased
BW24/0262	Waimakariri District Council	84.7	84.7	78	76	-2.368	73.632	58.905	14.726	0.000 ok	1770.5	0.281	0.281 ok	150	18	18	#N/A	#N/A
M35/7288	POLSON AH DR	12	15	12	10	-1.840	8.160	6.528	1.632	0.000 ok	1772.7	0.112	0.112 ok	150	0.12	0.12	0.293	-0.180 Decreased
M35/9946	Mr & Mrs RA & M R Jacobs	20.74	20.74	18.74	16.74	-4.830	11.910	9.528	2.382	0.848 ok	1773.0	0.112	0.960 ok	150	0.12	0.12	0.074	0.038 Increased
M35/9812	MR A K CUSSONS	23.83	23.83	21.83	19.83	-4.810	15.020	12.016	3.004	0.965 ok	1777.0	0.112	1.077 ok	150	0.12	0.12	0.073	0.038 Increased
M35/5300	SEED S.L. & M.	15.7	15.7	12.7	10.7	-2.700	8.000	6.400	1.600	0.366 ok	1788.0	0.111	0.477 ok	150	0.12	0.12	0.083	0.028 Increased
M35/4680	ABBOTT W.E.L.	16.7	16.7	13.7	11.7	-3.520	8.180	6.544	1.636	1.045 ok	1791.6	0.110	1.156 ok	150	0.12	0.12	0.072	0.038 Increased
M35/4785	THACKWELL G.M.	6.1	15	12	10	-1.440	8.560	6.848	1.712	1.864 Exceeded	1792.5	0.110	1.974 Exceeded	150	0.12	0.12	1.162	-1.051 Decreased
M35/4788	WRAPSON J.	0	15	12	10	-2.341	7.659	6.127	1.532	1.864 Exceeded	1792.5	0.110	1.974 Exceeded	150	0.12	0.12	1.162	-1.051 Decreased
M35/0351	Keilyn Farms Limited	11.4	15	12	10	-3.250	6.750	5.400	1.350	1.784 Exceeded	1796.8	0.110	1.893 Exceeded	150	29.95	23.57	0.282	-0.172 Decreased
M35/6468	Mr & Mrs AT & J R Cox	19.3	19.3	16.3	14.3	-2.540	11.760	9.408	2.352	0.323 ok	1806.9	0.109	0.432 ok	150	2.9	2.35	0.087	0.022 Increased
M35/9600	MR & MRS J D & K A MCKENZIE	17.53	17.53	15.53	13.53	-1.410	12.120	9.696	2.424	0.361 ok	1812.3	0.108	0.469 ok	150	0.12	0.12	0.617	-0.508 Decreased
M35/4782	BISMAN I.W.	20.4	20.4	20.4	18.4	-4.150	14.250	11.400	2.850	1.443 ok	1815.7	0.108	1.551 ok	150	0.12	0.12	1.399	-1.292 Decreased
BW23/0702	Jacque & Daryl Bloomfield	25.5	25.5	24	22	-4.524	17.476	13.981	3.495	1.095 ok	1827.9	0.107	1.202 ok	150	0.12	0.12	0.068	0.038 Increased
M35/9698	Ohoka Utilities Limited	27.15	27.15	24.15	22.15	-4.110	18.040	14.432	3.608	0.869 ok	1837.3	0.106	0.975 ok	150	7	7	0.061	0.045 Increased
M35/3072	Dr T B Taylor	19	19	16	14	-2.480	11.520	9.216	2.304	0.281 ok	1837.4	0.106	0.387 ok	150	2	2	0.101	0.004 Increased
BW24/0539	Brian and Agnes McIntock	18	18	16	14	-2.445	11.555	9.244	2.311	0.000 ok	1839.4	0.105	0.105 ok	150	0.12	0.12	0.474	-0.368 Decreased
M35/9258	Mr M D & Mrs N E Wilkinson	18	18	16.5	14.5	-1.340	13.160	10.528	2.632	0.000 ok	1844.7	0.105	0.105 ok	150	0.12	0.12	0.372	-0.268 Decreased
BW24/0057	MR & MRS T & K KOMAI	18	18	16.49	14.49	-3.267	11.223	8.979	2.245	0.234 ok	1848.4	0.105	0.339 ok	150	0.12	0.12	0.164	-0.060 Decreased
M35/0696	MULLIGAN P.R.R.	6.1	15	12	10	-2.040	7.960	6.368	1.592	0.239 ok	1853.6	0.104	0.343 ok	150	0.12	0.12	0.196	-0.092 Decreased
M35/4770	DELOW P.K.	0	15	12	10	-2.339	7.661	6.129	1.532	1.828 Exceeded	1864.3	0.103	1.931 Exceeded	150	0.12	0.12	1.031	-0.928 Decreased

M35/4377		11.5	15	12	10	-2.450	7.550	6.040	1.510	0.261 ok	1864.9	0.103	0.364 ok	150	0.12	0.12	0.102	0.001 Increased	
M35/0386	LESLIE D.H. & M.A.	4	15	12	10	-1.380	8.620	6.896	1.724	1.506 ok	1876.0	0.102	1.608 ok	150	0.12	0.12	1.195	-1.093 Decreased	
M35/6894	RICHARDS M.E.	20	20	17	15	-2.350	12.650	10.120	2.530	0.143 ok	1878.9	0.101	0.244 ok	150	0.12	0.12	0.125	-0.023 Decreased	
M35/9599	Mr & Mrs G.J & T.A Burbery	17.4	17.4	15.4	13.4	-1.370	12.030	9.624	2.406	0.370 ok	1880.5	0.101	0.471 ok	150	0.12	0.12	0.602	-0.501 Decreased	
M35/9983	Mr & Mrs MA & MJ Prosser	23.95	23.95	19.95	17.95	-3.980	13.970	11.176	2.794	0.000 ok	1880.9	0.101	0.101 ok	150	0.12	0.12	0.394	-0.293 Decreased	
M35/0320	OFFWOOD D.	9.1	15	12	10	-1.310	8.690	6.952	1.738	0.903 ok	1881.6	0.101	1.004 ok	150	0.12	0.12	0.950	-0.849 Decreased	
M35/9398	MR D A BOARD & MS S A HODGES-BOARD	17.8	17.8	15.78	13.78	-3.570	10.210	8.168	2.042	1.022 ok	1881.9	0.101	1.123 ok	150	0.12	0.12	0.054	0.047 Increased	
M35/5988	SEED SL & M	15	15	14	12	-2.740	9.260	7.408	1.852	0.378 ok	1885.0	0.101	0.479 ok	150	0.12	0.12	0.073	0.028 Increased	
BW23/0667	J Catlin	24	24	22.1	20.1	-4.453	15.647	12.518	3.129	1.047 ok	1887.0	0.101	1.148 ok	150	0.12	0.12	0.055	0.046 Increased	
M35/7113	CLEMENTS K.S.	17.7	17.7	15	13	-2.000	11.000	8.800	2.200	0.121 ok	1888.6	0.100	0.221 ok	150	0.12	0.12	0.200	-0.100 Decreased	
M35/10445	Mr & Ms I & M Willetts	42	42	39	37	-2.780	34.220	27.376	6.844	0.345 ok	1891.0	0.238	0.584 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/9637	MR & MRS D J & K A MCKENZIE	17.6	17.6	15.1	13.1	-1.440	11.660	9.328	2.332	0.000 ok	1892.4	0.100	0.100 ok	150	0.12	0.12	0.501	-0.401 Decreased	
M35/17863	MR & MRS R A & Y M EDWARDS	24	24	22	20	-3.720	16.280	13.024	3.256	0.776 ok	1897.9	0.000	0.776 ok	0	0.12	0.12	0.062	-0.062 Decreased	
M35/0617	Mr & Mrs PW & G A Kimber	13.1	15	12	10	-2.240	7.760	6.208	1.552	0.127 ok	1899.9	0.000	0.127 ok	0	0.9	0.52	0.141	-0.141 Decreased	
M35/8480	Mr & Mrs R & S Wix	24	24	22.5	20.5	-4.750	15.750	12.600	3.150	0.550 ok	1909.2	0.000	0.550 ok	0	2.34	2.14	0.065	-0.065 Decreased	
BW23/0693		24	24	22.1	20.1	-4.473	15.627	12.502	3.125	1.022 ok	1913.6	0.000	1.022 ok	0	0.12	0.12	0.052	-0.052 Decreased	
M35/9916	Mr & Mrs DL & SM Scott	24	24	18	16	-4.230	11.770	9.416	2.354	0.147 ok	1916.9	0.000	0.147 ok	0	0.12	0.12	0.099	-0.099 Decreased	
M35/10177	Mr PRR Mulligan	17.9	17.9	16.4	14.4	-1.730	12.670	10.136	2.534	0.146 ok	1929.0	0.000	0.146 ok	0	0.12	0.12	0.183	-0.183 Decreased	
M35/10472	Mr & Mrs KM & DA Arthur	24	24	23	21	-3.700	17.300	13.840	3.460	0.290 ok	1938.2	0.000	0.290 ok	0	0.12	0.12	0.168	-0.168 Decreased	
M35/5309	DEAN E.M.	20.4	20.4	17.4	15.4	-4.900	10.500	8.400	2.100	0.309 ok	1940.2	0.000	0.309 ok	0	0.12	0.12	0.074	-0.074 Decreased	
M35/4679	SOUTHERN CHICKS LTD.	0	15	12	10	-4.239	5.761	4.609	1.152	0.892 ok	1941.5	0.000	0.892 ok	0	0.12	0.12	0.058	-0.058 Decreased	
BW23/0407	S Boot	23.5	23.5	22	20	-4.161	15.839	12.672	3.168	1.019 ok	1942.8	0.000	1.019 ok	0	0.12	0.12	0.059	-0.059 Decreased	
BW23/0707	SteveBlackler	150	150	22	20	-4.473	15.527	12.422	3.105	0.648 ok	1946.4	0.221	0.870 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/8311	HENDREN LP & GJ	18	18	16.5	14.5	-1.920	12.580	10.064	2.516	0.118 ok	1960.8	0.000	0.118 ok	0	0.12	0.12	0.135	-0.135 Decreased	
BW23/0666	L Buckley	24	24	22.1	20.1	-4.491	15.609	12.488	3.122	0.916 ok	1967.1	0.000	0.916 ok	0	0.12	0.12	0.048	-0.048 Decreased	
M35/7533	LYALL T.M	6	15	12	10	-1.310	8.690	6.952	1.738	1.100 ok	1970.6	0.000	1.100 ok	0	0	0	0.967	-0.967 Decreased	
M35/4789	MURRAY IMPLEMENTS	13.7	15	12	10	-1.310	8.690	6.952	1.738	1.110 ok	1981.3	0.000	1.110 ok	0	0.12	0.12	0.962	-0.962 Decreased	
M35/6893	RICHARDS M.E.	20	20	17	15	-2.320	12.680	10.144	2.536	0.127 ok	1982.8	0.000	0.127 ok	0	0.12	0.12	0.117	-0.117 Decreased	
M35/9995	Mr SD Syme	23.56	23.56	21.56	19.56	-4.660	14.900	11.920	2.980	0.935 ok	1983.6	0.000	0.935 ok	0	0.12	0.12	0.046	-0.046 Decreased	
M35/9638	MR & MRS D J & K A MCKENZIE	17.82	17.82	15.32	13.32	-1.380	11.940	9.552	2.388	0.104 ok	1984.2	0.000	0.104 ok	0	0.12	0.12	0.493	-0.493 Decreased	
M35/5147	BOULTON I.W.	12	15	12	10	-1.350	8.650	6.920	1.730	1.277 ok	1985.6	0.000	1.277 ok	0	0.12	0.12	1.000	-1.000 Decreased	
BW23/0411	Blair Tipler	24.2	24.2	22.7	20.7	-4.469	16.231	12.985	3.246	0.822 ok	1988.1	0.000	0.822 ok	0	0.12	0.12	0.052	-0.052 Decreased	
BW24/0575	Greg Holland	18	18	16	14	-2.446	11.554	9.243	2.311	0.000 ok	1995.7	0.000	0.000 ok	0	0.12	0.12	0.349	-0.349 Decreased	
M35/0390	Mr P PASTARS	7	15	12	10	-4.020	5.980	4.784	1.196	2.086 Exceeded	1998.9	0.000	2.086 Exceeded	0	0.12	0.12	0.138	-0.138 Decreased	
M35/5677	K & D Taane	95.2	95.2	92.2	90.2	-4.260	85.940	68.752	17.188	0.893 ok	1999.6	0.206	1.099 ok	150	0.12	0.12	#N/A	#N/A	#N/A

Input file used Bore Location 2.prn

Model Parameters for drawdown calculations
 Standard Screen Length :3m
 Standard Pump Length :2m
 Depth Range of pumped Aquifer taken from 31m till 999m
 Transmissivity 115 m2/d
 Storativity 0.00063
 Leakage 660 OR 0.0003 KB
 Sigma 0.1
 T0 975 m2/d

WellNo	Owner	Depth	AdoptDepth	Top_Screen	CutOff	Calc80Min	Available	Protected	DD4Interference	CumDD	OkCumDD	VIR/0001_Dist	VIR/0001_DDA	VIR/0001_DD	VIR/0001_DDOK	VIR/0001_DomP	Q7	Q150	ExistingDD	Change	Result
VIR/0001		84	84	81	79	-1.923	77.077	61.661	15.415	0.844	ok	0.0	0.000	0.844	ok	0	28.96	28.96	#N/A	#N/A	#N/A
M35/4723	ARMITAGE P.L.	0	15	12	10	-1.934	8.066	6.453	1.613	0.485	ok	241.8	0.371	0.856	ok	150	0.12	0.12	0.819	-0.448	Decreased
M35/7754	WILKINSON PB	24	24	23	21	-3.720	17.280	13.824	3.456	0.476	ok	257.0	0.368	0.845	ok	150	0.12	0.12	0.750	-0.381	Decreased
M35/0320	OFFWOOD D.	9.1	15	12	10	-1.310	8.690	6.952	1.738	0.903	ok	308.0	0.359	1.262	ok	150	0.12	0.12	0.950	-0.591	Decreased
M35/4724	ALEXANDER	13.5	15	12	10	-1.450	8.550	6.840	1.710	0.439	ok	339.8	0.353	0.792	ok	150	0	0	0.783	-0.430	Decreased
M35/0326	Mr & Mrs P J & R J Sherriff	13.7	15	12	10	-1.390	8.610	6.888	1.722	1.403	ok	434.6	0.335	1.738	Exceeded	150	0	0	0.665	-0.331	Decreased
M35/0389	EYRE C.C.	0	15	12	10	-1.801	8.199	6.559	1.640	0.690	ok	444.6	0.333	1.023	ok	150	0	0	0.735	-0.402	Decreased
M35/4792	OLSEN M.	9.1	15	12	10	-1.250	8.750	7.000	1.750	0.690	ok	444.6	0.333	1.023	ok	150	0.12	0.12	0.735	-0.402	Decreased
M35/5133	MARSHALL J.J.	20	20	17	15	-1.260	13.740	10.992	2.748	0.433	ok	458.3	0.330	0.763	ok	150	0.12	0.12	0.608	-0.278	Decreased
M35/4782	BISMAN I.W.	20.4	20.4	20.4	18.4	-4.150	14.250	11.400	2.850	1.443	ok	467.0	0.328	1.771	ok	150	0.12	0.12	1.399	-1.071	Decreased
BW24/0216	Ohoka Service Station 1992 Limited	4	15	12	10	-1.869	8.131	6.505	1.626	0.800	ok	468.5	0.328	1.127	ok	150	0	0	0.845	-0.517	Decreased
BW24/0218	Ohoka Service Station 1992 Limited	4	15	12	10	-1.860	8.140	6.512	1.628	0.784	ok	471.5	0.327	1.111	ok	150	0	0	0.822	-0.495	Decreased
M35/7533	LYALL T.M	6	15	12	10	-1.310	8.690	6.952	1.738	1.100	ok	471.9	0.327	1.427	ok	150	0	0	0.967	-0.640	Decreased
BW24/0217	Ohoka Service Station 1992 Limited	4	15	12	10	-1.855	8.145	6.516	1.629	0.778	ok	477.4	0.326	1.104	ok	150	0	0	0.811	-0.485	Decreased
M35/9599	Mr & Mrs G.J. & T.A. Burbery	17.4	17.4	15.4	13.4	-1.370	12.030	9.624	2.406	0.370	ok	482.3	0.325	0.695	ok	150	0.12	0.12	0.602	-0.277	Decreased
M35/4747	LESLIE D.H. & M.A.	5.4	15	12	10	-1.400	8.600	6.880	1.720	1.508	ok	486.5	0.324	1.832	Exceeded	150	0.12	0.12	1.540	-1.216	Decreased
M35/4789	MURRAY IMPLEMENTS	13.7	15	12	10	-1.310	8.690	6.952	1.738	1.110	ok	490.8	0.323	1.433	ok	150	0.12	0.12	0.962	-0.638	Decreased
BW24/0215	Ohoka Service Station 1992 Limited	4	15	12	10	-1.841	8.159	6.528	1.632	0.786	ok	493.6	0.323	1.109	ok	150	0	0	0.810	-0.487	Decreased
M35/9600	MR & MRS J D & K A MCKENZIE	17.53	17.53	15.53	13.53	-1.410	12.120	9.696	2.424	0.361	ok	496.4	0.322	0.683	ok	150	0.12	0.12	0.617	-0.294	Decreased
M35/6181	WALKER D.J.	12	15	12	10	-1.560	8.440	6.752	1.688	0.417	ok	499.7	0.321	0.738	ok	150	0.12	0.12	0.909	-0.588	Decreased
BW24/0219	Ohoka Service Station 1992 Limited	4	15	12	10	-1.829	8.171	6.537	1.634	0.775	ok	505.4	0.320	1.095	ok	150	0	0	0.788	-0.468	Decreased
M35/10520	Mr & Mrs RW & HI Southam	17.9	17.9	15.9	13.9	-1.220	12.680	10.144	2.536	0.433	ok	519.0	0.318	0.750	ok	150	0.12	0.12	0.582	-0.264	Decreased
M35/8951	J D & K A McKenzie	18.05	18.05	16.05	14.05	-1.460	12.590	10.072	2.518	0.352	ok	525.7	0.316	0.668	ok	150	0.12	0.12	0.653	-0.336	Decreased
M35/4790	WALLS C.A.S.	10.2	15	12	10	-1.290	8.710	6.968	1.742	0.827	ok	531.3	0.315	1.142	ok	150	0.12	0.12	0.832	-0.517	Decreased
M35/4794	HEATLEY K.	6.1	15	12	10	-1.290	8.710	6.968	1.742	0.827	ok	531.3	0.315	1.142	ok	150	0.12	0.12	0.832	-0.517	Decreased
M35/4841	MAUNSELL R. & J.L.	6.1	15	12	10	-1.290	8.710	6.968	1.742	0.827	ok	531.3	0.315	1.142	ok	150	0.12	0.12	0.832	-0.517	Decreased
M35/5134	MURRAY IMPLEMENTS CO.	0	15	12	10	-1.889	8.111	6.489	1.622	1.132	ok	538.4	0.314	1.445	ok	150	0.12	0.12	0.942	-0.628	Decreased
BW24/0520	Tim Baker	11.22	15	12	10	-1.846	8.154	6.523	1.631	0.953	ok	561.4	0.309	1.262	ok	150	0.12	0.12	0.839	-0.531	Decreased
M35/0386	LESLIE D.H. & M.A.	4	15	12	10	-1.380	8.620	6.896	1.724	1.506	ok	566.6	0.308	1.814	Exceeded	150	0.12	0.12	1.195	-0.887	Decreased
M35/4795	WaterForce Rangiora	13.8	15	12	10	-1.140	8.860	7.088	1.772	1.152	ok	573.2	0.306	1.459	ok	150	0.12	0.12	0.930	-0.623	Decreased
M35/4879	MCQUILLAN R.	13.7	15	12	10	-1.190	8.810	7.048	1.762	0.562	ok	580.9	0.305	0.867	ok	150	0.12	0.12	0.569	-0.264	Decreased
M35/0385	FLINTOFT W.L.	6.5	15	12	10	-1.260	8.740	6.992	1.748	0.769	ok	586.2	0.304	1.073	ok	150	0.12	0.12	0.728	-0.424	Decreased
M35/9598	MR & MRS J D & K A MCKENZIE	17.28	17.28	15.28	13.28	-1.310	11.970	9.576	2.394	0.333	ok	608.9	0.299	0.632	ok	150	0.12	0.12	0.509	-0.210	Decreased
M35/9601	MR & MRS J D & K A MCKENZIE	23.5	23.5	21.5	19.5	-4.010	15.490	12.392	3.098	0.333	ok	608.9	0.299	0.632	ok	150	0.12	0.12	0.509	-0.210	Decreased
M35/0388	WALLS G.D.	0	15	12	10	-2.073	7.927	6.341	1.585	1.823	Exceeded	615.0	0.298	2.121	Exceeded	150	0.12	0.12	1.298	-1.001	Decreased
M35/5147	BOULTON I.W.	12	15	12	10	-1.350	8.650	6.920	1.730	1.277	ok	617.6	0.297	1.575	ok	150	0.12	0.12	1.000	-0.703	Decreased
M35/8112	Walker DIH and CM	20.25	20.25	18.25	16.25	-3.970	12.280	9.824	2.456	0.331	ok	647.2	0.291	0.622	ok	150	0.12	0.12	0.744	-0.452	Decreased
M35/4744	ARMSTRONG M.A. & G.G.	0	15	12	10	-1.688	8.312	6.649	1.662	0.718	ok	652.0	0.290	1.008	ok	150	0.12	0.12	0.640	-0.350	Decreased
M35/7701	HJ SMITH	86	86	84	82	-0.980	81.020	64.816	16.204	0.934	ok	678.7	1.605	2.540	ok	150	0.12	0.12	#N/A	#N/A	#N/A
BW24/0364	Gabe Rijpma	14.1	15	12	10	-1.834	8.166	6.533	1.633	0.870	ok	681.8	0.284	1.154	ok	150	0.12	0.12	0.767	-0.482	Decreased
M35/9638	MR & MRS D J & K A MCKENZIE	17.82	17.82	15.32	13.32	-1.380	11.940	9.552	2.388	0.104	ok	687.8	0.283	0.387	ok	150	0.12	0.12	0.493	-0.210	Decreased
M35/3306	Merv Emms	17	17	14	12	-1.580	10.420	8.336	2.084	0.348	ok	692.6	0.282	0.630	ok	150	3	3	0.926	-0.644	Decreased
M35/7073	WALKER D.J.H. & C.M.	18.8	18.8	16.8	14.8	-1.530	13.270	10.616	2.654	0.106	ok	706.5	0.279	0.385	ok	150	0.12	0.12	0.610	-0.331	Decreased
M35/4785	THACKWELL G.M.	6.1	15	12	10	-1.440	8.560	6.848	1.712	1.864	Exceeded	708.0	0.279	2.143	Exceeded	150	0.12	0.12	1.162	-0.882	Decreased
M35/4788	WRAPSON J.	0	15	12	10	-2.079	7.921	6.337	1.584	1.864	Exceeded	708.0	0.279	2.143	Exceeded	150	0.12	0.12	1.162	-0.882	Decreased
M35/5609	Waimakariri District Council	18.8	18.8	16.8	14.8	-1.480	13.320	10.656	2.664	1.466	ok	719.6	0.277	1.742	ok	150	18	18	1.349	-1.072	Decreased
M35/0367	Mr & Mrs P J & R J Sherriff	9.4	15	12	10	-1.480	8.520	6.816	1.704	2.091	Exceeded	737.1	0.273	2.364	Exceeded	150	0	0	0.771	-0.498	Decreased
M35/9637	MR & MRS D J & K A MCKENZIE	17.6	17.6	15.1	13.1	-1.440	11.660	9.328	2.332	0.000	ok	738.5	0.273	0.273	ok	150	0.12	0.12	0.501	-0.228	Decreased
M35/0305	LESLIE D.H. & M.A.	5.8	15	12	10	-1.550	8.450	6.760	1.690	1.924	Exceeded	739.4	0.273	2.197	Exceeded	150	0.12	0.12	1.416	-1.143	Decreased
M35/8399	LYNN RJ	10.5	15	12	10	-1.240	8.760	7.008	1.752	0.771	ok	746.3	0.271	1.042	ok	150	0.12	0.12	0.627	-0.356	Decreased
M35/4743	ARMSTRONG M.A. & G.G.	13.7	15	12	10	-1.170	8.830	7.064	1.766	0.593	ok	751.6	0.270	0.863	ok	150	0.12	0.12	0.506	-0.236	Decreased
M35/4745	ARMSTRONG M.A. & G.G.	0	15	12	10	-1.979	8.021	6.417	1.604	1.537	ok	766.2	0.267	1.805	Exceeded	150	0.12	0.12	0.928	-0.660	Decreased
BW24/0262	Waimakariri District Council	84.7	84.7	78	76	-2.105	73.895	59.116	14.779	0.000	ok	767.3	1.358	1.358	ok	150	18	18	#N/A	#N/A	#N/A
M35/3042	EYRE C.C.	6.1	15	12	10	-1.130	8.870	7.096	1.774	0.486	ok	774.8	0.266	0.752	ok	150	0	0	0.448	-0.182	Decreased

M35/9071	Watson A A	12	15	12	10	-0.900	9.100	7.280	1.820	0.797 ok	786.5	0.263	1.061 ok	150	0	0	0.547	-0.283 Decreased	
M35/9423	Mr & Mrs P J & R J Sherriff	30	30	27	25	-2.066	22.934	18.347	4.587	0.351 ok	788.2	0.263	0.614 ok	150	0	0	0.645	-0.382 Decreased	
M35/8381	Marilyn Brown	88	88	86.5	84.5	-1.040	83.460	66.768	16.692	1.196 ok	801.4	1.276	2.472 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/4770	DELLLOW P.K.	0	15	12	10	-2.086	7.914	6.331	1.583	1.828 Exceeded	802.7	0.260	2.089 Exceeded	150	0.12	0.12	1.031	-0.770 Decreased	
M35/18188	MR M P EMMS	18	18	16.86	14.86	-1.240	13.620	10.896	2.724	0.101 ok	830.6	0.255	0.356 ok	150	0.12	0.12	0.724	-0.469 Decreased	
M35/9639	MR & MRS D J & K A MCKENZIE	17.5	17.5	15	13	-1.380	11.620	9.296	2.324	0.000 ok	836.0	0.254	0.254 ok	150	0.12	0.12	0.419	-0.165 Decreased	
M35/3032	Kate Mullins	19.7	19.7	16.7	14.7	-1.690	13.010	10.408	2.602	0.208 ok	857.9	0.250	0.458 ok	150	0.12	0.12	0.867	-0.618 Decreased	
M35/11074	MACRAE LAND COMPANY	17	17	15.5	13.5	-0.830	12.670	10.136	2.534	0.650 ok	865.0	0.248	0.898 ok	150	0.12	0.12	0.435	-0.187 Decreased	
BW24/0539	Brian and Agnes McIntock	18	18	16	14	-1.720	12.280	9.824	2.456	0.000 ok	877.0	0.246	0.246 ok	150	0.12	0.12	0.474	-0.228 Decreased	
M35/4717	IRELAND W.P. & F.W.	9.1	15	12	10	-1.320	8.680	6.944	1.736	1.167 ok	879.1	0.246	1.413 ok	150	0.12	0.12	0.708	-0.463 Decreased	
M35/0387	REGNAULT C.R.	6	15	12	10	-1.500	8.500	6.800	1.700	2.451 Exceeded	884.0	0.245	2.695 Exceeded	150	0.12	0.12	1.087	-0.842 Decreased	
M35/4746	VERKERK A.	9.1	15	12	10	-1.610	8.390	6.712	1.678	2.062 Exceeded	918.6	0.238	2.300 Exceeded	150	0.12	0.12	1.240	-1.002 Decreased	
M35/9640	MR & MRS D J & K A MCKENZIE	16.47	16.47	14.47	12.47	-1.330	11.140	8.912	2.228	0.000 ok	919.1	0.238	0.238 ok	150	0.12	0.12	0.368	-0.130 Decreased	
M35/9636	RJ & AR North	17.82	17.82	15.82	13.82	-1.260	12.560	10.048	2.512	0.000 ok	933.5	0.235	0.235 ok	150	0.12	0.12	0.350	-0.115 Decreased	
M35/4730	RUTHERFORD K.A.	12.1	15	12	10	-1.610	8.390	6.712	1.678	0.000 ok	936.7	0.235	0.235 ok	150	0.12	0.12	0.543	-0.309 Decreased	
M35/9602	MR & MRS J D & K A MCKENZIE	17.4	17.4	15.4	13.4	-1.170	12.230	9.784	2.446	0.000 ok	962.7	0.230	0.230 ok	150	0.12	0.12	0.335	-0.105 Decreased	
M35/4772	Robin Ames	0	15	12	10	-1.961	8.039	6.431	1.608	0.000 ok	988.3	0.225	0.225 ok	150	0.12	0.12	0.801	-0.575 Decreased	
M35/0596	Canterbury Regional Council	2.9	15	12	10	-0.750	9.250	7.400	1.850	1.624 ok	988.5	0.225	1.849 ok	150	0.12	0.12	1.357	-1.131 Decreased	
M35/4554	A Verkerk Limited	7.5	15	12	10	-1.600	8.400	6.720	1.680	1.927 Exceeded	989.7	0.225	2.152 Exceeded	150	11.88	11.88	1.167	-0.942 Decreased	
M35/4722	Wicklow Farming Limited	12	15	12	10	-1.530	8.470	6.776	1.694	1.696 Exceeded	993.2	0.224	1.921 Exceeded	150	22.57	22.57	1.002	-0.778 Decreased	
M35/11075	MACRAE LAND COMPANY	20	20	17	15	-1.070	13.930	11.144	2.786	0.432 ok	995.3	0.224	0.656 ok	150	0.12	0.12	0.344	-0.120 Decreased	
M35/7909	MOORE EH	20	20	17	15	-1.440	13.560	10.848	2.712	1.759 ok	1007.3	0.222	1.981 ok	150	0.12	0.12	0.802	-0.580 Decreased	
M35/3247	VERKERK SETTLEMENT	9.1	15	12	10	-1.580	8.420	6.736	1.684	2.500 Exceeded	1010.6	0.221	2.721 Exceeded	150	0.12	0.12	1.102	-0.881 Decreased	
M35/3019	MacRae Land Company Limited	15.4	15.4	12.4	10.4	-1.060	9.340	7.472	1.868	0.325 ok	1011.7	0.221	0.546 ok	150	0	0	0.333	-0.112 Decreased	
M35/2728	Mr H C & Mrs J A de Boer	12.2	15	12	10	-1.670	8.330	6.664	1.666	0.000 ok	1035.9	0.217	0.217 ok	150	0	0	0.537	-0.321 Decreased	
M35/4720	MOORE E.H.	5.4	15	12	10	-1.350	8.650	6.920	1.730	1.171 ok	1046.8	0.215	1.386 ok	150	0.12	0.12	0.628	-0.414 Decreased	
M35/3066	MASON W.I.G.	6.7	15	12	10	-1.720	8.280	6.624	1.656	1.464 ok	1051.7	0.214	1.678 Exceeded	150	0.12	0.12	1.612	-1.398 Decreased	
BW24/0552	Benn & Amy Mathieson	20	20	18	16	-1.901	14.099	11.279	2.820	1.034 ok	1053.8	0.214	1.247 ok	150	0.12	0.12	0.485	-0.271 Decreased	
M35/4726	MARSHALL J.J.	5.7	15	12	10	-1.090	8.910	7.128	1.782	0.116 ok	1056.6	0.213	0.329 ok	150	0.12	0.12	0.304	-0.091 Decreased	
M35/9641	MR & MRS D J & K A MCKENZIE	16.05	16.05	14.05	12.05	-1.310	10.740	8.592	2.148	0.000 ok	1057.8	0.213	0.213 ok	150	0.12	0.12	0.311	-0.098 Decreased	
BW24/0624	Sam Jury	18	18	16	14	-1.875	12.125	9.700	2.425	1.035 ok	1058.3	0.213	1.248 ok	150	0.12	0.12	0.471	-0.258 Decreased	
M35/9633	MR & MRS D J & K A MCKENZIE	17.55	17.55	15.55	13.55	-1.460	12.090	9.672	2.418	0.000 ok	1062.7	0.212	0.212 ok	150	0.12	0.12	0.355	-0.142 Decreased	
BW24/0095	WICKLOW FARMING LTD	50	50	47	45	-2.247	42.753	34.202	8.551	1.924 ok	1067.6	0.806	2.731 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/9632	MR & MRS D J & K A MCKENZIE	17.37	17.37	15.37	13.37	-1.490	11.880	9.504	2.376	0.000 ok	1067.7	0.211	0.211 ok	150	0.12	0.12	0.365	-0.154 Decreased	
M35/11077	MACRAE LAND COMPANY	18	18	16.5	14.5	-0.740	13.760	11.008	2.752	0.330 ok	1072.4	0.210	0.541 ok	150	0.12	0.12	0.308	-0.097 Decreased	
BW24/0529	Jarrad Allen	18	18	16	14	-1.937	12.063	9.651	2.413	1.033 ok	1086.4	0.208	1.241 ok	150	0.12	0.12	0.490	-0.282 Decreased	
BW24/0545	K Vaughan	18	18	16	14	-1.923	12.077	9.662	2.415	1.033 ok	1092.9	0.207	1.240 ok	150	0.12	0.12	0.487	-0.280 Decreased	
M35/9635	MR & MRS D J & K A MCKENZIE	17.86	17.86	15.36	13.36	-1.250	12.110	9.688	2.422	0.000 ok	1099.4	0.206	0.206 ok	150	0.12	0.12	0.288	-0.082 Decreased	
M35/4738	A. Smith	13.7	15	12	10	-1.780	8.220	6.576	1.644	0.319 ok	1103.8	0.205	0.524 ok	150	0.12	0.12	0.697	-0.492 Decreased	
BW24/0768	Craig Pethig	22.56	22.56	17.4	15.4	-1.796	13.604	10.883	2.721	0.707 ok	1106.3	0.205	0.912 ok	150	0.12	0.12	0.352	-0.148 Decreased	
M35/9983	Mr & Mrs MA & MJ Prosser	23.95	23.95	19.95	17.95	-3.980	13.970	11.176	2.794	0.000 ok	1108.4	0.204	0.204 ok	150	0.12	0.12	0.394	-0.190 Decreased	
M35/2730	Mr A D & Ms A Smith	7.3	15	12	10	-1.780	8.220	6.576	1.644	0.104 ok	1116.3	0.203	0.307 ok	150	4	2.03	0.665	-0.452 Decreased	
M35/9642	MR & MRS D J & K A MCKENZIE	17.25	17.25	15.25	13.25	-1.300	11.950	9.560	2.390	0.000 ok	1137.8	0.199	0.199 ok	150	0.12	0.12	0.283	-0.083 Decreased	
M35/6483	GRAINGER .P.	20	20	18	16	-1.830	14.170	11.336	2.834	0.115 ok	1146.0	0.198	0.312 ok	150	0.12	0.12	0.809	-0.611 Decreased	
M35/11286	Macrae Land Company	15.3	15.3	14.3	12.3	-0.740	11.560	9.248	2.312	0.481 ok	1150.9	0.197	0.678 ok	150	0.12	0.12	0.295	-0.098 Decreased	
M35/9257	Mr M D & Mrs N E Wilkinson	18	18	16.5	14.5	-1.360	13.140	10.512	2.628	0.000 ok	1159.9	0.196	0.196 ok	150	0.12	0.12	0.428	-0.232 Decreased	
M35/3064	Mr & Mrs P J & R J Sherriff	12.5	15	12	10	-1.810	8.190	6.552	1.638	1.443 ok	1168.0	0.194	1.637 ok	150	0	0	1.094	-0.899 Decreased	
M35/1836	Mr & Mrs RS & C R Scott	16.8	16.8	1	-1	-2.130	-3.130	-2.504	-0.626	0.107 Screen>>	1173.8	0.193	0.300 Exceeded	150	4.75	2.54	0.657	-0.464 Decreased	
BW24/0575	Greg Holland	18	18	16	14	-1.602	12.398	9.919	2.480	0.000 ok	1174.5	0.193	0.193 ok	150	0.12	0.12	0.349	-0.155 Decreased	
M35/9603	MR & MRS J D & K A MCKENZIE	17.7	17.7	15.7	13.7	-1.140	12.560	10.048	2.512	0.107 ok	1188.5	0.191	0.298 ok	150	0.12	0.12	0.254	-0.063 Decreased	
M35/2699	Mr & Mrs J D & K A McKenzie	13.3	15	12	10	-1.370	8.630	6.904	1.726	0.000 ok	1216.9	0.186	0.186 ok	150	0.12	0.12	0.270	-0.083 Decreased	
M35/5021	SCOTT R.S.	12.8	15	12	10	-1.820	8.180	6.544	1.636	0.218 ok	1218.4	0.186	0.404 ok	150	0.12	0.12	0.599	-0.412 Decreased	
M35/0314	BAGRIE WL	15.8	15.8	11	9	-1.320	7.680	6.144	1.536	1.411 ok	1224.9	0.185	1.596 Exceeded	150	0.12	0.12	0.356	-0.171 Decreased	
M35/9258	Mr M D & Mrs N E Wilkinson	18	18	16.5	14.5	-1.340	13.160	10.528	2.632	0.000 ok	1226.2	0.185	0.185 ok	150	0.12	0.12	0.372	-0.187 Decreased	
BW24/0565	Simon Collin	18	18	16	14	-1.950	12.050	9.640	2.410	1.031 ok	1228.1	0.185	1.215 ok	150	0.12	0.12	0.404	-0.219 Decreased	
BW24/0544	Michael Meade	17.3	17.3	15.3	13.3	-1.943	11.357	9.086	2.271	1.046 ok	1228.6	0.185	1.230 ok	150	0.12	0.12	0.395	-0.210 Decreased	
M35/11073	Jenkins M	20.3	20.3	18.8	16.8	-3.690	13.110	10.488	2.622	0.520 ok	1233.6	0.184	0.704 ok	150	0.12	0.12	0.278	-0.095 Decreased	
BW24/0640		23	23	15	13	-1.921	11.079	8.863	2.216	1.102 ok	1238.0	0.183	1.285 ok	150	0.12	0.12	0.373	-0.190 Decreased	
M35/4778	P D & A G Bagrie	10.7	15	12	10	-1.150	8.850	7.080	1.770	0.680 ok	1247.6	0.182	0.862 ok	150	20	10	0.350	-0.168 Decreased	
M35/4771	CROZIER N.J.	6.7	15	12	10	-1.060	8.940	7.152	1.788	0.141 ok	1263.2	0.179	0.320 ok	150	0.12	0.12	0.234	-0.055 Decreased	
M35/6688	MASON W.I.G	18	18	15	13	-1.900	11.100	8.880	2.220	1.513 ok	1274.8	0.177	1.691 ok	150	0.12	0.12	1.864	-1.687 Decreased	
M35/3065	Mr & Mrs P J & R J Sherriff	12	15	12	10	-1.900	8.100	6.480	1.620	1.573 ok	1276.5	0.177	1.750 Exceeded	150	0	0	1.047	-0.870 Decreased	
M35/9643	Mr BW Magee & Mrs R McCourt	17.5	17.5	15.5	13.5	-1.300	12.200	9.760	2.440	0.000 ok	1299.8	0.174	0.174 ok	150	0.12	0.12	0.233	-0.06	

M35/4774	BURROWS T.F.	11.2	15	12	10	-1.870	8.130	6.504	1.626	0.119	ok	1349.1	0.166	0.285	ok	150	0.12	0.12	0.543	-0.377	Decreased
M35/7023	BLACK PC & KL	0	15	12	10	-2.085	7.915	6.332	1.583	0.130	ok	1352.1	0.166	0.295	ok	150	0.12	0.12	0.605	-0.440	Decreased
M35/0646	BUCHANAN R.J. & S.R.	13.7	15	12	10	-1.810	8.190	6.552	1.638	0.000	ok	1356.9	0.165	0.165	ok	150	0	0	0.439	-0.274	Decreased
BW24/0334	Russell Pegler	24	24	23	21	-1.501	19.499	15.599	3.900	0.000	ok	1363.2	0.164	0.164	ok	150	0.12	0.12	0.220	-0.056	Decreased
BW24/0427	Ohoka School	17.35	17.35	15.85	13.85	-1.506	12.344	9.875	2.469	0.116	ok	1371.0	0.163	0.279	ok	150	0.12	0.12	0.203	-0.040	Decreased
M35/11067	MACRAE LAND COMPANY	20	20	18.5	16.5	-0.690	15.810	12.648	3.162	0.295	ok	1375.0	0.162	0.457	ok	150	0.12	0.12	0.207	-0.044	Decreased
M35/0609	SCHOOL	6.7	15	12	10	-1.060	8.940	7.152	1.788	0.141	ok	1376.2	0.162	0.303	ok	150	0	0	0.202	-0.040	Decreased
M35/8662	WHYTE GK & C	19	19	17	15	-1.840	13.160	10.528	2.632	0.102	ok	1388.2	0.161	0.262	ok	150	0.12	0.12	0.443	-0.283	Decreased
M35/6773	BLACK P.C.	24	24	22	20	-4.170	15.830	12.664	3.166	0.269	ok	1391.7	0.160	0.429	ok	150	0.12	0.12	0.706	-0.546	Decreased
M35/5972	Mr & Mrs J D & K A McKenzie	13.9	15	12	10	-1.160	8.840	7.072	1.768	0.000	ok	1391.9	0.160	0.160	ok	150	0.12	0.12	0.199	-0.039	Decreased
M35/9634	MR & MRS D J & K A MCKENZIE	17.35	17.35	14.85	12.85	-1.420	11.430	9.144	2.286	0.125	ok	1394.5	0.160	0.285	ok	150	0.12	0.12	0.228	-0.068	Decreased
M35/6830	Mr R J Fife and D J Jamieson	13.9	15	12	10	-1.750	8.250	6.600	1.650	0.000	ok	1415.3	0.157	0.157	ok	150	0.12	0.12	0.347	-0.191	Decreased
M35/6123	ALLISON .R.	13.6	15	12	10	-1.840	8.160	6.528	1.632	0.102	ok	1417.8	0.156	0.258	ok	150	0.12	0.12	0.424	-0.268	Decreased
M35/4719	POWER G.J.	8.5	15	12	10	-1.590	8.410	6.728	1.682	2.510	Exceeded	1421.7	0.156	2.666	Exceeded	150	0.12	0.12	0.665	-0.509	Decreased
M35/6268	A Verkerk Limited	12	15	12	10	-0.300	9.700	7.760	1.940	1.840	ok	1427.7	0.155	1.995	Exceeded	150	17.5	15.55	0.679	-0.524	Decreased
M35/11068	MACRAE LAND COMPANY	19	19	17.5	15.5	-0.640	14.860	11.888	2.972	0.476	ok	1440.3	0.153	0.629	ok	150	0.12	0.12	0.199	-0.046	Decreased
M35/7205	TONKIN G.D. & S.A.	12	15	12	10	-1.240	8.760	7.008	1.752	0.112	ok	1442.0	0.153	0.265	ok	150	0.12	0.12	0.192	-0.039	Decreased
M35/6797	WITHERS D	20	20	17	15	-1.950	13.050	10.440	2.610	0.142	ok	1459.3	0.151	0.292	ok	150	0.12	0.12	0.557	-0.406	Decreased
M35/0603	MacRae Land Company Limited	11.3	15	12	10	-0.860	9.140	7.312	1.828	0.577	ok	1461.6	0.150	0.727	ok	150	0	0	0.207	-0.057	Decreased
BW24/0583	Peter Bagrie	77.65	77.65	74.65	72.65	-1.925	70.725	56.580	14.145	1.540	ok	1470.4	0.431	1.972	ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/4751	FREE D.R. & I.C.	5	15	12	10	-1.550	8.450	6.760	1.690	0.170	ok	1487.9	0.147	0.317	ok	150	0.12	0.12	0.231	-0.084	Decreased
M35/8170	Mr & Mrs D B & C R Pugh	11.92	15	12	10	-1.150	8.850	7.080	1.770	0.103	ok	1494.0	0.146	0.249	ok	150	1.5	1.5	0.175	-0.029	Decreased
M35/2624	JOHNSON LHM	16.56	16.56	13.56	11.56	-1.290	10.270	8.216	2.054	0.117	ok	1496.2	0.146	0.263	ok	150	0	0	0.184	-0.038	Decreased
BW24/0251	Michael Hussey	50	50	45.1	43.1	-0.820	42.280	33.824	8.456	0.584	ok	1508.8	0.408	0.992	ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/4740	CAMERON J G (EX WARD F.J)	0	15	12	10	-2.011	7.989	6.391	1.598	2.649	Exceeded	1514.4	0.143	2.793	Exceeded	150	0.12	0.12	0.683	-0.540	Decreased
M35/2918	A D & E H CORNISH	8.5	15	12	10	-1.410	8.590	6.872	1.718	0.129	ok	1532.7	0.141	0.270	ok	150	0.12	0.12	0.190	-0.049	Decreased
M35/0616	A D & E H CORNISH	12.8	15	12	10	-1.440	8.560	6.848	1.712	0.150	ok	1533.7	0.141	0.291	ok	150	0	0	0.195	-0.054	Decreased
M35/11066	MACRAE LAND COMPANY	21	21	19.5	17.5	-3.590	13.910	11.128	2.782	0.453	ok	1535.4	0.141	0.593	ok	150	0.12	0.12	0.168	-0.027	Decreased
M35/6547	CLARK DG & EM	15	15	12	10	-1.870	8.130	6.504	1.626	0.000	ok	1555.7	0.138	0.138	ok	150	0.12	0.12	0.349	-0.212	Decreased
M35/7903	DAVIDSON LA & J	18	18	16.5	14.5	-1.610	12.890	10.312	2.578	0.138	ok	1557.9	0.138	0.275	ok	150	0.12	0.12	0.450	-0.312	Decreased
M35/4725	ROBSON W.J.	19.8	19.8	16.8	14.8	-1.960	12.840	10.272	2.568	0.135	ok	1572.5	0.136	0.271	ok	150	0.12	0.12	0.433	-0.297	Decreased
M35/6587	WARREN AH & BL	15	15	12	10	-2.010	7.990	6.392	1.598	0.541	ok	1572.9	0.136	0.677	ok	150	0.12	0.12	0.644	-0.509	Decreased
M35/5190	TUANUI B.V.	9	15	12	10	-1.030	8.970	7.176	1.794	0.265	ok	1591.7	0.133	0.398	ok	150	0.12	0.12	0.153	-0.019	Decreased
M35/3309	J G & S Wright	12	15	12	10	-1.320	8.680	6.944	1.736	0.000	ok	1593.8	0.133	0.133	ok	150	4.9	4.9	0.194	-0.061	Decreased
M35/0602	ARMSTRONG MA & GG	14	15	12	10	-0.900	9.100	7.280	1.820	0.551	ok	1598.2	0.133	0.683	ok	150	0.12	0.12	0.165	-0.032	Decreased
M35/7194	Mr M R & Mrs S J Wells	24	24	22	20	-3.560	16.440	13.152	3.288	0.215	ok	1599.0	0.132	0.347	ok	150	1.77	1.52	0.152	-0.019	Decreased
M35/6061	CAMERON N & A	20.8	20.8	17.8	15.8	-4.140	11.660	9.328	2.332	0.268	ok	1609.1	0.131	0.400	ok	150	0.12	0.12	0.490	-0.359	Decreased
M35/7152	Glenalbany Deer Park Limited	15.5	15.5	12.5	10.5	-2.604	7.896	6.317	1.579	1.660	Exceeded	1610.3	0.131	1.791	Exceeded	150	3.95	2.77	0.992	-0.861	Decreased
M35/7288	POLSON AH DR	12	15	12	10	-1.840	8.160	6.528	1.632	0.000	ok	1616.2	0.130	0.130	ok	150	0.12	0.12	0.293	-0.162	Decreased
M35/10517	Union Specialties (NZ) Limited	23.16	23.16	21.16	19.16	-4.300	14.860	11.888	2.972	1.850	ok	1620.6	0.130	1.980	ok	150	0.12	0.12	0.961	-0.831	Decreased
M35/4979	Ms M E Hopkinson	20	20	17	15	-2.260	12.740	10.192	2.548	1.793	ok	1635.3	0.128	1.921	ok	150	15.71	10	0.897	-0.768	Decreased
M35/4777	BAGRIE W.L.	15.2	15.2	12.2	10.2	-1.070	9.130	7.304	1.826	0.609	ok	1647.1	0.127	0.736	ok	150	0.12	0.12	0.212	-0.086	Decreased
M35/0595	W Power	18.3	18.3	6.8	4.8	-2.150	2.650	2.120	0.530	0.947	Exceeded	1648.7	0.126	1.073	Exceeded	150	4.9	4.9	0.783	-0.657	Decreased
M35/4727	THIELE G.J.	9.1	15	12	10	-2.220	7.780	6.224	1.556	1.769	Exceeded	1659.7	0.125	1.895	Exceeded	150	0.12	0.12	0.929	-0.804	Decreased
M35/0601	J Denham	12.8	15	12	10	-0.550	9.450	7.560	1.890	0.397	ok	1669.4	0.124	0.521	ok	150	12.6	7.62	0.144	-0.020	Decreased
M35/4184	COMBRIDGE K.	11	15	12	10	-1.930	8.070	6.456	1.614	0.108	ok	1670.6	0.124	0.232	ok	150	0.12	0.12	0.320	-0.196	Decreased
BW24/0120	MR DEAN STEPHEN MCCONNELL	23.5	23.5	21.5	19.5	-1.592	17.908	14.327	3.582	0.000	ok	1672.2	0.124	0.124	ok	150	0.12	0.12	0.236	-0.113	Decreased
BW24/0121	MR DEAN STEPHEN MCCONNELL	29.9	29.9	21.5	19.5	-1.592	17.908	14.327	3.582	0.000	ok	1672.2	0.124	0.124	ok	150	0.12	0.12	0.236	-0.113	Decreased
M35/6851	Mr S T Hampton	18	18	15	13	-1.930	11.070	8.856	2.214	0.438	ok	1692.1	0.121	0.560	ok	150	1.83	1.28	0.531	-0.409	Decreased
M35/11071	MACRAE LAND COMPANY	42	42	38.5	36.5	-3.660	32.840	26.272	6.568	2.040	ok	1716.2	0.303	2.343	ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/10624	MR J D MCKENZIE	20.5	20.5	18.5	16.5	-3.840	12.660	10.128	2.532	0.151	ok	1719.7	0.118	0.269	ok	150	0.12	0.12	0.140	-0.021	Decreased
M35/4731	FREWER K.P.	12.2	15	12	10	-1.690	8.310	6.648	1.662	0.000	ok	1756.8	0.114	0.114	ok	150	0.12	0.12	0.189	-0.075	Decreased
M35/11070	MACRAE LAND COMPANY	20.4	20.4	18.9	16.9	-3.650	13.250	10.600	2.650	0.586	ok	1770.8	0.113	0.698	ok	150	0.12	0.12	0.147	-0.034	Decreased
M35/4776	JOHNSON L.H.M.	6.7	15	12	10	-1.240	8.760	7.008	1.752	0.232	ok	1786.4	0.111	0.343	ok	150	0.12	0.12	0.125	-0.014	Decreased
M35/3078	Mr R G & Mrs D R Dalley	13	15	12	10	-1.670	8.330	6.664	1.666	0.105	ok	1787.3	0.111	0.216	ok	150	0.12	0.12	0.177	-0.066	Decreased
M35/6973	Mr J R Dunlop	19.7	19.7	17.14	15.14	-1.960	13.180	10.544	2.636	0.108	ok	1798.0	0.110	0.218	ok	150	2.31	2.12	0.274	-0.164	Decreased
M35/8191	Mr & Mrs D B & C R Pugh	12	15	12	10	-1.324	8.676	6.940	1.735	0.000	ok	1802.8	0.109	0.109	ok	150	4.9	4.9	0.121	-0.012	Decreased
M35/0309	Keilyn Farms Limited	7.3	15	12	10	-1.790	8.210	6.568	1.642	2.005	Exceeded	1809.1	0.109	2.113	Exceeded	150	29.95	23.57	0.531	-0.423	Decreased
M35/4683	HARRIS I.R.	9.3	15	12	10	-2.860	7.140	5.712	1.428	0.889	ok	1822.5	0.107	0.996	ok	150	0.12	0.12	0.570	-0.463	Decreased
M35/5736	Canterbury Pet Foods Limited	15.5	15.5	12.5	10.5	-2.350	8.150	6.520	1.630	1.652	Exceeded	1828.5	0.107	1.758	Exceeded	150	4.29	3.33	0.719	-0.613	

M35/10625	MR J D MCKENZIE	20	20	18	16	-1.280	14.720	11.776	2.944	0.161 ok	1864.7	0.103	0.264 ok	150	0.12	0.12	0.115	-0.012	Decreased
M35/5608	Pheloung Investments Limited	15	15	13.5	11.5	-2.110	9.390	7.512	1.878	0.136 ok	1867.2	0.103	0.238 ok	150	0.12	0.12	0.290	-0.187	Decreased
M35/9558	MR & MRS A F & C J ROSLING	24	24	22.5	20.5	-3.840	16.660	13.328	3.332	0.483 ok	1872.4	0.102	0.585 ok	150	0	0	0.441	-0.338	Decreased
M35/10480	Mr & Mrs DW & TL Lindsay	23.73	23.73	21.73	19.73	-4.230	15.500	12.400	3.100	0.705 ok	1881.5	0.101	0.806 ok	150	0.12	0.12	0.494	-0.393	Decreased
M35/3308	CROFT W.D.	17.2	17.2	14.2	12.2	-1.630	10.570	8.456	2.114	0.227 ok	1892.6	0.100	0.327 ok	150	0	0	0.145	-0.045	Decreased
BW24/0246	Inglewood Holdings Kaipoi Limited	18.3	18.3	16.3	14.3	-1.286	13.014	10.411	2.603	0.466 ok	1893.9	0.000	0.466 ok	0	0.12	0.12	0.095	-0.095	Decreased
M35/4858	Mr & Mrs G G & S J Armstrong	13.7	15	12	10	-0.890	9.110	7.288	1.822	0.422 ok	1897.1	0.000	0.422 ok	0	11.25	7.62	0.095	-0.095	Decreased
M35/11711	MR WT MCLAUGHLAN	17.41	17.41	15.41	13.41	-0.890	12.520	10.016	2.504	0.633 ok	1897.9	0.000	0.633 ok	0	0.12	0.12	0.111	-0.111	Decreased
M35/2726	Mr D S & Mrs R A McConnell & Ms A M Rowe	12	15	12	10	-1.780	8.220	6.576	1.644	0.000 ok	1899.8	0.000	0.000 ok	0	4.99	2.97	0.171	-0.171	Decreased
M35/8975	P A & P L Trumic	22	22	20.5	18.5	-3.910	14.590	11.672	2.918	0.626 ok	1902.5	0.000	0.626 ok	0	0.12	0.12	0.445	-0.445	Decreased
M35/0352	Mr & Mrs I L & J H Ward	4.79	15	12	10	-1.830	8.170	6.536	1.634	1.055 ok	1911.9	0.000	1.055 ok	0	0	0	0.290	-0.290	Decreased
M35/7575	VERBERN F.W	18	18	16.5	14.5	-1.480	13.020	10.416	2.604	0.000 ok	1915.5	0.000	0.000 ok	0	0.12	0.12	0.193	-0.193	Decreased
M35/4552	Mr & Mrs D K & E C Purvis	9	15	12	10	-2.860	7.140	5.712	1.428	2.242 Exceeded	1924.1	0.000	2.242 Exceeded	0	3.8	3.8	0.598	-0.598	Decreased
M35/6794	BROWN K.T.	15	15	12	10	-2.090	7.910	6.328	1.582	0.150 ok	1932.5	0.000	0.150 ok	0	0.12	0.12	0.285	-0.285	Decreased
BW24/0190	Edward Bruce Milne Welch	98.4	98.4	95.4	93.4	-2.000	91.400	73.120	18.280	2.162 ok	1934.2	0.225	2.387 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/7368	IRRIGATION PUMPING SERVICES	17	17	14	12	-1.570	10.430	8.344	2.086	0.236 ok	1935.5	0.000	0.236 ok	0	0.12	0.12	0.130	-0.130	Decreased
M35/4728	ADAMS R.D.	27.4	27.4	24.4	22.4	-4.130	18.270	14.616	3.654	0.291 ok	1939.3	0.000	0.291 ok	0	0.12	0.12	0.334	-0.334	Decreased
M35/4729	ADAMS R.D.	27.4	27.4	24.4	22.4	-4.130	18.270	14.616	3.654	0.291 ok	1939.3	0.000	0.291 ok	0	0	0	0.334	-0.334	Decreased
M35/18054	MR G J & MRS J M CAMPBELL	18.8	18.8	17.8	15.8	-1.020	14.780	11.824	2.956	0.282 ok	1945.1	0.000	0.282 ok	0	0.12	0.12	0.086	-0.086	Decreased
M35/3235	BYRNE M.H.	11	15	12	10	-1.800	8.200	6.560	1.640	0.147 ok	1945.2	0.000	0.147 ok	0	0.12	0.12	0.164	-0.164	Decreased
M35/4669	WARD L.G.	11	15	12	10	-1.500	8.500	6.800	1.700	1.070 ok	1947.2	0.000	1.070 ok	0	0.12	0.12	0.282	-0.282	Decreased
M35/17793	MR & MRS D L & M H ASHBY	76.5	76.5	71.81	69.81	-1.290	68.520	54.816	13.704	0.831 ok	1955.0	0.219	1.050 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/4857	ROWLANDS W.R.	13	15	12	10	-0.900	9.100	7.280	1.820	0.629 ok	1962.9	0.000	0.629 ok	0	0.12	0.12	0.081	-0.081	Decreased
M35/17683	MR & MRS I L & J H WARD	77	77	71.1	69.1	-1.170	67.930	54.344	13.586	0.495 ok	1969.3	0.215	0.710 ok	150	0.12	0.12	#N/A	#N/A	#N/A
BW24/0407	Graham Armstrong	23.3	23.3	21.33	19.33	-1.244	18.086	14.469	3.617	0.639 ok	1969.6	0.000	0.639 ok	0	0.12	0.12	0.081	-0.081	Decreased
M35/11069	MACRAE LAND COMPANY	18	18	16.5	14.5	-0.590	13.910	11.128	2.782	0.482 ok	1972.2	0.000	0.482 ok	0	0.12	0.12	0.096	-0.096	Decreased
M35/10626	MR J D MCKENZIE	19.87	19.87	17.87	15.87	-1.270	14.600	11.680	2.920	0.139 ok	1978.7	0.000	0.139 ok	0	0.12	0.12	0.098	-0.098	Decreased
M35/8900	Mr & Mrs B P & P M Batchelor	20.24	20.24	17.24	15.24	-4.100	11.140	8.912	2.228	0.294 ok	1979.3	0.000	0.294 ok	0	11	11	0.160	-0.160	Decreased
M35/3307	CROFT W.D.	17	17	14	12	-1.650	10.350	8.280	2.070	0.128 ok	1983.7	0.000	0.128 ok	0	0	0	0.131	-0.131	Decreased
BW24/0525	Bevan Batchelor	59.6	59.6	57.6	55.6	-2.042	53.558	42.846	10.712	2.022 ok	1984.6	0.210	2.233 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/8901	Mares Properties	90.95	90.95	84.18	82.18	0.150	82.330	65.864	16.466	1.279 ok	1986.1	0.210	1.489 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/9218	Sparrow K & H	24	24	22.5	20.5	-3.920	16.580	13.264	3.316	0.685 ok	1999.1	0.000	0.685 ok	0	0	0	0.414	-0.414	Decreased
M35/4668	Mr & Mrs I L & J H Ward	8.62	15	12	10	-1.510	8.490	6.792	1.698	1.102 ok	1999.5	0.000	1.102 ok	0	0	0	0.273	-0.273	Decreased

Input file used Bore Location 3.prm

Model Parameters for drawdown calculations

Standard Screen Length :3m

Standard Pump Length :2m

Depth Range of pumped Aquifer taken from 31m till 999m

Transmissivity 115 m2/d

Storativity 0.00063

Leakage 660 OR 0.0003 KB

Sigma 0.1

T0 975 m2/d

WellNo	Owner	Depth	AdoptDepth	Top_Screen	CutOff	Calc80Min	Available	Protected	DD4Interference	CumDD	OkCumDD	VIR/0001_Dist	VIR/0001_DDA	VIR/0001_DD	VIR/0001_DDok	VIR/0001_DomP	Q7	Q150	ExistingDD	Change	Result
VIR/0001		84	84	81	79	-2.087	76.913	61.530	15.383	4.246	ok	0.0	0.000	4.246	ok	0	28.96	28.96	#N/A	#N/A	#N/A
M35/0388	WALLS G.D.	0	15	12	10	-2.099	7.901	6.321	1.580	1.823	Exceeded	60.9	0.395	2.218	Exceeded	150	0.12	0.12	1.298	-0.903	Decreased
M35/4785	THACKWELL G.M.	6.1	15	12	10	-1.440	8.560	6.848	1.712	1.864	Exceeded	94.4	0.392	2.256	Exceeded	150	0.12	0.12	1.162	-0.769	Decreased
M35/4788	WRAPSON J.	0	15	12	10	-2.109	7.891	6.313	1.578	1.864	Exceeded	94.4	0.392	2.256	Exceeded	150	0.12	0.12	1.162	-0.769	Decreased
BW24/0262	Waimakariri District Council	84.7	84.7	78	76	-2.127	73.873	59.098	14.775	0.000	ok	112.8	6.831	6.831	ok	150	18	18	#N/A	#N/A	#N/A
M35/5609	Waimakariri District Council	18.8	18.8	16.8	14.8	-1.480	13.320	10.656	2.664	1.466	ok	113.0	0.390	1.856	ok	150	18	18	1.349	-0.959	Decreased
M35/4770	DELLOW P.K.	0	15	12	10	-2.118	7.882	6.306	1.576	1.828	Exceeded	184.7	0.380	2.209	Exceeded	150	0.12	0.12	1.031	-0.651	Decreased
M35/4747	LESLIE D.H.& M.A.	5.4	15	12	10	-1.400	8.600	6.880	1.720	1.508	ok	199.3	0.378	1.886	Exceeded	150	0.12	0.12	1.540	-1.162	Decreased
M35/0387	REGNAULT C.R.	6	15	12	10	-1.500	8.500	6.800	1.700	2.451	Exceeded	227.4	0.373	2.824	Exceeded	150	0.12	0.12	1.087	-0.713	Decreased
M35/0326	Mr & Mrs P J & R J Sherriff	13.7	15	12	10	-1.390	8.610	6.888	1.722	1.403	ok	256.7	0.368	1.771	Exceeded	150	0	0	0.665	-0.297	Decreased
M35/0386	LESLIE D.H.& M.A.	4	15	12	10	-1.380	8.620	6.896	1.724	1.506	ok	257.1	0.368	1.874	Exceeded	150	0.12	0.12	1.195	-0.826	Decreased
M35/0367	Mr & Mrs P J & R J Sherriff	9.4	15	12	10	-1.480	8.520	6.816	1.704	2.091	Exceeded	266.9	0.367	2.457	Exceeded	150	0	0	0.771	-0.405	Decreased
M35/4782	BISMAN I.W.	20.4	20.4	20.4	18.4	-4.150	14.250	11.400	2.850	1.443	ok	284.5	0.363	1.807	ok	150	0.12	0.12	1.399	-1.036	Decreased
M35/4745	ARMSTRONG M.A.& G.G.	0	15	12	10	-2.081	7.919	6.335	1.584	1.537	ok	310.7	0.359	1.896	Exceeded	150	0.12	0.12	0.928	-0.569	Decreased
M35/4722	Wicklow Farming Limited	12	15	12	10	-1.530	8.470	6.776	1.694	1.696	Exceeded	346.7	0.352	2.048	Exceeded	150	22.57	22.57	1.002	-0.651	Decreased
M35/5147	BOULTON I.W.	12	15	12	10	-1.350	8.650	6.920	1.730	1.277	ok	356.9	0.350	1.627	ok	150	0.12	0.12	1.000	-0.650	Decreased
M35/7909	MOORE EH	20	20	17	15	-1.440	13.560	10.848	2.712	1.759	ok	388.7	0.344	2.103	ok	150	0.12	0.12	0.802	-0.458	Decreased
M35/0305	LESLIE D.H.& M.A.	5.8	15	12	10	-1.550	8.450	6.760	1.690	1.924	Exceeded	410.5	0.339	2.263	Exceeded	150	0.12	0.12	1.416	-1.076	Decreased
BW24/0095	WICKLOW FARMING LTD	50	50	47	45	-2.266	42.734	34.187	8.547	1.924	ok	437.3	2.652	4.576	ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/4795	WaterForce Rangiora	13.8	15	12	10	-1.140	8.860	7.088	1.772	1.152	ok	451.4	0.331	1.483	ok	150	0.12	0.12	0.930	-0.598	Decreased
M35/3247	VERKERK SETTLEMENT	9.1	15	12	10	-1.580	8.420	6.736	1.684	2.500	Exceeded	454.3	0.331	2.831	Exceeded	150	0.12	0.12	1.102	-0.771	Decreased
M35/5134	MURRAY IMPLEMENTS CO.	0	15	12	10	-1.988	8.012	6.409	1.602	1.132	ok	462.0	0.329	1.461	ok	150	0.12	0.12	0.942	-0.613	Decreased
M35/4789	MURRAY IMPLEMENTS	13.7	15	12	10	-1.310	8.690	6.952	1.738	1.110	ok	472.6	0.327	1.437	ok	150	0.12	0.12	0.962	-0.635	Decreased
M35/7533	LYALL T.M	6	15	12	10	-1.310	8.690	6.952	1.738	1.100	ok	478.2	0.326	1.426	ok	150	0	0	0.967	-0.641	Decreased
M35/4717	IRELAND W.P.& F.W.	9.1	15	12	10	-1.320	8.680	6.944	1.736	1.167	ok	533.0	0.315	1.482	ok	150	0.12	0.12	0.708	-0.394	Decreased
BW24/0520	Tim Baker	11.22	15	12	10	-1.932	8.068	6.454	1.614	0.953	ok	546.2	0.312	1.265	ok	150	0.12	0.12	0.839	-0.527	Decreased
M35/4554	A Verkerk Limited	7.5	15	12	10	-1.600	8.400	6.720	1.680	1.927	Exceeded	557.1	0.310	2.237	Exceeded	150	11.88	11.88	1.167	-0.858	Decreased
M35/0320	OFFWOOD D.	9.1	15	12	10	-1.310	8.690	6.952	1.738	0.903	ok	559.4	0.309	1.212	ok	150	0.12	0.12	0.950	-0.641	Decreased
BW24/0364	Gabe Rijpma	14.1	15	12	10	-1.907	8.093	6.474	1.619	0.870	ok	563.4	0.308	1.178	ok	150	0.12	0.12	0.767	-0.458	Decreased
M35/4790	WALLS C.A.S.	10.2	15	12	10	-1.290	8.710	6.968	1.742	0.827	ok	569.7	0.307	1.134	ok	150	0.12	0.12	0.832	-0.525	Decreased
M35/4794	HEATLEY K.	6.1	15	12	10	-1.290	8.710	6.968	1.742	0.827	ok	569.7	0.307	1.134	ok	150	0.12	0.12	0.832	-0.525	Decreased
M35/4841	MAUNSELL R.& J.L.	6.1	15	12	10	-1.290	8.710	6.968	1.742	0.827	ok	569.7	0.307	1.134	ok	150	0.12	0.12	0.832	-0.525	Decreased
BW24/0216	Ohoka Service Station 1992 Limited	4	15	12	10	-1.934	8.066	6.453	1.613	0.800	ok	587.6	0.303	1.103	ok	150	0	0	0.845	-0.541	Decreased
M35/4746	VERKERK A.	9.1	15	12	10	-1.610	8.390	6.712	1.678	2.062	Exceeded	588.3	0.303	2.365	Exceeded	150	0.12	0.12	1.240	-0.937	Decreased
M35/4720	MOORE E.H.	5.4	15	12	10	-1.350	8.650	6.920	1.730	1.171	ok	589.6	0.303	1.474	ok	150	0.12	0.12	0.628	-0.325	Decreased
BW24/0218	Ohoka Service Station 1992 Limited	4	15	12	10	-1.924	8.076	6.461	1.615	0.784	ok	609.8	0.299	1.083	ok	150	0	0	0.822	-0.523	Decreased
BW24/0215	Ohoka Service Station 1992 Limited	4	15	12	10	-1.904	8.096	6.477	1.619	0.786	ok	612.9	0.298	1.085	ok	150	0	0	0.810	-0.511	Decreased
BW24/0217	Ohoka Service Station 1992 Limited	4	15	12	10	-1.919	8.081	6.465	1.616	0.778	ok	619.3	0.297	1.075	ok	150	0	0	0.811	-0.514	Decreased
BW24/0219	Ohoka Service Station 1992 Limited	4	15	12	10	-1.892	8.108	6.487	1.622	0.775	ok	632.0	0.294	1.069	ok	150	0	0	0.788	-0.494	Decreased
M35/0385	FLINTOFT W.L.	6.5	15	12	10	-1.260	8.740	6.992	1.748	0.769	ok	667.6	0.287	1.056	ok	150	0.12	0.12	0.728	-0.441	Decreased
M35/8381	Marilyn Brown	88	88	86.5	84.5	-1.040	83.460	66.768	16.692	1.196	ok	721.4	1.480	2.676	ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/0389	EYRE C.C.	0	15	12	10	-1.884	8.116	6.493	1.623	0.690	ok	731.7	0.274	0.964	ok	150	0	0	0.735	-0.460	Decreased
M35/4792	OLSEN M.	9.1	15	12	10	-1.250	8.750	7.000	1.750	0.690	ok	731.7	0.274	0.964	ok	150	0.12	0.12	0.735	-0.460	Decreased
M35/8399	LYNN RJ	10.5	15	12	10	-1.240	8.760	7.008	1.752	0.771	ok	736.2	0.273	1.044	ok	150	0.12	0.12	0.627	-0.353	Decreased
M35/4744	ARMSTRONG M.A.& G.G.	0	15	12	10	-1.766	8.234	6.588	1.647	0.718	ok	766.1	0.267	0.985	ok	150	0.12	0.12	0.640	-0.373	Decreased
M35/4719	POWER G.J.	8.5	15	12	10	-1.590	8.410	6.728	1.682	2.510	Exceeded	800.2	0.261	2.771	Exceeded	150	0.12	0.12	0.665	-0.404	Decreased
M35/6268	A Verkerk Limited	12	15	12	10	-0.300	9.700	7.760	1.940	1.840	ok	823.0	0.256	2.096	Exceeded	150	17.5	15.55	0.679	-0.422	Decreased
BW24/0529	Jarrad Allen	18	18	16	14	-2.029	11.971	9.577	2.394	1.033	ok	833.8	0.254	1.287	ok	150	0.12	0.12	0.490	-0.236	Decreased
BW24/0545	K Vaughan	18	18	16	14	-2.023	11.977	9.581	2.395	1.033	ok	837.2	0.254	1.286	ok	150	0.12	0.12	0.487	-0.234	Decreased
M35/7701	HJ SMITH	86	86	84	82	-0.980	81.020	64.816	16.204	0.934	ok	853.9	1.161	2.095	ok	150	0.12	0.12	#N/A	#N/A	#N/A

BW24/0552	Benn & Amy Mathieson	20	20	18	16	-2.000	14.000	11.200	2.800	1.034 ok	860.7	0.249	1.283 ok	150	0.12	0.12	0.485	-0.236	Decreased
M35/0596	Canterbury Regional Council	2.9	15	12	10	-0.750	9.250	7.400	1.850	1.624 ok	861.0	0.249	1.873 Exceeded	150	0.12	0.12	1.357	-1.108	Decreased
M35/9071	Watson A A	12	15	12	10	-0.900	9.100	7.280	1.820	0.797 ok	867.1	0.248	1.045 ok	150	0	0	0.547	-0.299	Decreased
BW24/0624	Sam Jury	18	18	16	14	-1.975	12.025	9.620	2.405	1.035 ok	891.2	0.243	1.279 ok	150	0.12	0.12	0.471	-0.227	Decreased
M35/4723	ARMITAGE P.L.	0	15	12	10	-1.990	8.010	6.408	1.602	0.485 ok	897.6	0.242	0.727 ok	150	0.12	0.12	0.819	-0.577	Decreased
M35/7754	WILKINSON PB	24	24	23	21	-3.720	17.280	13.824	3.456	0.476 ok	902.5	0.241	0.717 ok	150	0.12	0.12	0.750	-0.509	Decreased
M35/4879	MCQUILLAN R.	13.7	15	12	10	-1.190	8.810	7.048	1.762	0.562 ok	955.3	0.231	0.794 ok	150	0.12	0.12	0.569	-0.337	Decreased
M35/5133	MARSHALL J.J.	20	20	17	15	-1.260	13.740	10.992	2.748	0.433 ok	980.3	0.227	0.660 ok	150	0.12	0.12	0.608	-0.381	Decreased
M35/10520	Mr & Mrs RW & HI Southam	17.9	17.9	15.9	13.9	-1.220	12.680	10.144	2.536	0.433 ok	980.7	0.227	0.660 ok	150	0.12	0.12	0.582	-0.355	Decreased
M35/4743	ARMSTRONG M.A.& G.G.	13.7	15	12	10	-1.170	8.830	7.064	1.766	0.593 ok	981.9	0.227	0.819 ok	150	0.12	0.12	0.506	-0.280	Decreased
M35/4740	CAMERON J G (EX WARD F.J)	0	15	12	10	-2.037	7.963	6.370	1.593	2.649 Exceeded	983.5	0.226	2.876 Exceeded	150	0.12	0.12	0.683	-0.457	Decreased
BW24/0565	Simon Collin	18	18	16	14	-2.053	11.947	9.557	2.389	1.031 ok	985.1	0.226	1.257 ok	150	0.12	0.12	0.404	-0.178	Decreased
M35/4724	ALEXANDER	13.5	15	12	10	-1.450	8.550	6.840	1.710	0.439 ok	990.2	0.225	0.664 ok	150	0	0	0.783	-0.558	Decreased
BW24/0251	Michael Hussey	50	50	45.1	43.1	-0.820	42.280	33.824	8.456	0.584 ok	1005.1	0.894	1.479 ok	150	0.12	0.12	#N/A	#N/A	#N/A
BW24/0544	Michael Meade	17.3	17.3	15.3	13.3	-2.046	11.254	9.003	2.251	1.046 ok	1009.6	0.222	1.267 ok	150	0.12	0.12	0.395	-0.173	Decreased
M35/3066	MASON W.I.G.	6.7	15	12	10	-1.720	8.280	6.624	1.656	1.464 ok	1038.1	0.216	1.681 Exceeded	150	0.12	0.12	1.612	-1.396	Decreased
M35/6181	WALKER D.J.	12	15	12	10	-1.560	8.440	6.752	1.688	0.417 ok	1060.4	0.213	0.630 ok	150	0.12	0.12	0.909	-0.697	Decreased
BW24/0640		23	23	15	13	-2.026	10.974	8.779	2.195	1.102 ok	1067.4	0.211	1.314 ok	150	0.12	0.12	0.373	-0.162	Decreased
M35/11074	MACRAE LAND COMPANY	17	17	15.5	13.5	-0.830	12.670	10.136	2.534	0.650 ok	1100.2	0.206	0.856 ok	150	0.12	0.12	0.435	-0.230	Decreased
M35/0314	BAGRIE WL	15.8	15.8	11	9	-1.320	7.680	6.144	1.536	1.411 ok	1127.1	0.201	1.612 Exceeded	150	0.12	0.12	0.356	-0.155	Decreased
M35/9599	Mr & Mrs G J & T.A Burbery	17.4	17.4	15.4	13.4	-1.370	12.030	9.624	2.406	0.370 ok	1127.4	0.201	0.571 ok	150	0.12	0.12	0.602	-0.401	Decreased
M35/4778	P D & A G Bagrie	10.7	15	12	10	-1.150	8.850	7.080	1.770	0.680 ok	1136.8	0.199	0.880 ok	150	20	10	0.350	-0.150	Decreased
M35/3042	EYRE C.C.	6.1	15	12	10	-1.130	8.870	7.096	1.774	0.486 ok	1137.9	0.199	0.685 ok	150	0	0	0.448	-0.249	Decreased
M35/3064	Mr & Mrs P J & R J Sherriff	12.5	15	12	10	-1.810	8.190	6.552	1.638	1.443 ok	1150.0	0.197	1.640 Exceeded	150	0	0	1.094	-0.896	Decreased
M35/9600	MR & MRS J D & K A MCKENZIE	17.53	17.53	15.53	13.53	-1.410	12.120	9.696	2.424	0.361 ok	1153.9	0.197	0.558 ok	150	0.12	0.12	0.617	-0.420	Decreased
M35/8951	J D & K A McKenzie	18.05	18.05	16.05	14.05	-1.460	12.590	10.072	2.518	0.352 ok	1183.9	0.192	0.544 ok	150	0.12	0.12	0.653	-0.461	Decreased
BW24/0768	Craig Pethig	22.56	22.56	17.4	15.4	-1.901	13.499	10.799	2.700	0.707 ok	1207.8	0.188	0.895 ok	150	0.12	0.12	0.352	-0.165	Decreased
M35/9598	MR & MRS J D & K A MCKENZIE	17.28	17.28	15.28	13.28	-1.310	11.970	9.576	2.394	0.333 ok	1217.2	0.186	0.519 ok	150	0.12	0.12	0.509	-0.323	Decreased
M35/9601	MR & MRS J D & K A MCKENZIE	23.5	23.5	21.5	19.5	-4.010	15.490	12.392	3.098	0.333 ok	1217.2	0.186	0.519 ok	150	0.12	0.12	0.509	-0.323	Decreased
M35/3306	Merv Emms	17	17	14	12	-1.580	10.420	8.336	2.084	0.348 ok	1231.6	0.184	0.532 ok	150	3	3	0.926	-0.742	Decreased
M35/3065	Mr & Mrs P J & R J Sherriff	12	15	12	10	-1.900	8.100	6.480	1.620	1.573 ok	1236.3	0.183	1.756 Exceeded	150	0	0	1.047	-0.864	Decreased
M35/9423	Mr & Mrs P J & R J Sherriff	30	30	27	25	-2.050	22.950	18.360	4.590	0.351 ok	1243.6	0.182	0.533 ok	150	0	0	0.645	-0.463	Decreased
M35/8112	Walker DJH and CM	20.25	20.25	18.25	16.25	-3.970	12.280	9.824	2.456	0.331 ok	1258.3	0.180	0.510 ok	150	0.12	0.12	0.744	-0.564	Decreased
M35/6688	MASON W.I.G	18	18	15	13	-1.900	11.100	8.880	2.220	1.513 ok	1260.6	0.180	1.693 ok	150	0.12	0.12	1.864	-1.684	Decreased
M35/0352	Mr & Mrs I L & J H Ward	4.79	15	12	10	-1.830	8.170	6.536	1.634	1.055 ok	1271.8	0.178	1.233 ok	150	0	0	0.290	-0.112	Decreased
BW24/0583	Peter Bagrie	77.65	77.65	74.65	72.65	-2.030	70.620	56.496	14.124	1.540 ok	1292.5	0.564	2.104 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/4669	WARD L.G.	11	15	12	10	-1.500	8.500	6.800	1.700	1.070 ok	1302.0	0.173	1.243 ok	150	0.12	0.12	0.282	-0.109	Decreased
M35/0309	Keilyn Farms Limited	7.3	15	12	10	-1.790	8.210	6.568	1.642	2.005 Exceeded	1311.0	0.172	2.177 Exceeded	150	29.95	23.57	0.531	-0.359	Decreased
M35/17683	MR & MRS I L & J H WARD	77	77	71.1	69.1	-1.170	67.930	54.344	13.586	0.495 ok	1330.7	0.532	1.027 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/11075	MACRAE LAND COMPANY	20	20	17	15	-1.070	13.930	11.144	2.786	0.432 ok	1334.5	0.168	0.600 ok	150	0.12	0.12	0.344	-0.176	Decreased
M35/9638	MR & MRS D J & K A MCKENZIE	17.82	17.82	15.32	13.32	-1.380	11.940	9.552	2.388	0.104 ok	1335.5	0.168	0.272 ok	150	0.12	0.12	0.493	-0.324	Decreased
M35/4668	Mr & Mrs I L & J H Ward	8.62	15	12	10	-1.510	8.490	6.792	1.698	1.102 ok	1347.4	0.166	1.268 ok	150	0	0	0.273	-0.107	Decreased
M35/7073	WALKER D.J.H.& C.M.	18.8	18.8	16.8	14.8	-1.530	13.270	10.616	2.654	0.106 ok	1352.8	0.166	0.271 ok	150	0.12	0.12	0.610	-0.444	Decreased
M35/3019	MacRae Land Company Limited	15.4	15.4	12.4	10.4	-1.060	9.340	7.472	1.868	0.325 ok	1373.1	0.163	0.488 ok	150	0	0	0.333	-0.170	Decreased
M35/3032	Kate Mullins	19.7	19.7	16.7	14.7	-1.690	13.010	10.408	2.602	0.208 ok	1383.2	0.161	0.369 ok	150	0.12	0.12	0.867	-0.706	Decreased
M35/9637	MR & MRS D J & K A MCKENZIE	17.6	17.6	15.1	13.1	-1.440	11.660	9.328	2.332	0.000 ok	1398.3	0.159	0.159 ok	150	0.12	0.12	0.501	-0.342	Decreased
M35/18188	MR M P EMMS	18	18	16.86	14.86	-1.240	13.620	10.896	2.724	0.101 ok	1412.4	0.157	0.258 ok	150	0.12	0.12	0.724	-0.567	Decreased
M35/11286	Macrae Land Company	15.3	15.3	14.3	12.3	-0.740	11.560	9.248	2.312	0.481 ok	1418.1	0.156	0.637 ok	150	0.12	0.12	0.295	-0.139	Decreased
M35/11073	Jenkins M	20.3	20.3	18.8	16.8	-3.690	13.110	10.488	2.622	0.520 ok	1431.0	0.155	0.674 ok	150	0.12	0.12	0.278	-0.124	Decreased
M35/4979	Ms M E Hopkinson	20	20	17	15	-2.260	12.740	10.192	2.548	1.793 ok	1434.2	0.154	1.947 ok	150	15.71	10	0.897	-0.742	Decreased
M35/11077	MACRAE LAND COMPANY	18	18	16.5	14.5	-0.740	13.760	11.008	2.752	0.330 ok	1440.4	0.153	0.484 ok	150	0.12	0.12	0.308	-0.154	Decreased
M35/17793	MR & MRS D L & M H ASHBY	76.5	76.5	71.81	69.81	-1.290	68.520	54.816	13.704	0.831 ok	1446.4	0.447	1.278 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/9602	MR & MRS J D & K A MCKENZIE	17.4	17.4	15.4	13.4	-1.170	12.230	9.784	2.446	0.000 ok	1479.1	0.148	0.148 ok	150	0.12	0.12	0.335	-0.187	Decreased
M35/9639	MR & MRS D J & K A MCKENZIE	17.5	17.5	15	13	-1.380	11.620	9.296	2.324	0.000 ok	1480.9	0.148	0.148 ok	150	0.12	0.12	0.419	-0.271	Decreased
M35/4772	Robin Ames	0	15	12	10	-1.932	8.068	6.455	1.614	0.000 ok	1490.5	0.146	0.146 ok	150	0.12	0.12	0.801	-0.654	Decreased
M35/4726	MARSHALL J.J.	5.7	15	12	10	-1.090	8.910	7.128	1.782	0.116 ok	1491.8	0.146	0.262 ok	150	0.12	0.12	0.304	-0.158	Decreased
M35/4777	BAGRIE W.L.	15.2	15.2	12.2	10.2	-1.070	9.130	7.304	1.826	0.609 ok	1513.8	0.143	0.753 ok	150	0.12	0.12	0.212	-0.069	Decreased
M35/11072	MACRAE LAND COMPANY	18	18	16.5	14.5	-0.700	13.800	11.040	2.760	0.549 ok	1519.1	0.143	0.692 ok	150	0.12	0.12	0.245	-0.102	Decreased
M35/9636	RJ & AR North	17.82	17.82	15.82	13.82	-1.260	12.560	10.048	2.512	0.000 ok	1521.2	0.142	0.142 ok	150	0.12	0.12	0.350	-0.208	Decreased
BW24/0539	Brian and Agnes McLintock	18	18	16	14	-1.750	12.250	9.800	2.450	0.000 ok	1535.4	0.141	0.141 ok	150	0.12	0.12	0.474	-0.333	Decreased
M35/9640	MR & MRS D J & K A MCKENZIE	16.47	16.47	14.47	12.47	-1.330	11.140	8.912	2.228	0.000 ok	1545.0	0.139	0.139 ok	150	0.12	0.12	0.368	-0.229	Decreased
M35/6483	GRAINGER .P.	20	20	18	16	-1.830	14.170	11.336	2.834	0.115 ok	1547.7	0.139	0.253 ok	150	0.12	0.12	0.809	-0.670	Decreased

M35/17685	MR H & MRS V J WUNDERINK	97.7	97.7	94.7	92.7	-0.910	91.790	73.432	18.358	1.527 ok	1555.8	0.381	1.908 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/7152	Glenalbany Deer Park Limited	15.5	15.5	12.5	10.5	-2.599	7.901	6.321	1.580	1.660 Exceeded	1558.9	0.138	1.797 Exceeded	150	3.95	2.77	0.992	-0.855 Decreased	
M35/4730	RUTHERFORD K.A.	12.1	15	12	10	-1.610	8.390	6.712	1.678	0.000 ok	1565.0	0.137	0.137 ok	150	0.12	0.12	0.543	-0.407 Decreased	
M35/4739	WARD L.G.& I.L.	11.2	15	12	10	-1.530	8.470	6.776	1.694	0.982 ok	1572.1	0.136	1.118 ok	150	0.12	0.12	0.214	-0.078 Decreased	
M35/4727	THIELE G.J.	9.1	15	12	10	-2.220	7.780	6.224	1.556	1.769 Exceeded	1576.5	0.135	1.905 Exceeded	150	0.12	0.12	0.929	-0.794 Decreased	
M35/4741	SCOTT J.H.	9.1	15	12	10	-2.790	7.210	5.768	1.442	2.403 Exceeded	1577.6	0.135	2.538 Exceeded	150	0.12	0.12	0.640	-0.505 Decreased	
M35/10517	Union Specialties (NZ) Limited	23.16	23.16	21.16	19.16	-4.300	14.860	11.888	2.972	1.850 ok	1596.4	0.133	1.983 ok	150	0.12	0.12	0.961	-0.828 Decreased	
M35/4738	A. Smith	13.7	15	12	10	-1.780	8.220	6.576	1.644	0.319 ok	1606.5	0.132	0.451 ok	150	0.12	0.12	0.697	-0.566 Decreased	
M35/2730	Mr A D & Ms A Smith	7.3	15	12	10	-1.780	8.220	6.576	1.644	0.104 ok	1637.5	0.128	0.232 ok	150	4	2.03	0.655	-0.527 Decreased	
M35/4552	Mr & Mrs D K & E C Purvis	9	15	12	10	-2.860	7.140	5.712	1.428	2.242 Exceeded	1639.7	0.128	2.370 Exceeded	150	3.8	3.8	0.598	-0.470 Decreased	
M35/2728	Mr H C & Mrs J A de Boer	12.2	15	12	10	-1.670	8.330	6.664	1.666	0.000 ok	1644.1	0.127	0.127 ok	150	0	0	0.537	-0.410 Decreased	
M35/4428	HARRIS I.R.	19.4	19.4	16.4	14.4	-1.910	12.490	9.992	2.498	0.257 ok	1654.5	0.126	0.383 ok	150	0.12	0.12	0.757	-0.631 Decreased	
M35/0603	MacRae Land Company Limited	11.3	15	12	10	-0.860	9.140	7.312	1.828	0.577 ok	1658.8	0.125	0.702 ok	150	0	0	0.207	-0.082 Decreased	
M35/1836	Mr & Mrs RS & CR Scott	16.8	16.8	1	-1	-2.130	-3.130	-2.504	-0.626	0.107 Screen>>	1667.6	0.124	0.231 Exceeded	150	4.75	2.54	0.657	-0.533 Decreased	
M35/6077	Mr & Mrs IL & JH Ward	20.5	20.5	17.5	15.5	-4.450	11.050	8.840	2.210	1.382 ok	1670.4	0.124	1.506 ok	150	22	20.06	0.241	-0.117 Decreased	
M35/9641	MR & MRS D J & K A MCKENZIE	16.05	16.05	14.05	12.05	-1.310	10.740	8.592	2.148	0.000 ok	1676.1	0.123	0.123 ok	150	0.12	0.12	0.311	-0.188 Decreased	
M35/9635	MR & MRS D J & K A MCKENZIE	17.86	17.86	15.36	13.36	-1.250	12.110	9.688	2.422	0.000 ok	1685.6	0.122	0.122 ok	150	0.12	0.12	0.288	-0.166 Decreased	
M35/10982	MR & MRS IL & JH WARD	18	18	16.5	14.5	-1.390	13.110	10.488	2.622	2.067 ok	1689.8	0.122	2.189 ok	150	0.12	0.12	0.266	-0.145 Decreased	
M35/8900	Mr & Mrs B P & P M Batchelor	20.24	20.24	17.24	15.24	-4.100	11.140	8.912	2.228	0.294 ok	1690.9	0.122	0.416 ok	150	11	11	0.160	-0.038 Decreased	
M35/9603	MR & MRS J D & K A MCKENZIE	17.7	17.7	15.7	13.7	-1.140	12.560	10.048	2.512	0.107 ok	1704.5	0.120	0.227 ok	150	0.12	0.12	0.254	-0.134 Decreased	
M35/4771	CROZIER N.J.	6.7	15	12	10	-1.060	8.940	7.152	1.788	0.141 ok	1715.3	0.119	0.259 ok	150	0.12	0.12	0.234	-0.115 Decreased	
M35/4614	TOZER N.A.	0	15	12	10	-2.787	7.213	5.771	1.443	2.137 Exceeded	1721.4	0.118	2.255 Exceeded	150	0.12	0.12	0.274	-0.156 Decreased	
M35/6773	BLACK P.C.	24	24	22	20	-4.170	15.830	12.664	3.166	0.269 ok	1721.4	0.118	0.387 ok	150	0.12	0.12	0.706	-0.588 Decreased	
M35/9633	MR & MRS D J & K A MCKENZIE	17.55	17.55	15.55	13.55	-1.460	12.090	9.672	2.418	0.000 ok	1721.9	0.118	0.118 ok	150	0.12	0.12	0.355	-0.237 Decreased	
M35/9632	MR & MRS D J & K A MCKENZIE	17.37	17.37	15.37	13.37	-1.490	11.880	9.504	2.376	0.000 ok	1728.2	0.117	0.117 ok	150	0.12	0.12	0.365	-0.248 Decreased	
M35/5021	SCOTT R.S.	12.8	15	12	10	-1.820	8.180	6.544	1.636	0.218 ok	1730.0	0.117	0.335 ok	150	0.12	0.12	0.599	-0.481 Decreased	
BW24/0525	Bevan Batchelor	59.6	59.6	57.6	55.6	-2.136	53.464	42.771	10.693	2.022 ok	1736.4	0.295	2.317 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/11068	MACRAE LAND COMPANY	19	19	17.5	15.5	-0.640	14.860	11.888	2.972	0.476 ok	1743.6	0.116	0.591 ok	150	0.12	0.12	0.199	-0.083 Decreased	
M35/9642	MR & MRS D J & K A MCKENZIE	17.25	17.25	15.25	13.25	-1.300	11.950	9.560	2.390	0.000 ok	1753.3	0.115	0.115 ok	150	0.12	0.12	0.283	-0.168 Decreased	
M35/0595	W Power	18.3	18.3	6.8	4.8	-2.150	2.650	2.120	0.530	0.947 Exceeded	1754.7	0.114	1.061 Exceeded	150	4.9	4.9	0.783	-0.669 Decreased	
M35/9983	Mr & Mrs MA & MJ Prosser	23.95	23.95	19.95	17.95	-3.980	13.970	11.176	2.794	0.000 ok	1761.5	0.114	0.114 ok	150	0.12	0.12	0.394	-0.281 Decreased	
M35/4716	Sandra Dent	13.7	15	12	10	-1.580	8.420	6.736	1.684	1.374 ok	1771.9	0.113	1.486 ok	150	0	0	0.171	-0.058 Decreased	
M35/11067	MACRAE LAND COMPANY	20	20	18.5	16.5	-0.690	15.810	12.648	3.162	0.295 ok	1773.9	0.112	0.407 ok	150	0.12	0.12	0.207	-0.094 Decreased	
BW23/0643	Kevin Hart	11	15	12	10	-2.870	7.130	5.704	1.426	2.001 Exceeded	1777.4	0.112	2.113 Exceeded	150	0.12	0.12	0.250	-0.138 Decreased	
M35/7023	BLACK PC & KL	0	15	12	10	-2.063	7.937	6.350	1.587	0.130 ok	1790.2	0.111	0.240 ok	150	0.12	0.12	0.605	-0.495 Decreased	
M35/9257	Mr M D & Mrs N E Wilkinson	18	18	16.5	14.5	-1.360	13.140	10.512	2.628	0.000 ok	1790.6	0.111	0.111 ok	150	0.12	0.12	0.428	-0.318 Decreased	
M35/5736	Canterbury Pet Foods Limited	15.5	15.5	12.5	10.5	-2.350	8.150	6.520	1.630	1.652 Exceeded	1801.7	0.109	1.761 Exceeded	150	4.29	3.33	0.719	-0.610 Decreased	
M35/7171	Glenalbany Deer Park Limited	13	15	12	10	-2.350	7.650	6.120	1.530	1.652 Exceeded	1801.7	0.109	1.761 Exceeded	150	0	0	0.719	-0.610 Decreased	
M35/7153	MARWICK A.J. & C.L.	38	38	37	35	-4.150	30.850	24.680	6.170	1.276 ok	1814.0	0.265	1.541 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/4827	S & L C BATCHELOR	13.1	15	12	10	-1.110	8.890	7.112	1.778	0.639 ok	1817.8	0.108	0.747 ok	150	0.12	0.12	0.126	-0.018 Decreased	
M35/11071	MACRAE LAND COMPANY	42	42	38.5	36.5	-3.660	32.840	26.272	6.568	2.040 ok	1824.7	0.261	2.301 ok	150	0.12	0.12	#N/A	#N/A	#N/A
BW24/0575	Greg Holland	18	18	16	14	-1.597	12.403	9.922	2.481	0.000 ok	1832.7	0.106	0.106 ok	150	0.12	0.12	0.349	-0.243 Decreased	
M35/4774	BURROWS T.F.	11.2	15	12	10	-1.870	8.130	6.504	1.626	0.119 ok	1840.2	0.105	0.224 ok	150	0.12	0.12	0.543	-0.437 Decreased	
M35/4099	CAMERON J.G. & J.L.	11.5	15	12	10	-2.980	7.020	5.616	1.404	2.538 Exceeded	1844.6	0.105	2.643 Exceeded	150	0.12	0.12	0.375	-0.270 Decreased	
M35/6587	WARREN AH & BL	15	15	12	10	-2.010	7.990	6.392	1.598	0.541 ok	1845.1	0.105	0.646 ok	150	0.12	0.12	0.644	-0.540 Decreased	
BW24/0048	MR & MRS B P & P M BATCHELOR	48.41	48.41	46.41	44.41	-2.373	42.037	33.629	8.407	1.578 ok	1845.7	0.254	1.831 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/0308	Mr E A Anderson	9.5	15	12	10	-3.190	6.810	5.448	1.362	2.375 Exceeded	1847.2	0.105	2.480 Exceeded	150	4.71	2.75	0.419	-0.314 Decreased	
M35/0609	SCHOOL	6.7	15	12	10	-1.060	8.940	7.152	1.788	0.141 ok	1848.8	0.104	0.246 ok	150	0	0	0.202	-0.097 Decreased	
BW23/0572	Kevin Hart	10.62	15	12	10	-2.870	7.130	5.704	1.426	2.188 Exceeded	1850.6	0.104	2.292 Exceeded	150	0.12	0.12	0.248	-0.143 Decreased	
M35/2699	Mr & Mrs J D & K A McKenzie	13.3	15	12	10	-1.370	8.630	6.904	1.726	0.000 ok	1856.9	0.104	0.104 ok	150	0.12	0.12	0.270	-0.166 Decreased	
M35/0602	ARMSTRONG MA & GG	14	15	12	10	-0.900	9.100	7.280	1.820	0.551 ok	1868.5	0.102	0.653 ok	150	0.12	0.12	0.165	-0.062 Decreased	
M35/9258	Mr M D & Mrs N E Wilkinson	18	18	16.5	14.5	-1.340	13.160	10.528	2.632	0.000 ok	1869.5	0.102	0.102 ok	150	0.12	0.12	0.372	-0.270 Decreased	
M35/11070	MACRAE LAND COMPANY	20.4	20.4	18.9	16.9	-3.650	13.250	10.600	2.650	0.586 ok	1876.3	0.102	0.687 ok	150	0.12	0.12	0.147	-0.045 Decreased	
M35/6797	WITHERS D	20	20	17	15	-1.950	13.050	10.440	2.610	0.142 ok	1880.1	0.101	0.243 ok	150	0.12	0.12	0.557	-0.455 Decreased	
BW24/0526	Bevan Batchelor	59.3	59.3	55.5	53.5	-2.334	51.166	40.933	10.233	1.228 ok	1883.7	0.241	1.469 ok	150	0.12	0.12	#N/A	#N/A	#N/A
BW24/0427	Ohoka School	17.35	17.35	15.85	13.85	-1.582	12.268	9.815	2.454	0.116 ok	1884.8	0.101	0.217 ok	150	0.12	0.12	0.203	-0.102 Decreased	
BW24/0560	Graham Brown	11.7	15	12	10	-1.564	8.436	6.749	1.687	0.000 ok	1885.2	0.101	0.101 ok	150	0.12	0.12	0.218	-0.118 Decreased	
M35/6178	JOHNSON R. & G.	0	15	12	10	-2.079	7.921	6.337	1.584	0.560 ok	1895.1	0.000	0.560 ok	0	0.12	0.12	0.109	-0.109 Decreased	
M35/0351	Keilyn Farms Limited	11.4	15	12	10	-3.250	6.750	5.400	1.350	1.784 Exceeded	1896.6	0.000	1.784 Exceeded	0	29.95	23.57	0.282	-0.282 Decreased	
M35/6863	BARRINGTON W.J.	15	15	12	10	-1.720	8.280	6.624	1.656	1.911 Exceeded	1898.2	0.000	1.911 Exceeded	0	0.12	0.12	0.215	-0.215 Decreased	
M35/9643	Mr BW Magee & Mrs R McCourt	17.5	17.5	15.5	13.5	-1.300	12.200	9.760	2.440	0.000 ok	1915.8	0.000	0.000 ok	0	0.12	0.12	0.233	-0.233 Decreased	
BW24/0122	WILLOWS FARM LIMITED	65.4	65.4	60.53	58.53	-2.309	56.221	44.977	11.244	1.336 ok	1924.8	0.228	1.564 ok	150	0.12	0.12	#N/A	#N/A	#N/A

M35/0646	BUCHANAN R.J.& S.R.	13.7	15	12	10	-1.810	8.190	6.552	1.638	0.000 ok	1924.8	0.000	0.000 ok	0	0	0	0.439	-0.439	Decreased
M35/11066	MACRAE LAND COMPANY	21	21	19.5	17.5	-3.590	13.910	11.128	2.782	0.453 ok	1937.2	0.000	0.453 ok	0	0.12	0.12	0.168	-0.168	Decreased
M35/8662	WHYTE GK & C	19	19	17	15	-1.840	13.160	10.528	2.632	0.102 ok	1941.1	0.000	0.102 ok	0	0.12	0.12	0.443	-0.443	Decreased
M35/5972	Mr & Mrs JD & KA McKenzie	13.9	15	12	10	-1.160	8.840	7.072	1.768	0.000 ok	1942.3	0.000	0.000 ok	0	0.12	0.12	0.199	-0.199	Decreased
M35/4832	RANDS B.W.	9.1	15	12	10	-1.990	8.010	6.408	1.602	2.001 Exceeded	1950.3	0.000	2.001 Exceeded	0	0.12	0.12	0.221	-0.221	Decreased
M35/6179	JOHNSON R.& G.	20	20	17	15	-0.960	14.040	11.232	2.808	0.546 ok	1952.1	0.000	0.546 ok	0	0.12	0.12	0.092	-0.092	Decreased
M35/4742	SCOTT J.H.	9.1	15	12	10	-3.330	6.670	5.336	1.334	2.263 Exceeded	1955.9	0.000	2.263 Exceeded	0	0.12	0.12	0.391	-0.391	Decreased
BW24/0047	MR & MRS B P & P M BATCHELOR	65.6	65.6	63.6	61.6	-2.320	59.280	47.424	11.856	1.459 ok	1959.0	0.218	1.676 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/6123	ALLISON .R.	13.6	15	12	10	-1.840	8.160	6.528	1.632	0.102 ok	1974.0	0.000	0.102 ok	0	0.12	0.12	0.424	-0.424	Decreased
M35/7287	Wyndarra Farm Limited	30	30	27	25	-4.500	20.500	16.400	4.100	1.605 ok	1989.0	0.000	1.605 ok	0	12	9.08	0.158	-0.158	Decreased
BW24/0334	Russell Pegler	24	24	23	21	-1.527	19.473	15.578	3.895	0.000 ok	1990.6	0.000	0.000 ok	0	0.12	0.12	0.220	-0.220	Decreased
M35/6096	Wyndarra Farm Limited	12	15	12	10	-1.490	8.510	6.808	1.702	1.613 ok	1991.2	0.000	1.613 ok	0	12	9.08	0.162	-0.162	Decreased
M35/6191	CUSICK D.J.	11.7	15	12	10	-1.890	8.110	6.488	1.622	1.918 Exceeded	1997.2	0.000	1.918 Exceeded	0	0.12	0.12	0.201	-0.201	Decreased
M35/4683	HARRIS I.R.	9.3	15	12	10	-2.860	7.140	5.712	1.428	0.889 ok	1998.8	0.000	0.889 ok	0	0.12	0.12	0.570	-0.570	Decreased

Input file used Bore Location 4.prn

Model Parameters for drawdown calculations
 Standard Screen Length :3m
 Standard Pump Length :2m
 Depth Range of pumped Aquifer taken from 31m till 999m
 Transmissivity 115 m2/d
 Storativity 0.00063
 Leakage 660 OR 0.0003 KB
 Sigma 0.1
 TO 975 m2/d

WellNo	Owner	Depth	AdoptDepth	Top_Screen	CutOff	Calc80Min	Available	Protected	DD4Interference	CumDD	OkCumDD	VIR/0001_Dist	VIR/0001_DDA	VIR/0001_DD	VIR/0001_DDOK	VIR/0001_DomP	Q7	Q150	Existing DD	Change	Result	
VIR/0001		84	84	81	79	-2.102	76.898	61.518	15.380	0.532	ok	0.0	0.000	0.532	ok		0	28.96	28.96	#N/A	#N/A	#N/A
M35/4772	Robin Ames	0	15	12	10	-2.082	7.918	6.334	1.584	0.000	ok	104.3	0.391	0.391	ok		150	0.12	0.12	0.801	-0.410	Decreased
M35/3032	Kate Mullins	19.7	19.7	16.7	14.7	-1.690	13.010	10.408	2.602	0.208	ok	181.4	0.381	0.589	ok		150	0.12	0.12	0.867	-0.487	Decreased
M35/4738	A. Smith	13.7	15	12	10	-1.780	8.220	6.576	1.644	0.319	ok	182.5	0.381	0.700	ok		150	0.12	0.12	0.697	-0.317	Decreased
M35/9423	Mr & Mrs P J & R J Sherriff	30	30	27	25	-2.099	22.901	18.321	4.580	0.351	ok	198.9	0.378	0.729	ok		150	0	0	0.645	-0.267	Decreased
M35/6483	GRAINGER .P.	20	20	18	16	-1.830	14.170	11.336	2.834	0.115	ok	212.8	0.376	0.490	ok		150	0.12	0.12	0.809	-0.433	Decreased
M35/1836	Mr & Mrs R S & C R Scott	16.8	16.8	1	-1	-2.130	-3.130	-2.504	-0.626	0.107	Screen>>	230.4	0.373	0.480	Exceeded		150	4.75	2.54	0.657	-0.284	Decreased
M35/2730	Mr A D & Ms A Smith	7.3	15	12	10	-1.780	8.220	6.576	1.644	0.104	ok	235.8	0.372	0.476	ok		150	4	2.03	0.655	-0.283	Decreased
M35/5021	SCOTT R.S.	12.8	15	12	10	-1.820	8.180	6.544	1.636	0.218	ok	302.6	0.360	0.578	ok		150	0.12	0.12	0.599	-0.238	Decreased
M35/3306	Merv Emms	17	17	14	12	-1.580	10.420	8.336	2.084	0.348	ok	310.6	0.359	0.706	ok		150	3	3	0.926	-0.567	Decreased
M35/18188	MR M P EMMS	18	18	16.86	14.86	-1.240	13.620	10.896	2.724	0.101	ok	346.7	0.352	0.453	ok		150	0.12	0.12	0.724	-0.372	Decreased
M35/7023	BLACK PC & KL	0	15	12	10	-2.227	7.773	6.219	1.555	0.130	ok	375.9	0.346	0.476	ok		150	0.12	0.12	0.605	-0.259	Decreased
M35/4774	BURROWS T.F.	11.2	15	12	10	-1.870	8.130	6.504	1.626	0.119	ok	399.2	0.342	0.460	ok		150	0.12	0.12	0.543	-0.201	Decreased
M35/4428	HARRIS I.R.	19.4	19.4	16.4	14.4	-1.910	12.490	9.992	2.498	0.257	ok	452.5	0.331	0.588	ok		150	0.12	0.12	0.757	-0.426	Decreased
M35/6797	WITHERS D	20	20	17	15	-1.950	13.050	10.440	2.610	0.142	ok	484.8	0.324	0.466	ok		150	0.12	0.12	0.557	-0.232	Decreased
M35/8112	Walker DJH and CM	20.25	20.25	18.25	16.25	-3.970	12.280	9.824	2.456	0.331	ok	487.8	0.324	0.654	ok		150	0.12	0.12	0.744	-0.420	Decreased
M35/6181	WALKER D.J.	12	15	12	10	-1.560	8.440	6.752	1.688	0.417	ok	490.2	0.323	0.740	ok		150	0.12	0.12	0.909	-0.586	Decreased
M35/6773	BLACK P.C.	24	24	22	20	-4.170	15.830	12.664	3.166	0.269	ok	497.4	0.322	0.591	ok		150	0.12	0.12	0.706	-0.384	Decreased
M35/2728	Mr H C & Mrs J A de Boer	12.2	15	12	10	-1.670	8.330	6.664	1.666	0.000	ok	498.6	0.322	0.322	ok		150	0	0	0.537	-0.216	Decreased
M35/8662	WHYTE GK & C	19	19	17	15	-1.840	13.160	10.528	2.632	0.102	ok	546.6	0.312	0.414	ok		150	0.12	0.12	0.443	-0.131	Decreased
M35/0646	BUCHANAN R.J. & S.R.	13.7	15	12	10	-1.810	8.190	6.552	1.638	0.000	ok	560.0	0.309	0.309	ok		150	0	0	0.439	-0.129	Decreased
M35/4730	RUTHERFORD K.A.	12.1	15	12	10	-1.610	8.390	6.712	1.678	0.000	ok	566.4	0.308	0.308	ok		150	0.12	0.12	0.543	-0.236	Decreased
M35/6123	ALLISON .R.	13.6	15	12	10	-1.840	8.160	6.528	1.632	0.102	ok	581.7	0.305	0.406	ok		150	0.12	0.12	0.424	-0.120	Decreased
M35/7903	DAVIDSON LA & J	18	18	16.5	14.5	-1.610	12.890	10.312	2.578	0.138	ok	592.5	0.302	0.440	ok		150	0.12	0.12	0.450	-0.147	Decreased
M35/4725	ROBSON W.J.	19.8	19.8	16.8	14.8	-1.960	12.840	10.272	2.568	0.135	ok	613.7	0.298	0.434	ok		150	0.12	0.12	0.433	-0.135	Decreased
M35/6061	CAMERON N & A	20.8	20.8	17.8	15.8	-4.140	11.660	9.328	2.332	0.268	ok	637.9	0.293	0.562	ok		150	0.12	0.12	0.490	-0.197	Decreased
M35/7073	WALKER D.J.H. & C.M.	18.8	18.8	16.8	14.8	-1.530	13.270	10.616	2.654	0.106	ok	644.1	0.292	0.398	ok		150	0.12	0.12	0.610	-0.318	Decreased
M35/9257	Mr M D & Mrs N E Wilkinson	18	18	16.5	14.5	-1.360	13.140	10.512	2.628	0.000	ok	685.7	0.284	0.284	ok		150	0.12	0.12	0.428	-0.145	Decreased
M35/6587	WARREN AH & BL	15	15	12	10	-2.010	7.990	6.392	1.598	0.541	ok	716.8	0.277	0.819	ok		150	0.12	0.12	0.644	-0.367	Decreased
M35/6547	CLARK DG & EM	15	15	12	10	-1.870	8.130	6.504	1.626	0.000	ok	739.8	0.273	0.273	ok		150	0.12	0.12	0.349	-0.077	Decreased
M35/4724	ALEXANDER	13.5	15	12	10	-1.450	8.550	6.840	1.710	0.439	ok	751.2	0.270	0.709	ok		150	0	0	0.783	-0.513	Decreased
M35/8951	JD & K A McKenzie	18.05	18.05	16.05	14.05	-1.460	12.590	10.072	2.518	0.352	ok	759.8	0.269	0.621	ok		150	0.12	0.12	0.653	-0.384	Decreased
M35/6851	Mr S T Hampton	18	18	15	13	-1.930	11.070	8.856	2.214	0.438	ok	780.5	0.265	0.703	ok		150	1.83	1.28	0.531	-0.266	Decreased
M35/6830	Mr R J Fife and D J Jamieson	13.9	15	12	10	-1.750	8.250	6.600	1.650	0.000	ok	782.1	0.264	0.264	ok		150	0.12	0.12	0.347	-0.083	Decreased
BW24/0539	Brian and Agnes McLintock	18	18	16	14	-1.862	12.138	9.710	2.428	0.000	ok	812.2	0.258	0.258	ok		150	0.12	0.12	0.474	-0.215	Decreased
M35/4184	COMBRIDGE K.	11	15	12	10	-1.930	8.070	6.456	1.614	0.108	ok	812.5	0.258	0.367	ok		150	0.12	0.12	0.320	-0.062	Decreased
M35/9258	Mr M D & Mrs N E Wilkinson	18	18	16.5	14.5	-1.340	13.160	10.528	2.632	0.000	ok	815.3	0.258	0.258	ok		150	0.12	0.12	0.372	-0.115	Decreased
M35/4723	ARMITAGE P.L.	0	15	12	10	-1.897	8.103	6.483	1.621	0.485	ok	821.6	0.257	0.741	ok		150	0.12	0.12	0.819	-0.563	Decreased
M35/9983	Mr & Mrs MA & MJ Prosser	23.95	23.95	19.95	17.95	-3.980	13.970	11.176	2.794	0.000	ok	839.3	0.253	0.253	ok		150	0.12	0.12	0.394	-0.141	Decreased
M35/9740	MR & MRS K & L CAMPAGNOLO	17.8	17.8	15.29	13.29	-2.100	11.190	8.952	2.238	0.297	ok	875.1	0.246	0.543	ok		150	0.12	0.12	0.380	-0.134	Decreased
M35/3066	MASON W.I.G.	6.7	15	12	10	-1.720	8.280	6.624	1.656	1.464	ok	887.7	0.244	1.708	Exceeded		150	0.12	0.12	1.612	-1.368	Decreased
M35/7288	POLSON AH DR	12	15	12	10	-1.840	8.160	6.528	1.632	0.000	ok	891.9	0.243	0.243	ok		150	0.12	0.12	0.293	-0.049	Decreased
M35/9600	MR & MRS J D & K A MCKENZIE	17.53	17.53	15.53	13.53	-1.410	12.120	9.696	2.424	0.361	ok	899.1	0.242	0.603	ok		150	0.12	0.12	0.617	-0.375	Decreased
M35/9637	MR & MRS DJ & K A MCKENZIE	17.6	17.6	15.1	13.1	-1.440	11.660	9.328	2.332	0.000	ok	901.2	0.241	0.241	ok		150	0.12	0.12	0.501	-0.259	Decreased
M35/3064	Mr & Mrs P J & R J Sherriff	12.5	15	12	10	-1.810	8.190	6.552	1.638	1.443	ok	927.0	0.237	1.679	Exceeded		150	0	0	1.094	-0.857	Decreased
M35/5608	Pheloung Investments Limited	15	15	13.5	11.5	-2.110	9.390	7.512	1.878	0.136	ok	932.0	0.236	0.371	ok		150	0.12	0.12	0.290	-0.054	Decreased
M35/6973	Mr J R Dunlop	19.7	19.7	17.14	15.14	-1.960	13.180	10.544	2.636	0.108	ok	940.4	0.234	0.342	ok		150	2.31	2.12	0.274	-0.040	Decreased

BW24/0575	Greg Holland	18	18	16	14	-1.754	12.246	9.797	2.449	0.000 ok	954.1	0.232	0.232 ok	150	0.12	0.12	0.349	-0.117	Decreased
M35/9558	MR & MRS A F & C J ROSLING	24	24	22.5	20.5	-3.840	16.660	13.328	3.332	0.483 ok	955.4	0.231	0.715 ok	150	0	0	0.441	-0.209	Decreased
M35/4728	ADAMS R.D.	27.4	27.4	24.4	22.4	-4.130	18.270	14.616	3.654	0.291 ok	963.8	0.230	0.521 ok	150	0.12	0.12	0.334	-0.104	Decreased
M35/4729	ADAMS R.D.	27.4	27.4	24.4	22.4	-4.130	18.270	14.616	3.654	0.291 ok	963.8	0.230	0.521 ok	150	0	0	0.334	-0.104	Decreased
M35/6688	MASON W.I.G	18	18	15	13	-1.900	11.100	8.880	2.220	1.513 ok	963.9	0.230	1.743 ok	150	0.12	0.12	1.864	-1.634	Decreased
M35/7754	WILKINSON PB	24	24	23	21	-3.720	17.280	13.824	3.456	0.476 ok	969.6	0.229	0.705 ok	150	0.12	0.12	0.750	-0.521	Decreased
M35/6794	BROWN K.T.	15	15	12	10	-2.090	7.910	6.328	1.582	0.150 ok	976.5	0.227	0.377 ok	150	0.12	0.12	0.285	-0.057	Decreased
M35/9599	Mr & Mrs G.J & T.A Burbery	17.4	17.4	15.4	13.4	-1.370	12.030	9.624	2.406	0.370 ok	986.0	0.226	0.596 ok	150	0.12	0.12	0.602	-0.376	Decreased
M35/3065	Mr & Mrs P J & R J Sherriff	12	15	12	10	-1.900	8.100	6.480	1.620	1.573 ok	1003.5	0.223	1.795 Exceeded	150	0	0	1.047	-0.825	Decreased
M35/9632	MR & MRS D J & K A MCKENZIE	17.37	17.37	15.37	13.37	-1.490	11.880	9.504	2.376	0.000 ok	1003.7	0.223	0.223 ok	150	0.12	0.12	0.365	-0.142	Decreased
M35/0595	W Power	18.3	18.3	6.8	4.8	-2.150	2.650	2.120	0.530	0.947 Exceeded	1004.2	0.222	1.169 Exceeded	150	4.9	4.9	0.783	-0.561	Decreased
M35/8975	PA & P L Trumic	22	22	20.5	18.5	-3.910	14.590	11.672	2.918	0.626 ok	1006.7	0.222	0.848 ok	150	0.12	0.12	0.445	-0.223	Decreased
M35/9638	MR & MRS D J & K A MCKENZIE	17.82	17.82	15.32	13.32	-1.380	11.940	9.552	2.388	0.104 ok	1023.7	0.219	0.323 ok	150	0.12	0.12	0.493	-0.274	Decreased
M35/0596	Canterbury Regional Council	2.96	15	12	10	-0.750	9.250	7.400	1.850	1.624 ok	1029.4	0.218	1.842 ok	150	0.12	0.12	1.357	-1.139	Decreased
M35/10480	Mr & Mrs DW & TL Lindsay	23.73	23.73	21.73	19.73	-4.230	15.500	12.400	3.100	0.705 ok	1038.4	0.216	0.922 ok	150	0.12	0.12	0.494	-0.277	Decreased
M35/4683	HARRIS I.R.	9.3	15	12	10	-2.860	7.140	5.712	1.428	0.889 ok	1044.8	0.215	1.105 ok	150	0.12	0.12	0.570	-0.355	Decreased
M35/9633	MR & MRS D J & K A MCKENZIE	17.55	17.55	15.55	13.55	-1.460	12.090	9.672	2.418	0.000 ok	1060.1	0.213	0.213 ok	150	0.12	0.12	0.355	-0.142	Decreased
M35/8410	MR B M DAVEY	23.9	23.9	21.9	19.9	-3.750	16.150	12.920	3.230	0.133 ok	1091.8	0.207	0.340 ok	150	0.12	0.12	0.237	-0.030	Decreased
BW24/0120	MR DEAN STEPHEN MCCONNELL	23.5	23.5	21.5	19.5	-1.804	17.696	14.157	3.539	0.000 ok	1094.5	0.207	0.207 ok	150	0.12	0.12	0.236	-0.030	Decreased
BW24/0121	MR DEAN STEPHEN MCCONNELL	29.9	29.9	21.5	19.5	-1.804	17.696	14.157	3.539	0.000 ok	1094.5	0.207	0.207 ok	150	0.12	0.12	0.236	-0.030	Decreased
M35/9639	MR & MRS D J & K A MCKENZIE	17.5	17.5	15	13	-1.380	11.620	9.296	2.324	0.000 ok	1102.9	0.205	0.205 ok	150	0.12	0.12	0.419	-0.213	Decreased
M35/9218	Sparrow K & H	24	24	22.5	20.5	-3.920	16.580	13.264	3.316	0.685 ok	1119.5	0.202	0.888 ok	150	0	0	0.414	-0.212	Decreased
M35/9598	MR & MRS J D & K A MCKENZIE	17.28	17.28	15.28	13.28	-1.310	11.970	9.576	2.394	0.333 ok	1158.0	0.196	0.529 ok	150	0.12	0.12	0.509	-0.313	Decreased
M35/9601	MR & MRS J D & K A MCKENZIE	23.5	23.5	21.5	19.5	-4.010	15.490	12.392	3.098	0.333 ok	1158.0	0.196	0.529 ok	150	0.12	0.12	0.509	-0.313	Decreased
M35/10517	Union Specialties (NZ) Limited	23.16	23.16	21.16	19.16	-4.300	14.860	11.888	2.972	1.850 ok	1177.2	0.193	2.043 ok	150	0.12	0.12	0.961	-0.768	Decreased
M35/7113	CLEMENTS K.S.	17.7	17.7	15	13	-2.000	11.000	8.800	2.200	0.121 ok	1184.4	0.192	0.313 ok	150	0.12	0.12	0.200	-0.009	Decreased
BW24/0321	Waimakariri District Council	2.5	15	12	10	-4.110	5.890	4.712	1.178	0.193 ok	1185.3	0.192	0.384 ok	150	0.12	0.12	0.254	-0.063	Decreased
M35/8409	ARCHIBALD TR	23.2	23.2	22.2	20.2	-3.430	16.770	13.416	3.354	0.234 ok	1186.1	0.191	0.425 ok	150	0.12	0.12	0.207	-0.015	Decreased
M35/0696	MULLIGAN P.R.R.	6.1	15	12	10	-2.040	7.960	6.368	1.592	0.239 ok	1206.4	0.188	0.427 ok	150	0.12	0.12	0.196	-0.008	Decreased
M35/7152	Glenalbany Deer Park Limited	15.5	15.5	12.5	10.5	-2.652	7.848	6.278	1.570	1.660 Exceeded	1210.6	0.187	1.847 Exceeded	150	3.95	2.77	0.992	-0.805	Decreased
M35/0305	LESLIE D.H.&M.A.	5.8	15	12	10	-1.550	8.450	6.760	1.690	1.924 Exceeded	1211.4	0.187	2.111 Exceeded	150	0.12	0.12	1.416	-1.228	Decreased
M35/7575	VERBERN F.W	18	18	16.5	14.5	-1.480	13.020	10.416	2.604	0.000 ok	1221.4	0.186	0.186 ok	150	0.12	0.12	0.193	-0.007	Decreased
M35/9222	Mr A & Mrs F A MacKenzie	24	24	22.5	20.5	-3.880	16.620	13.296	3.324	0.368 ok	1237.3	0.183	0.551 ok	150	0.12	0.12	0.283	-0.100	Decreased
M35/9640	MR & MRS D J & K A MCKENZIE	16.47	16.47	14.47	12.47	-1.330	11.140	8.912	2.228	0.000 ok	1246.1	0.182	0.182 ok	150	0.12	0.12	0.368	-0.186	Decreased
M35/5133	MARSHALL J.J.	20	20	17	15	-1.260	13.740	10.992	2.748	0.433 ok	1250.0	0.181	0.614 ok	150	0.12	0.12	0.608	-0.426	Decreased
M35/4746	VERKERK A.	9.1	15	12	10	-1.610	8.390	6.712	1.678	2.062 Exceeded	1250.7	0.181	2.243 Exceeded	150	0.12	0.12	1.240	-1.059	Decreased
M35/10177	Mr PRR Mulligan	17.9	17.9	16.4	14.4	-1.730	12.670	10.136	2.534	0.146 ok	1256.9	0.180	0.326 ok	150	0.12	0.12	0.183	-0.003	Decreased
M35/4751	FREE D.R.&I.C.	5	15	12	10	-1.550	8.450	6.760	1.690	0.170 ok	1260.1	0.180	0.350 ok	150	0.12	0.12	0.231	-0.051	Decreased
M35/10129	Ohoka Park Truffiere limited	17.62	17.62	15.62	13.62	-2.230	11.390	9.112	2.278	0.173 ok	1273.5	0.178	0.350 ok	150	0.12	0.12	0.213	-0.035	Decreased
M35/10130	Ohoka Park Truffiere limited	17.54	17.54	14.54	12.54	-2.200	10.340	8.272	2.068	0.156 ok	1274.6	0.177	0.334 ok	150	0.12	0.12	0.203	-0.025	Decreased
M35/0320	OFFWOOD D.	9.1	15	12	10	-1.310	8.690	6.952	1.738	0.903 ok	1284.4	0.176	1.079 ok	150	0.12	0.12	0.950	-0.774	Decreased
M35/10445	Mr & Ms I & M Willelts	42	42	39	37	-2.780	34.220	27.376	6.844	0.345 ok	1284.8	0.570	0.916 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/4727	THIELE G.J.	9.1	15	12	10	-2.220	7.780	6.224	1.556	1.769 Exceeded	1291.4	0.175	1.944 Exceeded	150	0.12	0.12	0.929	-0.754	Decreased
BW24/0615	Dean McConnell	22.8	22.8	20.8	18.8	-1.757	17.043	13.634	3.409	0.135 ok	1303.4	0.173	0.308 ok	150	0.12	0.12	0.183	-0.010	Decreased
M35/4731	FREWER K.P.	12.2	15	12	10	-1.690	8.310	6.648	1.662	0.000 ok	1309.0	0.172	0.172 ok	150	0.12	0.12	0.189	-0.017	Decreased
M35/4736	BRYNE M.H. (EX STARKEY I.D)	12	15	12	10	-1.760	8.240	6.592	1.648	0.147 ok	1319.5	0.171	0.318 ok	150	0.12	0.12	0.179	-0.008	Decreased
M35/0326	Mr & Mrs P J & R J Sherriff	13.7	15	12	10	-1.390	8.610	6.888	1.722	1.403 ok	1321.1	0.170	1.573 ok	150	0	0	0.665	-0.495	Decreased
M35/5736	Canterbury Pet Foods Limited	15.5	15.5	12.5	10.5	-2.350	8.150	6.520	1.630	1.652 Exceeded	1330.7	0.169	1.821 Exceeded	150	4.29	3.33	0.719	-0.550	Decreased
M35/7171	Glenalbany Deer Park Limited	13	15	12	10	-2.350	7.650	6.120	1.530	1.652 Exceeded	1330.7	0.169	1.821 Exceeded	150	0	0	0.719	-0.550	Decreased
M35/0367	Mr & Mrs P J & R J Sherriff	9.4	15	12	10	-1.480	8.520	6.816	1.704	2.091 Exceeded	1331.8	0.169	2.260 Exceeded	150	0	0	0.771	-0.602	Decreased
M35/10472	Mr & Mrs KM & DA Arthur	24	24	23	21	-3.700	17.300	13.840	3.460	0.290 ok	1332.2	0.169	0.458 ok	150	0.12	0.12	0.168	0.001	Increased
M35/2726	Mr D S & Mrs RA McConnell & Ms J	12	15	12	10	-1.780	8.220	6.576	1.644	0.000 ok	1343.9	0.167	0.167 ok	150	4.99	2.97	0.171	-0.004	Decreased
M35/10520	Mr & Mrs RW & HI Southam	17.9	17.9	15.9	13.9	-1.220	12.680	10.144	2.536	0.433 ok	1347.6	0.166	0.599 ok	150	0.12	0.12	0.582	-0.415	Decreased
M35/4747	LESLIE D.H.&M.A.	5.4	15	12	10	-1.400	8.600	6.880	1.720	1.508 ok	1351.3	0.166	1.674 ok	150	0.12	0.12	1.540	-1.375	Decreased
M35/2699	Mr & Mrs J D & K A McKenzie	13.3	15	12	10	-1.370	8.630	6.904	1.726	0.000 ok	1357.3	0.165	0.165 ok	150	0.12	0.12	0.270	-0.105	Decreased
BW23/0218	Sarah Craig Trust	24	24	21	19	-3.581	15.419	12.335	3.084	0.669 ok	1358.8	0.165	0.834 ok	150	0.12	0.12	0.299	-0.134	Decreased
M35/9641	MR & MRS D J & K A MCKENZIE	16.05	16.05	14.05	12.05	-1.310	10.740	8.592	2.148	0.000 ok	1362.2	0.164	0.164 ok	150	0.12	0.12	0.311	-0.147	Decreased
M35/4767	HINDS P.J.&W.R.	3.6	15	12	10	-1.890	8.110	6.488	1.622	0.000 ok	1365.1	0.164	0.164 ok	150	0.12	0.12	0.160	0.004	Increased
M35/3078	Mr R G & Mrs D R Dalley	13	15	12	10	-1.670	8.330	6.664	1.666	0.105 ok	1369.3	0.163	0.269 ok	150	0.12	0.12	0.177	-0.014	Decreased

M35/3235	BYRNE M.H.	11	15	12	10	-1.800	8.200	6.560	1.640	0.147 ok	1370.0	0.163	0.310 ok	150	0.12	0.12	0.164	-0.001 Decreased
BW24/0057	MR & MRS T & K KOMAI	18	18	16.49	14.49	-3.020	11.470	9.176	2.294	0.234 ok	1379.8	0.162	0.396 ok	150	0.12	0.12	0.164	-0.002 Decreased
M35/4782	BISMAN I.W.	20.4	20.4	20.4	18.4	-4.150	14.250	11.400	2.850	1.443 ok	1381.1	0.162	1.605 ok	150	0.12	0.12	1.399	-1.238 Decreased
M35/5332	Ohoka Downs Society Inc	35.2	35.2	32.5	30.5	-4.200	26.300	21.040	5.260	0.000 ok	1385.8	0.489	0.489 ok	150	17.44	17.35	#N/A	#N/A
M35/9636	RJ & AR North	17.82	17.82	15.82	13.82	-1.260	12.560	10.048	2.512	0.000 ok	1386.8	0.161	0.161 ok	150	0.12	0.12	0.350	-0.190 Decreased
M35/4554	A Verkerk Limited	7.5	15	12	10	-1.600	8.400	6.720	1.680	1.927 Exceeded	1389.5	0.160	2.087 Exceeded	150	11.88	11.88	1.167	-1.007 Decreased
M35/9126	Van't Veen G B & J G	30.5	30.5	19	17	-3.900	13.100	10.480	2.620	0.388 ok	1395.1	0.160	0.547 ok	150	1.47	1.47	0.248	-0.088 Decreased
M35/0389	EYRE C.C.	0	15	12	10	-1.708	8.292	6.633	1.658	0.690 ok	1397.4	0.159	0.849 ok	150	0	0	0.735	-0.575 Decreased
M35/4792	OLSEN M.	9.1	15	12	10	-1.250	8.750	7.000	1.750	0.690 ok	1397.4	0.159	0.849 ok	150	0.12	0.12	0.735	-0.575 Decreased
M35/9634	MR & MRS D J & K A MCKENZIE	17.35	17.35	14.85	12.85	-1.420	11.430	9.144	2.286	0.125 ok	1399.0	0.159	0.284 ok	150	0.12	0.12	0.228	-0.069 Decreased
M35/11622	North Canterbury Truffieres Limite	12.8	15	12	10	-2.090	7.910	6.328	1.582	0.000 ok	1407.3	0.158	0.158 ok	150	8.1	4.34	0.151	0.006 Increased
M35/8537	OHOKA PARK TRUST	18	18	16.5	14.5	-1.750	12.750	10.200	2.550	0.165 ok	1407.9	0.158	0.323 ok	150	0.12	0.12	0.150	0.008 Increased
M35/3309	J G & S Wright	12	15	12	10	-1.320	8.680	6.944	1.736	0.000 ok	1413.0	0.157	0.157 ok	150	4.9	4.9	0.194	-0.037 Decreased
BW23/0705	Renee Browne	22.89	22.89	21.39	19.39	-3.762	15.628	12.503	3.126	0.356 ok	1424.8	0.155	0.512 ok	150	0.12	0.12	0.224	-0.068 Decreased
M35/9642	MR & MRS D J & K A MCKENZIE	17.25	17.25	15.25	13.25	-1.300	11.950	9.560	2.390	0.000 ok	1426.3	0.155	0.155 ok	150	0.12	0.12	0.283	-0.128 Decreased
M35/0388	WALLS G.D.	0	15	12	10	-1.910	8.090	6.472	1.618	1.823 Exceeded	1426.5	0.155	1.978 Exceeded	150	0.12	0.12	1.298	-1.143 Decreased
M35/5609	Waimakariri District Council	18.8	18.8	16.8	14.8	-1.480	13.320	10.656	2.664	1.466 ok	1430.8	0.155	1.620 ok	150	18	18	1.349	-1.194 Decreased
M35/2919	RICHARDS M.E.	24.2	24.2	21.2	19.2	-4.190	15.010	12.008	3.002	0.168 ok	1431.0	0.155	0.322 ok	150	0.12	0.12	0.175	-0.020 Decreased
M35/0651	J H & I M Dugdale	9.4	15	12	10	-1.960	8.040	6.432	1.608	0.000 ok	1440.3	0.153	0.153 ok	150	4.5	2.63	0.143	0.010 Increased
M35/7533	LYALL T.M	6	15	12	10	-1.310	8.690	6.952	1.738	1.100 ok	1441.9	0.153	1.253 ok	150	0	0	0.967	-0.814 Decreased
BW24/0216	Ohoka Service Station 1992 Limite	4	15	12	10	-1.764	8.236	6.588	1.647	0.800 ok	1444.6	0.153	0.952 ok	150	0	0	0.845	-0.092 Decreased
BW24/0218	Ohoka Service Station 1992 Limite	4	15	12	10	-1.755	8.245	6.596	1.649	0.784 ok	1446.7	0.152	0.936 ok	150	0	0	0.822	-0.670 Decreased
M35/4979	Ms M E Hopkinson	20	20	17	15	-2.260	12.740	10.192	2.548	1.793 ok	1448.8	0.152	1.945 ok	150	15.71	10	0.897	-0.745 Decreased
BW24/0217	Ohoka Service Station 1992 Limite	4	15	12	10	-1.749	8.251	6.601	1.650	0.778 ok	1452.1	0.152	0.930 ok	150	0	0	0.811	-0.660 Decreased
M35/4879	MCQUILLAN R.	13.7	15	12	10	-1.190	8.810	7.048	1.762	0.562 ok	1457.9	0.151	0.713 ok	150	0.12	0.12	0.569	-0.418 Decreased
M35/4789	MURRAY IMPLEMENTS	13.7	15	12	10	-1.310	8.690	6.952	1.738	1.110 ok	1459.7	0.151	1.261 ok	150	0.12	0.12	0.962	-0.811 Decreased
M35/6867	HARRIS I. R.	20	20	17	15	-2.520	12.480	9.984	2.496	1.715 ok	1463.5	0.150	1.865 ok	150	0.12	0.12	0.519	-0.369 Decreased
M35/18261	MR J D & MRS S H ADAMS	24	24	20.59	18.59	-3.990	14.600	11.680	2.920	0.186 ok	1467.0	0.150	0.335 ok	150	0.12	0.12	0.141	0.009 Increased
M35/8536	OHOKA PARK TRUST	18	18	16.5	14.5	-1.780	12.720	10.176	2.544	0.187 ok	1467.1	0.150	0.336 ok	150	0.12	0.12	0.139	0.010 Increased
BW24/0215	Ohoka Service Station 1992 Limite	4	15	12	10	-1.726	8.274	6.619	1.655	0.786 ok	1469.0	0.149	0.936 ok	150	0	0	0.810	-0.661 Decreased
M35/2756	JOHNSTON N.J. & R.A.	12.5	15	12	10	-1.830	8.170	6.536	1.634	0.103 ok	1471.9	0.149	0.252 ok	150	0.12	0.12	0.142	0.007 Increased
M35/0386	LESLIE D.H. & M.A.	4	15	12	10	-1.380	8.620	6.896	1.724	1.506 ok	1475.9	0.148	1.654 ok	150	0.12	0.12	1.195	-1.046 Decreased
BW24/0219	Ohoka Service Station 1992 Limite	4	15	12	10	-1.714	8.286	6.629	1.657	0.775 ok	1479.8	0.148	0.923 ok	150	0	0	0.788	-0.640 Decreased
BW24/0528	C Summers	27	27	22.5	20.5	-1.816	18.684	14.947	3.737	0.000 ok	1480.6	0.148	0.148 ok	150	0.12	0.12	0.139	0.009 Increased
M35/0616	A D & E H CORNISH	12.8	15	12	10	-1.440	8.560	6.848	1.712	0.150 ok	1485.6	0.147	0.298 ok	150	0	0	0.195	-0.048 Decreased
M35/4752	MAUGER S.W. & M.J.	7.6	15	12	10	-1.770	8.230	6.584	1.646	0.216 ok	1497.2	0.146	0.361 ok	150	0.12	0.12	0.142	0.004 Increased
M35/9635	MR & MRS D J & K A MCKENZIE	17.86	17.86	15.36	13.36	-1.250	12.110	9.688	2.422	0.000 ok	1500.0	0.145	0.145 ok	150	0.12	0.12	0.288	-0.143 Decreased
M35/5134	MURRAY IMPLEMENTS CO.	0	15	12	10	-1.790	8.210	6.568	1.642	1.132 ok	1504.5	0.145	1.276 ok	150	0.12	0.12	0.942	-0.797 Decreased
M35/4790	WALLS C.A.S.	10.2	15	12	10	-1.290	8.710	6.968	1.742	0.827 ok	1507.4	0.144	0.971 ok	150	0.12	0.12	0.832	-0.688 Decreased
M35/4794	HEATLEY K.	6.1	15	12	10	-1.290	8.710	6.968	1.742	0.827 ok	1507.4	0.144	0.971 ok	150	0.12	0.12	0.832	-0.688 Decreased
M35/4841	MAUNSELL R. & J.L.	6.1	15	12	10	-1.290	8.710	6.968	1.742	0.827 ok	1507.4	0.144	0.971 ok	150	0.12	0.12	0.832	-0.688 Decreased
M35/4737	Messrs J G & G B van't Veen	27.85	27.85	23.05	21.05	-4.190	16.860	13.488	3.372	0.371 ok	1508.4	0.144	0.515 ok	150	0.9	0.9	0.214	-0.070 Decreased
M35/0676	BEZZANT AM & JM	15.5	15.5	12.5	10.5	-7.320	3.180	2.544	0.636	0.201 ok	1509.3	0.144	0.345 ok	150	0.12	0.12	0.181	-0.037 Decreased
M35/8606	BURNEY RT	24.8	24.8	23.27	21.27	-3.920	17.350	13.880	3.470	0.505 ok	1512.3	0.144	0.649 ok	150	0.12	0.12	0.233	-0.089 Decreased
M35/0617	Mr & Mrs P W & G A Kimber	13.1	15	12	10	-2.240	7.760	6.208	1.552	0.127 ok	1515.4	0.143	0.270 ok	150	0.9	0.52	0.141	0.002 Increased
M35/7619	Ohoka Utilities Limited	26.77	26.77	23.77	21.77	-4.320	17.450	13.960	3.490	1.503 ok	1521.4	0.142	1.645 ok	150	12.5	9.43	0.416	-0.274 Decreased
M35/4785	THACKWELL G.M.	6.1	15	12	10	-1.440	8.560	6.848	1.712	1.864 Exceeded	1525.0	0.142	2.006 Exceeded	150	0.12	0.12	1.162	-1.020 Decreased
M35/4788	WRAPSON J.	0	15	12	10	-1.912	8.088	6.471	1.618	1.864 Exceeded	1525.0	0.142	2.006 Exceeded	150	0.12	0.12	1.162	-1.020 Decreased
BW24/0334	Russell Pegler	24	24	23	21	-1.548	19.452	15.562	3.890	0.000 ok	1532.0	0.141	0.141 ok	150	0.12	0.12	0.220	-0.080 Decreased
M35/2918	A D & E H CORNISH	8.5	15	12	10	-1.410	8.590	6.872	1.718	0.129 ok	1532.3	0.141	0.270 ok	150	0.12	0.12	0.190	-0.049 Decreased
M35/8311	HENDREN LP & GJ	18	18	16.5	14.5	-1.920	12.580	10.064	2.516	0.118 ok	1534.6	0.141	0.259 ok	150	0.12	0.12	0.135	0.006 Increased
BW24/0520	Tim Baker	11.22	15	12	10	-1.745	8.255	6.604	1.651	0.953 ok	1536.1	0.140	1.093 ok	150	0.12	0.12	0.839	-0.699 Decreased
M35/4795	WaterForce Rangiora	13.8	15	12	10	-1.140	8.860	7.088	1.772	1.152 ok	1536.2	0.140	1.293 ok	150	0.12	0.12	0.930	-0.789 Decreased
M35/2920	RICHARDS M.E.	10.6	15	12	10	-2.330	7.670	6.136	1.534	0.167 ok	1536.5	0.140	0.308 ok	150	0.12	0.12	0.155	-0.015 Decreased
M35/9643	Mr BW Magee & Mrs R McCourt	17.5	17.5	15.5	13.5	-1.300	12.200	9.760	2.440	0.000 ok	1537.9	0.140	0.140 ok	150	0.12	0.12	0.233	-0.093 Decreased
M35/3247	VERKERK SETTLEMENT	9.1	15	12	10	-1.580	8.420	6.736	1.684	2.500 Exceeded	1542.1	0.140	2.640 Exceeded	150	0.12	0.12	1.102	-0.962 Decreased
M35/3308	CROFT W.D.	17.2	17.2	14.2	12.2	-1.630	10.570	8.456	2.114	0.227 ok	1544.2	0.139	0.366 ok	150	0	0	0.145	-0.006 Decreased
M35/10524	Mr & Ms BR & DV Hickling & Sincla	25.9	25.9	23.9	21.9	-4.250	17.650	14.120	3.530	0.764 ok	1549.5	0.139	0.903 ok	150	0.12	0.12	0.246	-0.108 Decreased
M35/10219	Mr & Mrs IJ & BJ Giles	17.55	17.55	16.55	14.55	-1.850	12.700	10.160	2.540	0.148 ok	1550.5	0.139	0.287 ok	150	0.12	0.12	0.126	0.012 Increased

BW24/0262	Waimakariri District Council	84.7	84.7	78	76	-1.950	74.050	59.240	14.810	0.000 ok	1550.6	0.384	0.384 ok	150	18	18	#N/A	#N/A	#N/A
M35/5147	BOULTON I.W.	12	15	12	10	-1.350	8.650	6.920	1.730	1.277 ok	1556.5	0.138	1.415 ok	150	0.12	0.12	1.000	-0.862	Decreased
M35/0385	FLINTOFT W.L.	6.5	15	12	10	-1.260	8.740	6.992	1.748	0.769 ok	1560.1	0.137	0.906 ok	150	0.12	0.12	0.728	-0.590	Decreased
M35/9602	MR & MRS J D & K A MCKENZIE	17.4	17.4	15.4	13.4	-1.170	12.230	9.784	2.446	0.000 ok	1562.3	0.137	0.137 ok	150	0.12	0.12	0.335	-0.198	Decreased
M35/0611	MEHRTENS G	12.2	15	12	10	-1.460	8.540	6.832	1.708	0.121 ok	1564.1	0.137	0.258 ok	150	0.12	0.12	0.128	0.008	Increased
M35/8160	Ohoka Utilities Limited	28.7	28.7	25.8	23.8	-4.030	19.770	15.816	3.954	1.242 ok	1565.1	0.137	1.379 ok	150	15	15	0.386	-0.250	Decreased
M35/6795	AIKIN GW	18	18	16	14	-1.860	12.140	9.712	2.428	0.110 ok	1573.1	0.136	0.246 ok	150	0.12	0.12	0.123	0.012	Increased
M35/4768	Southern Chicks Limited	14.3	15	12	10	-2.570	7.430	5.944	1.486	1.860 Exceeded	1592.8	0.133	1.993 Exceeded	150	0.29	0.29	0.524	-0.390	Decreased
M35/3307	CROFT W.D.	17	17	14	12	-1.650	10.350	8.280	2.070	0.128 ok	1603.8	0.132	0.260 ok	150	0	0	0.131	0.000	Increased
M35/0387	REGNAULT C.R.	6	15	12	10	-1.500	8.500	6.800	1.700	2.451 Exceeded	1604.0	0.132	2.582 Exceeded	150	0.12	0.12	1.087	-0.955	Decreased
M35/17681	SOUTHERN CROSS TRUFFLES LIM	24.1	24.1	21.74	19.74	-3.950	15.790	12.632	3.158	0.122 ok	1606.4	0.132	0.254 ok	150	0.12	0.12	0.115	0.017	Increased
M35/3042	EYRE C.C.	6.1	15	12	10	-1.130	8.870	7.096	1.774	0.486 ok	1608.9	0.131	0.617 ok	150	0	0	0.448	-0.317	Decreased
M35/4744	ARMSTRONG M.A. & G.G.	0	15	12	10	-1.581	8.419	6.735	1.684	0.718 ok	1617.3	0.130	0.848 ok	150	0.12	0.12	0.640	-0.510	Decreased
M35/4770	DELLOW P.K.	0	15	12	10	-1.916	8.084	6.467	1.617	1.828 Exceeded	1623.6	0.129	1.958 Exceeded	150	0.12	0.12	1.031	-0.901	Decreased
M35/7701	HJ SMITH	86	86	84	82	-0.980	81.020	64.816	16.204	0.934 ok	1627.1	0.344	1.278 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/6895	RICHARDS M.E.	20	20	17	15	-2.370	12.630	10.104	2.526	0.163 ok	1630.2	0.129	0.292 ok	150	0.12	0.12	0.139	-0.010	Decreased
M35/8539	OHOKA PARK TRUST	18	18	16.5	14.5	-1.680	12.820	10.256	2.564	0.000 ok	1652.6	0.126	0.126 ok	150	0.12	0.12	0.108	0.018	Increased
BW24/0364	Gabe Rijpma	14.1	15	12	10	-1.725	8.275	6.620	1.655	0.870 ok	1654.0	0.126	0.996 ok	150	0.12	0.12	0.767	-0.641	Decreased
M35/7368	IRRIGATION PUMPING SERVICES	17	17	14	12	-1.570	10.430	8.344	2.086	0.236 ok	1661.2	0.125	0.361 ok	150	0.12	0.12	0.130	-0.005	Decreased
M35/5308	DORNABELL W.P. (EX SEELEN)	16.4	16.4	13.4	11.4	-2.420	8.980	7.184	1.796	0.314 ok	1662.9	0.125	0.439 ok	150	0.12	0.12	0.156	-0.031	Decreased
M35/6894	RICHARDS M.E.	20	20	17	15	-2.350	12.650	10.120	2.530	0.143 ok	1663.4	0.125	0.268 ok	150	0.12	0.12	0.125	0.000	Decreased
M35/4722	Wicklow Farming Limited	12	15	12	10	-1.530	8.470	6.776	1.694	1.696 Exceeded	1663.8	0.125	1.821 Exceeded	150	22.57	22.57	1.002	-0.878	Decreased
M35/4745	ARMSTRONG M.A. & G.G.	0	15	12	10	-1.880	8.120	6.496	1.624	1.537 ok	1667.1	0.124	1.661 Exceeded	150	0.12	0.12	0.928	-0.803	Decreased
M35/4743	ARMSTRONG M.A. & G.G.	13.7	15	12	10	-1.170	8.830	7.064	1.766	0.593 ok	1669.8	0.124	0.717 ok	150	0.12	0.12	0.506	-0.382	Decreased
M35/10220	Mr & Mrs JJ & BJ Giles	17.8	17.8	16.8	14.8	-1.910	12.890	10.312	2.578	0.108 ok	1676.4	0.123	0.231 ok	150	0.12	0.12	0.108	0.015	Increased
M35/6893	RICHARDS M.E.	20	20	17	15	-2.320	12.680	10.144	2.536	0.127 ok	1677.8	0.123	0.250 ok	150	0.12	0.12	0.117	0.006	Increased
M35/8343	AIKIN GW MK	14	15	12	10	-1.890	8.110	6.488	1.622	0.324 ok	1678.0	0.123	0.447 ok	150	0.12	0.12	0.106	0.017	Increased
M35/2624	JOHNSON LHM	16.56	16.56	13.56	11.56	-1.290	10.270	8.216	2.054	0.117 ok	1679.3	0.123	0.240 ok	150	0	0	0.184	-0.061	Decreased
BW24/0095	WICKLOW FARMING LTD	50	50	47	45	-2.048	42.952	34.361	8.590	1.924 ok	1688.0	0.315	2.240 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/7198	BROWN K.T.	16	16	13	11	-2.030	8.970	7.176	1.794	0.000 ok	1690.7	0.122	0.122 ok	150	0.12	0.12	0.102	0.019	Increased
M35/4732	SINCOCK G.J.	15.2	15.2	12.2	10.2	-1.950	8.250	6.600	1.650	0.207 ok	1699.5	0.121	0.327 ok	150	0.12	0.12	0.102	0.019	Increased
M35/6892	RICHARDS M.E.	20	20	17	15	-2.290	12.710	10.168	2.542	0.114 ok	1703.3	0.120	0.234 ok	150	0.12	0.12	0.109	0.011	Increased
BW24/0560	Graham Brown	11.7	15	12	10	-1.529	8.471	6.777	1.694	0.000 ok	1717.3	0.119	0.119 ok	150	0.12	0.12	0.218	-0.100	Decreased
BW24/0139	MR H B & MRS J K BELL	18	18	15	13	-3.245	9.755	7.804	1.951	0.108 ok	1717.8	0.118	0.226 ok	150	0.12	0.12	0.106	0.013	Increased
M35/7205	TONKIN G.D. & S.A.	12	15	12	10	-1.240	8.760	7.008	1.752	0.112 ok	1718.2	0.118	0.231 ok	150	0.12	0.12	0.192	-0.073	Decreased
M35/8399	LYNN RJ	10.5	15	12	10	-1.240	8.760	7.008	1.752	0.771 ok	1721.1	0.118	0.889 ok	150	0.12	0.12	0.627	-0.509	Decreased
M35/9603	MR & MRS J D & K A MCKENZIE	17.7	17.7	15.7	13.7	-1.140	12.560	10.048	2.512	0.107 ok	1728.0	0.117	0.224 ok	150	0.12	0.12	0.254	-0.137	Decreased
M35/0683	MEREDITH A (EX MCINTYRE)	11.8	15	12	10	-2.570	7.430	5.944	1.486	0.476 ok	1732.7	0.117	0.593 ok	150	0.12	0.12	0.170	-0.053	Decreased
M35/4741	SCOTT J.H.	9.1	15	12	10	-2.790	7.210	5.768	1.442	2.403 Exceeded	1737.1	0.116	2.519 Exceeded	150	0.12	0.12	0.640	-0.524	Decreased
M35/1834	MEREDITH A (EX MCINTYRE)	20.3	20.3	17.2	15.2	-4.380	10.820	8.656	2.164	0.478 ok	1745.3	0.115	0.594 ok	150	0	0	0.170	-0.054	Decreased
M35/9071	Watson AA	12	15	12	10	-0.900	9.100	7.280	1.820	0.797 ok	1747.4	0.115	0.912 ok	150	0	0	0.547	-0.431	Decreased
M35/6891	RICHARDS M.E.	19.5	19.5	17.4	15.4	-2.280	13.120	10.496	2.624	0.103 ok	1751.0	0.115	0.218 ok	150	0.12	0.12	0.100	0.015	Increased
M35/8414	SANDERS SW & LR	17.8	17.8	16.4	14.4	-2.760	11.640	9.312	2.328	1.918 ok	1751.7	0.115	2.033 ok	150	0.12	0.12	0.378	-0.263	Decreased
M35/4726	MARSHALL J.J.	5.7	15	12	10	-1.090	8.910	7.128	1.782	0.116 ok	1751.9	0.115	0.231 ok	150	0.12	0.12	0.304	-0.190	Decreased
M35/4678	MCINTYRE J.L.	20.1	20.1	17.1	15.1	-4.340	10.760	8.608	2.152	1.442 ok	1752.1	0.115	1.557 ok	150	0.12	0.12	0.297	-0.182	Decreased
M35/11074	MACRAE LAND COMPANY	17.7	17	15.5	13.5	-0.830	12.670	10.136	2.534	0.650 ok	1763.5	0.113	0.763 ok	150	0.12	0.12	0.435	-0.322	Decreased
M35/4681	SANDERS E.W. & T.J.	12.8	15	12	10	-2.750	7.250	5.800	1.450	2.132 Exceeded	1767.2	0.113	2.245 Exceeded	150	0.12	0.12	0.397	-0.284	Decreased
M35/8381	Marilyn Brown	88	88	86.5	84.5	-1.040	83.460	66.768	16.692	1.196 ok	1777.8	0.278	1.475 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/4552	Mr & Mrs D K & E C Purvis	9	15	12	10	-2.860	7.140	5.712	1.428	2.242 Exceeded	1785.0	0.111	2.353 Exceeded	150	3.8	3.8	0.598	-0.487	Decreased
M35/5298	NEATE K.C.	19.8	19.8	16.8	14.8	-2.510	12.290	9.832	2.458	0.441 ok	1795.0	0.110	0.551 ok	150	0.12	0.12	0.142	-0.032	Decreased
M35/3019	MacRae Land Company Limited	15.4	15.4	12.4	10.4	-1.060	9.340	7.472	1.868	0.325 ok	1796.2	0.110	0.435 ok	150	0	0	0.333	-0.223	Decreased
BW23/0334	Simon Family Trust	29.39	29.39	27.89	25.89	-3.601	22.289	17.831	4.458	0.440 ok	1799.5	0.110	0.549 ok	150	0.12	0.12	0.141	-0.031	Decreased
M35/11075	MACRAE LAND COMPANY	20	20	17	15	-1.070	13.930	11.144	2.786	0.432 ok	1802.4	0.109	0.541 ok	150	0.12	0.12	0.344	-0.235	Decreased
M35/4735	GOTTERMAYER (EX FROST)	8.2	15	12	10	-2.010	7.990	6.392	1.598	0.327 ok	1806.3	0.109	0.436 ok	150	0.12	0.12	0.087	0.022	Increased
BW24/0251	Michael Hussey	50	50	45.1	43.1	-0.820	42.280	33.824	8.456	0.584 ok	1809.7	0.266	0.851 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/9916	Mr & Mrs D L & S M Scott	24	24	18	16	-4.230	11.770	9.416	2.354	0.147 ok	1810.6	0.108	0.255 ok	150	0.12	0.12	0.099	0.010	Increased
M35/5972	Mr & Mrs J D & K A McKenzie	13.9	15	12	10	-1.160	8.840	7.072	1.768	0.000 ok	1811.5	0.108	0.108 ok	150	0.12	0.12	0.199	-0.090	Decreased
M35/4377		11.5	15	12	10	-2.450	7.550	6.040	1.510	0.261 ok	1817.6	0.108	0.369 ok	150	0.12	0.12	0.102	0.006	Increased
M35/11063	MR & MRS EJ & JR GRAHAM	25	25	22	20	-4.400	15.600	12.480	3.120	2.026 ok	1823.8	0.107	2.133 ok	150	0.12	0.12	0.443	-0.336	Decreased

M35/4717	IRELAND W.P.&F.W.	9.1	15	12	10	-1.320	8.680	6.944	1.736	1.167 ok	1825.7	0.107	1.274 ok	150	0.12	0.12	0.708	-0.601 Decreased	
M35/7909	MOORE EH	20	20	17	15	-1.440	13.560	10.848	2.712	1.759 ok	1829.9	0.106	1.865 ok	150	0.12	0.12	0.802	-0.695 Decreased	
M35/11077	MACRAE LAND COMPANY	18	18	16.5	14.5	-0.740	13.760	11.008	2.752	0.330 ok	1838.9	0.105	0.436 ok	150	0.12	0.12	0.308	-0.202 Decreased	
M35/10624	MR J D MCKENZIE	20.5	20.5	18.5	16.5	-3.840	12.660	10.128	2.532	0.151 ok	1845.0	0.105	0.256 ok	150	0.12	0.12	0.140	-0.035 Decreased	
M35/3072	Dr T B Taylor	19	19	16	14	-2.480	11.520	9.216	2.304	0.281 ok	1853.3	0.104	0.385 ok	150	2	2	0.101	0.003 Increased	
M35/4740	CAMERON J G (EX WARD F.J)	0	15	12	10	-1.854	8.146	6.517	1.629	2.649 Exceeded	1857.6	0.104	2.753 Exceeded	150	0.12	0.12	0.683	-0.579 Decreased	
BW24/0427	Ohoka School	17.35	17.35	15.85	13.85	-1.488	12.362	9.890	2.472	0.116 ok	1874.6	0.102	0.218 ok	150	0.12	0.12	0.203	-0.101 Decreased	
M35/10221	Mr & Mrs IJ & BJ Giles	17.58	17.58	16.58	14.58	-1.990	12.590	10.072	2.518	0.229 ok	1877.0	0.102	0.331 ok	150	0.12	0.12	0.066	0.036 Increased	
M35/8170	Mr & Mrs D B & C R Pugh	11.92	15	12	10	-1.150	8.850	7.080	1.770	0.103 ok	1881.5	0.101	0.204 ok	150	1.5	1.5	0.175	-0.074 Decreased	
M35/4771	CROZIER N.J.	6.7	15	12	10	-1.060	8.940	7.152	1.788	0.141 ok	1892.4	0.100	0.241 ok	150	0.12	0.12	0.234	-0.134 Decreased	
M35/8935	Mr M K & Mrs S M Sinclair	18	18	17	15	-2.100	12.900	10.320	2.580	0.222 ok	1893.2	0.100	0.322 ok	150	2.08	2.01	0.071	0.029 Increased	
M35/11227	KAVANAGH FAMILY TRUST	18	18	17	15	-2.590	12.410	9.928	2.482	2.137 ok	1908.5	0.000	2.137 ok	0	0.12	0.12	0.374	-0.374 Decreased	
M35/6268	A Verkerk Limited	12	15	12	10	-0.300	9.700	7.760	1.940	1.840 ok	1921.5	0.000	1.840 ok	0	17.5	15.55	0.679	-0.679 Decreased	
M35/6008	HUTHINSON GK & MT	15	15	14	12	-2.070	9.930	7.944	1.986	0.475 ok	1934.2	0.000	0.475 ok	0	0.12	0.12	0.064	-0.064 Decreased	
M35/0609	SCHOOL	6.7	15	12	10	-1.060	8.940	7.152	1.788	0.141 ok	1952.4	0.000	0.141 ok	0	0	0	0.202	-0.202 Decreased	
M35/4719	POWER G.J.	8.5	15	12	10	-1.590	8.410	6.728	1.682	2.510 Exceeded	1952.7	0.000	2.510 Exceeded	0	0.12	0.12	0.665	-0.665 Decreased	
M35/6468	Mr & Mrs A T & J R Cox	19.3	19.3	16.3	14.3	-2.540	11.760	9.408	2.352	0.323 ok	1957.0	0.000	0.323 ok	0	2.9	2.35	0.087	-0.087 Decreased	
M35/7997	SHIINO Y & Y	24	24	22.5	20.5	-4.640	15.860	12.688	3.172	0.471 ok	1966.2	0.000	0.471 ok	0	0.12	0.12	0.119	-0.119 Decreased	
M35/4776	JOHNSON L.H.M.	6.7	15	12	10	-1.240	8.760	7.008	1.752	0.232 ok	1966.9	0.000	0.232 ok	0	0.12	0.12	0.125	-0.125 Decreased	
M35/8936	Mr M K & Mrs S M Sinclair	18	18	17	15	-2.140	12.860	10.288	2.572	0.225 ok	1968.0	0.000	0.225 ok	0	0.12	0.12	0.066	-0.066 Decreased	
M35/10169	Mr & Mrs SJ & TA Duff	18	18	15	13	-3.267	9.733	7.786	1.947	0.336 ok	1968.4	0.000	0.336 ok	0	0.12	0.12	0.062	-0.062 Decreased	
M35/4720	MOORE E.H.	5.4	15	12	10	-1.350	8.650	6.920	1.730	1.171 ok	1968.5	0.000	1.171 ok	0	0.12	0.12	0.628	-0.628 Decreased	
M35/5677	K & D Taane	95.2	95.2	92.2	90.2	-4.260	85.940	68.752	17.188	0.893 ok	1970.5	0.214	1.108 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/11372	MR & MRS IJ & BJ GILES	17.85	17.85	16.35	14.35	-2.000	12.350	9.880	2.470	0.258 ok	1977.0	0.000	0.258 ok	0	0.12	0.12	0.057	-0.057 Decreased	
M35/18131	MR JG & MRS S J VAN T VEEN	23.5	23.5	22.81	20.81	-4.760	16.050	12.840	3.210	0.351 ok	1984.1	0.000	0.351 ok	0	0.12	0.12	0.102	-0.102 Decreased	
M35/10625	MR J D MCKENZIE	20	20	18	16	-1.280	14.720	11.776	2.944	0.161 ok	1984.1	0.000	0.161 ok	0	0.12	0.12	0.115	-0.115 Decreased	
M35/11286	Macrae Land Company	15.3	15.3	14.3	12.3	-0.740	11.560	9.248	2.312	0.481 ok	1989.0	0.000	0.481 ok	0	0.12	0.12	0.295	-0.295 Decreased	
BW24/0778	Matthew Hobbs	18	18	16.17	14.17	-3.718	10.452	8.362	2.090	0.231 ok	1996.2	0.000	0.231 ok	0	0.12	0.12	0.068	-0.068 Decreased	

Input file used Bore Location 5.prm

Model Parameters for drawdown calculations

Standard Screen Length :3m

Standard Pump Length :2m

Depth Range of pumped Aquifer taken from 31m till 999m

Transmissivity 115 m2/d

Storativity 0.00063

Leakage 660 OR 0.0003 KB

Sigma 0.1

T0 975 m2/d

WellNo	Owner	Depth	AdoptDepth	Top_Screen	CutOff	Calc80Min	Available	Protected	DD4Interference	CumDD	OkCumDD	VIR/0001_Dist	VIR/0001_DDA	VIR/0001_DD	VIR/0001_DDOK	VIR/0001_DomP	Q7	Q150	Existing DD	Change	Result
VIR/0001		84	84	81	79	-2.230	76.770	61.416	15.354	0.925 ok		0.0	0.000	0.925 ok		0	28.96	28.96	#N/A	#N/A	#N/A
M35/0596	Canterbury Regional Council	2.9	15	12	10	-0.750	9.250	7.400	1.850	1.624 ok		406.7	0.340	1.964 Exceeded		150	0.12	0.12	1.357	-1.017	Decreased
M35/0305	LESLIE D.H. & M.A.	5.8	15	12	10	-1.550	8.450	6.760	1.690	1.924 Exceeded		419.4	0.338	2.262 Exceeded		150	0.12	0.12	1.416	-1.078	Decreased
M35/3066	MASON W.I.G.	6.7	15	12	10	-1.720	8.280	6.624	1.656	1.464 ok		452.7	0.331	1.795 Exceeded		150	0.12	0.12	1.612	-1.281	Decreased
M35/4746	VERKERK A.	9.1	15	12	10	-1.610	8.390	6.712	1.678	2.062 Exceeded		483.6	0.325	2.387 Exceeded		150	0.12	0.12	1.240	-0.915	Decreased
M35/0367	Mr & Mrs P J & R J Sherriff	9.4	15	12	10	-1.480	8.520	6.816	1.704	2.091 Exceeded		547.3	0.312	2.403 Exceeded		150	0	0	0.771	-0.459	Decreased
M35/3064	Mr & Mrs P J & R J Sherriff	12.5	15	12	10	-1.810	8.190	6.552	1.638	1.443 ok		570.5	0.307	1.750 Exceeded		150	0	0	1.094	-0.787	Decreased
M35/6181	WALKER D.J.	12	15	12	10	-1.560	8.440	6.752	1.688	0.417 ok		585.5	0.304	0.721 ok		150	0.12	0.12	0.909	-0.606	Decreased
M35/9423	Mr & Mrs P J & R J Sherriff	30	30	27	25	-2.201	22.799	18.239	4.560	0.351 ok		610.5	0.299	0.650 ok		150	0	0	0.645	-0.346	Decreased
M35/4554	A Verkerk Limited	7.5	15	12	10	-1.600	8.400	6.720	1.680	1.927 Exceeded		613.2	0.298	2.225 Exceeded		150	11.88	11.88	1.167	-0.869	Decreased
M35/5609	Waimakariri District Council	18.8	18.8	16.8	14.8	-1.480	13.320	10.656	2.664	1.466 ok		668.4	0.287	1.753 ok		150	18	18	1.349	-1.062	Decreased
M35/3065	Mr & Mrs P J & R J Sherriff	12	15	12	10	-1.900	8.100	6.480	1.620	1.573 ok		678.2	0.285	1.858 Exceeded		150	0	0	1.047	-0.762	Decreased
M35/3306	Merv Emms	17	17	14	12	-1.580	10.420	8.336	2.084	0.348 ok		680.0	0.285	0.632 ok		150	3	3	0.926	-0.641	Decreased
M35/6688	MASON W.I.G.	18	18	15	13	-1.900	11.100	8.880	2.220	1.513 ok		680.1	0.285	1.798 ok		150	0.12	0.12	1.864	-1.579	Decreased
M35/4723	ARMITAGE P.L.	0	15	12	10	-2.125	7.875	6.300	1.575	0.485 ok		680.1	0.285	0.769 ok		150	0.12	0.12	0.819	-0.535	Decreased
M35/0326	Mr & Mrs P J & R J Sherriff	13.7	15	12	10	-1.390	8.610	6.888	1.722	1.403 ok		684.6	0.284	1.687 ok		150	0	0	0.665	-0.382	Decreased
M35/4747	LESLIE D.H. & M.A.	5.4	15	12	10	-1.400	8.600	6.880	1.720	1.508 ok		688.7	0.283	1.791 Exceeded		150	0.12	0.12	1.540	-1.257	Decreased
M35/0388	WALLS G.D.	0	15	12	10	-2.171	7.829	6.263	1.566	1.823 Exceeded		711.8	0.278	2.101 Exceeded		150	0.12	0.12	1.298	-1.020	Decreased
M35/4724	ALEXANDER	13.5	15	12	10	-1.450	8.550	6.840	1.710	0.439 ok		713.5	0.278	0.717 ok		150	0	0	0.783	-0.505	Decreased
M35/3247	VERKERK SETTLEMENT	9.1	15	12	10	-1.580	8.420	6.736	1.684	2.500 Exceeded		751.1	0.270	2.770 Exceeded		150	0.12	0.12	1.102	-0.832	Decreased
M35/4782	BISMAN I.W.	20.4	20.4	20.4	18.4	-4.150	14.250	11.400	2.850	1.443 ok		758.5	0.269	1.712 ok		150	0.12	0.12	1.399	-1.130	Decreased
M35/3032	Kate Mullins	19.7	19.7	16.7	14.7	-1.690	13.010	10.408	2.602	0.208 ok		790.6	0.263	0.471 ok		150	0.12	0.12	0.867	-0.605	Decreased
M35/4785	THACKWELL G.M.	6.1	15	12	10	-1.440	8.560	6.848	1.712	1.864 Exceeded		800.1	0.261	2.125 Exceeded		150	0.12	0.12	1.162	-0.901	Decreased
M35/4788	WRAPSON J.	0	15	12	10	-2.180	7.820	6.256	1.564	1.864 Exceeded		800.1	0.261	2.125 Exceeded		150	0.12	0.12	1.162	-0.901	Decreased
M35/7754	WILKINSON PB	24	24	23	21	-3.720	17.280	13.824	3.456	0.476 ok		803.0	0.260	0.736 ok		150	0.12	0.12	0.750	-0.489	Decreased
M35/8112	Walker DJH and CM	20.25	20.25	18.25	16.25	-3.970	12.280	9.824	2.456	0.331 ok		805.4	0.260	0.590 ok		150	0.12	0.12	0.744	-0.484	Decreased
BW24/0262	Waimakariri District Council	84.7	84.7	78	76	-2.194	73.806	59.045	14.761	0.000 ok		805.5	1.267	1.267 ok		150	18	18	#N/A	#N/A	#N/A
M35/0320	OFFWOOD D.	9.1	15	12	10	-1.310	8.690	6.952	1.738	0.903 ok		818.8	0.257	1.160 ok		150	0.12	0.12	0.950	-0.693	Decreased
M35/0386	LESLIE D.H. & M.A.	4	15	12	10	-1.380	8.620	6.896	1.724	1.506 ok		829.9	0.255	1.761 Exceeded		150	0.12	0.12	1.195	-0.940	Decreased
M35/0387	REGNAULT C.R.	6	15	12	10	-1.500	8.500	6.800	1.700	2.451 Exceeded		831.6	0.255	2.705 Exceeded		150	0.12	0.12	1.087	-0.832	Decreased
M35/6483	GRAINGER P.	20	20	18	16	-1.830	14.170	11.336	2.834	0.115 ok		859.4	0.249	0.364 ok		150	0.12	0.12	0.809	-0.560	Decreased
M35/4772	Robin Ames	0	15	12	10	-2.113	7.887	6.310	1.577	0.000 ok		864.6	0.248	0.248 ok		150	0.12	0.12	0.801	-0.552	Decreased
M35/4722	Wicklow Farming Limited	12	15	12	10	-1.530	8.470	6.776	1.694	1.696 Exceeded		878.2	0.246	1.942 Exceeded		150	22.57	22.57	1.002	-0.757	Decreased
M35/18188	MR M P EMMS	18	18	16.86	14.86	-1.240	13.620	10.896	2.724	0.101 ok		883.1	0.245	0.346 ok		150	0.12	0.12	0.724	-0.479	Decreased
M35/4770	DELLOW P.K.	0	15	12	10	-2.186	7.814	6.251	1.563	1.828 Exceeded		890.8	0.243	2.072 Exceeded		150	0.12	0.12	1.031	-0.787	Decreased
M35/8951	J D & K A McKenzie	18.05	18.05	16.05	14.05	-1.460	12.590	10.072	2.518	0.352 ok		892.7	0.243	0.595 ok		150	0.12	0.12	0.653	-0.410	Decreased
BW24/0095	WICKLOW FARMING LTD	50	50	47	45	-2.276	42.724	34.180	8.545	1.924 ok		896.8	1.077	3.001 ok		150	0.12	0.12	#N/A	#N/A	#N/A
M35/7533	LYALL T.M	6	15	12	10	-1.310	8.690	6.952	1.738	1.100 ok		903.9	0.241	1.341 ok		150	0	0	0.967	-0.726	Decreased
M35/4789	MURRAY IMPLEMENTS	13.7	15	12	10	-1.310	8.690	6.952	1.738	1.110 ok		915.0	0.239	1.349 ok		150	0.12	0.12	0.962	-0.723	Decreased
M35/5147	BOULTON I.W.	12	15	12	10	-1.350	8.650	6.920	1.730	1.277 ok		934.8	0.235	1.512 ok		150	0.12	0.12	1.000	-0.765	Decreased
M35/5134	MURRAY IMPLEMENTS CO.	0	15	12	10	-2.047	7.953	6.363	1.591	1.132 ok		944.2	0.233	1.365 ok		150	0.12	0.12	0.942	-0.709	Decreased
M35/4428	HARRIS I.R.	19.4	19.4	16.4	14.4	-1.910	12.490	9.992	2.498	0.257 ok		948.0	0.233	0.490 ok		150	0.12	0.12	0.757	-0.525	Decreased
M35/9600	MR & MRS J D & K A MCKENZIE	17.53	17.53	15.53	13.53	-1.410	12.120	9.696	2.424	0.361 ok		952.8	0.232	0.593 ok		150	0.12	0.12	0.617	-0.385	Decreased
BW24/0216	Ohoka Service Station 1992 Limited	4	15	12	10	-1.984	8.016	6.412	1.603	0.800 ok		962.1	0.230	1.030 ok		150	0	0	0.845	-0.615	Decreased
M35/4795	WaterForce Rangiora	13.8	15	12	10	-1.140	8.860	7.088	1.772	1.152 ok		962.8	0.230	1.382 ok		150	0.12	0.12	0.930	-0.700	Decreased
M35/7073	WALKER D.J.H. & C.M.	18.8	18.8	16.8	14.8	-1.530	13.270	10.616	2.654	0.106 ok		969.1	0.229	0.334 ok		150	0.12	0.12	0.610	-0.381	Decreased
M35/4738	A. Smith	13.7	15	12	10	-1.780	8.220	6.576	1.644	0.319 ok		971.4	0.228	0.548 ok		150	0.12	0.12	0.697	-0.469	Decreased
BW24/0218	Ohoka Service Station 1992 Limited	4	15	12	10	-1.974	8.026	6.421	1.605	0.784 ok		975.4	0.228	1.011 ok		150	0	0	0.822	-0.595	Decreased
BW24/0217	Ohoka Service Station 1992 Limited	4	15	12	10	-1.968	8.032	6.426	1.606	0.778 ok		984.3	0.226	1.004 ok		150	0	0	0.811	-0.585	Decreased
M35/9599	Mr & Mrs G.J & T.A Burbery	17.4	17.4	15.4	13.4	-1.370	12.030	9.624	2.406	0.370 ok		986.5	0.226	0.596 ok		150	0.12	0.12	0.602	-0.376	Decreased

M35/4745	ARMSTRONG M.A. & G.G.	0	15	12	10	-2.144	7.856	6.285	1.571	1.537 ok	987.7	0.225	1.763 Exceeded	150	0.12	0.12	0.928	-0.702 Decreased	
BW24/0215	Ohoka Service Station 1992 Limited	4	15	12	10	-1.948	8.052	6.442	1.610	0.786 ok	993.3	0.224	1.011 ok	150	0	0	0.810	-0.585 Decreased	
M35/4790	WALLS C.A.S.	10.2	15	12	10	-1.290	8.710	6.968	1.742	0.827 ok	999.2	0.223	1.050 ok	150	0.12	0.12	0.832	-0.609 Decreased	
M35/4794	HEATLEY K.	6.1	15	12	10	-1.290	8.710	6.968	1.742	0.827 ok	999.2	0.223	1.050 ok	150	0.12	0.12	0.832	-0.609 Decreased	
M35/4841	MAUNSELL R. & J.L.	6.1	15	12	10	-1.290	8.710	6.968	1.742	0.827 ok	999.2	0.223	1.050 ok	150	0.12	0.12	0.832	-0.609 Decreased	
M35/0389	EYRE C.C.	0	15	12	10	-1.953	8.047	6.437	1.609	0.690 ok	1006.2	0.222	0.912 ok	150	0	0	0.735	-0.513 Decreased	
M35/4792	OLSEN M.	9.1	15	12	10	-1.250	8.750	7.000	1.750	0.690 ok	1006.2	0.222	0.912 ok	150	0.12	0.12	0.735	-0.513 Decreased	
BW24/0520	Tim Baker	11.22	15	12	10	-1.975	8.025	6.420	1.605	0.953 ok	1008.2	0.222	1.175 ok	150	0.12	0.12	0.839	-0.618 Decreased	
BW24/0219	Ohoka Service Station 1992 Limited	4	15	12	10	-1.934	8.066	6.452	1.613	0.775 ok	1011.2	0.221	0.996 ok	150	0	0	0.788	-0.567 Decreased	
M35/7152	Glenalbany Deer Park Limited	15.5	15.5	12.5	10.5	-2.775	7.725	6.180	1.545	1.660 Exceeded	1014.5	0.221	1.880 Exceeded	150	3.95	2.77	0.992	-0.772 Decreased	
M35/6773	BLACK P.C.	24	24	22	20	-4.170	15.830	12.664	3.166	0.269 ok	1014.8	0.221	0.489 ok	150	0.12	0.12	0.706	-0.485 Decreased	
M35/2730	Mr A D & Ms A Smith	7.3	15	12	10	-1.780	8.220	6.576	1.644	0.104 ok	1015.5	0.220	0.324 ok	150	4	2.03	0.655	-0.435 Decreased	
M35/1836	Mr & Mrs RS & C R Scott	16.8	16.8	1	-1	-2.130	-3.130	-2.504	-0.626	0.107 Screen>>	1022.0	0.219	0.326 Exceeded	150	4.75	2.54	0.657	-0.438 Decreased	
M35/10517	Union Specialties (NZ) Limited	23.16	23.16	21.16	19.16	-4.300	14.860	11.888	2.972	1.850 ok	1029.7	0.218	2.068 ok	150	0.12	0.12	0.961	-0.743 Decreased	
M35/4979	Ms M E Hopkinson	20	20	17	15	-2.260	12.740	10.192	2.548	1.793 ok	1042.6	0.216	2.009 ok	150	15.71	10	0.897	-0.681 Decreased	
M35/5133	MARSHALL J.J.	20	20	17	15	-1.260	13.740	10.992	2.748	0.433 ok	1055.1	0.213	0.646 ok	150	0.12	0.12	0.608	-0.394 Decreased	
M35/4727	THIELE G.J.	9.1	15	12	10	-2.220	7.780	6.224	1.556	1.769 Exceeded	1060.9	0.212	1.982 Exceeded	150	0.12	0.12	0.929	-0.717 Decreased	
M35/7909	MOORE EH	20	20	17	15	-1.440	13.560	10.848	2.712	1.759 ok	1083.4	0.209	1.968 ok	150	0.12	0.12	0.802	-0.593 Decreased	
M35/0385	FLINTOFT W.L.	6.5	15	12	10	-1.260	8.740	6.992	1.748	0.769 ok	1086.0	0.208	0.977 ok	150	0.12	0.12	0.728	-0.520 Decreased	
BW24/0251	Michael Hussey	50	50	45.1	43.1	-0.820	42.280	33.824	8.456	0.584 ok	1088.5	0.779	1.363 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/5021	SCOTT R.S.	12.8	15	12	10	-1.820	8.180	6.544	1.636	0.218 ok	1094.0	0.207	0.424 ok	150	0.12	0.12	0.599	-0.392 Decreased	
BW24/0364	Gabe Rijpma	14.1	15	12	10	-1.942	8.058	6.446	1.612	0.870 ok	1097.8	0.206	1.076 ok	150	0.12	0.12	0.767	-0.561 Decreased	
M35/4730	RUTHERFORD K.A.	12.1	15	12	10	-1.610	8.390	6.712	1.678	0.000 ok	1099.4	0.206	0.206 ok	150	0.12	0.12	0.543	-0.338 Decreased	
M35/0595	W Power	18.3	18.3	6.8	4.8	-2.150	2.650	2.120	0.530	0.947 Exceeded	1103.7	0.205	1.152 Exceeded	150	4.9	4.9	0.783	-0.578 Decreased	
M35/7023	BLACK PC & KL	0	15	12	10	-2.294	7.706	6.164	1.541	0.130 ok	1108.0	0.204	0.334 ok	150	0.12	0.12	0.605	-0.401 Decreased	
M35/10520	Mr & Mrs RW & HI Southam	17.9	17.9	15.9	13.9	-1.220	12.680	10.144	2.536	0.433 ok	1119.2	0.202	0.635 ok	150	0.12	0.12	0.582	-0.379 Decreased	
M35/4740	CAMERON J G (EX WARD F.J.)	0	15	12	10	-2.068	7.932	6.345	1.586	2.649 Exceeded	1121.1	0.202	2.851 Exceeded	150	0.12	0.12	0.683	-0.481 Decreased	
M35/2728	Mr H C & Mrs J A de Boer	12.2	15	12	10	-1.670	8.330	6.664	1.666	0.000 ok	1128.9	0.201	0.201 ok	150	0	0	0.537	-0.337 Decreased	
M35/9637	MR & MRS D J & K A MCKENZIE	17.6	17.6	15.1	13.1	-1.440	11.660	9.328	2.332	0.000 ok	1136.0	0.200	0.200 ok	150	0.12	0.12	0.501	-0.301 Decreased	
M35/6587	WARREN AH & BL	15	15	12	10	-2.010	7.990	6.392	1.598	0.541 ok	1140.5	0.199	0.740 ok	150	0.12	0.12	0.644	-0.446 Decreased	
M35/6268	A Verkerk Limited	12	15	12	10	-0.300	9.700	7.760	1.940	1.840 ok	1142.8	0.199	2.038 Exceeded	150	17.5	15.55	0.679	-0.480 Decreased	
M35/9598	MR & MRS J D & K A MCKENZIE	17.28	17.28	15.28	13.28	-1.310	11.970	9.576	2.394	0.333 ok	1153.1	0.197	0.530 ok	150	0.12	0.12	0.509	-0.313 Decreased	
M35/9601	MR & MRS J D & K A MCKENZIE	23.5	23.5	21.5	19.5	-4.010	15.490	12.392	3.098	0.333 ok	1153.1	0.197	0.530 ok	150	0.12	0.12	0.509	-0.313 Decreased	
M35/9638	MR & MRS D J & K A MCKENZIE	17.82	17.82	15.32	13.32	-1.380	11.940	9.552	2.388	0.104 ok	1157.3	0.196	0.300 ok	150	0.12	0.12	0.493	-0.297 Decreased	
M35/4719	POWER G.J.	8.5	15	12	10	-1.590	8.410	6.728	1.682	2.510 Exceeded	1168.1	0.194	2.705 Exceeded	150	0.12	0.12	0.665	-0.470 Decreased	
M35/4744	ARMSTRONG M.A. & G.G.	0	15	12	10	-1.801	8.199	6.559	1.640	0.718 ok	1174.9	0.193	0.911 ok	150	0.12	0.12	0.640	-0.447 Decreased	
M35/4879	MCQUILLAN R.	13.7	15	12	10	-1.190	8.810	7.048	1.762	0.562 ok	1175.2	0.193	0.755 ok	150	0.12	0.12	0.569	-0.376 Decreased	
M35/4774	BURROWS T.F.	11.2	15	12	10	-1.870	8.130	6.504	1.626	0.119 ok	1184.3	0.192	0.310 ok	150	0.12	0.12	0.543	-0.351 Decreased	
M35/4717	IRELAND W.P. & F.W.	9.1	15	12	10	-1.320	8.680	6.944	1.736	1.167 ok	1187.8	0.191	1.358 ok	150	0.12	0.12	0.708	-0.517 Decreased	
M35/6797	WITHERS D	20	20	17	15	-1.950	13.050	10.440	2.610	0.142 ok	1189.1	0.191	0.333 ok	150	0.12	0.12	0.557	-0.366 Decreased	
BW24/0539	Brian and Agnes McLintock	18	18	16	14	-1.996	12.004	9.603	2.401	0.000 ok	1190.0	0.191	0.191 ok	150	0.12	0.12	0.474	-0.283 Decreased	
M35/8399	LYNN RJ	10.5	15	12	10	-1.240	8.760	7.008	1.752	0.771 ok	1225.9	0.185	0.956 ok	150	0.12	0.12	0.627	-0.442 Decreased	
M35/7701	HJ SMITH	86	86	84	82	-0.980	81.020	64.816	16.204	0.934 ok	1227.3	0.624	1.558 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/5736	Canterbury Pet Foods Limited	15.5	15.5	12.5	10.5	-2.350	8.150	6.520	1.630	1.652 Exceeded	1239.6	0.183	1.835 Exceeded	150	4.29	3.33	0.719	-0.536 Decreased	
M35/7171	Glenalbany Deer Park Limited	13	15	12	10	-2.350	7.650	6.120	1.530	1.652 Exceeded	1239.6	0.183	1.835 Exceeded	150	0	0	0.719	-0.536 Decreased	
M35/8381	Marilyn Brown	88	88	86.5	84.5	-1.040	83.460	66.768	16.692	1.196 ok	1253.5	0.599	1.795 ok	150	0.12	0.12	#N/A	#N/A	#N/A
M35/4741	SCOTT J.H.	9.1	15	12	10	-2.790	7.210	5.768	1.442	2.403 Exceeded	1284.7	0.176	2.579 Exceeded	150	0.12	0.12	0.640	-0.465 Decreased	
M35/4720	MOORE E.H.	5.4	15	12	10	-1.350	8.650	6.920	1.730	1.171 ok	1286.7	0.176	1.347 ok	150	0.12	0.12	0.628	-0.453 Decreased	
M35/6851	Mr S T Hampton	18	18	15	13	-1.930	11.070	8.856	2.214	0.438 ok	1293.5	0.174	0.613 ok	150	1.83	1.28	0.531	-0.356 Decreased	
M35/9639	MR & MRS D J & K A MCKENZIE	17.5	17.5	15	13	-1.380	11.620	9.296	2.324	0.000 ok	1298.6	0.174	0.174 ok	150	0.12	0.12	0.419	-0.245 Decreased	
M35/9071	Watson A A	12	15	12	10	-0.900	9.100	7.280	1.820	0.797 ok	1309.1	0.172	0.969 ok	150	0	0	0.547	-0.374 Decreased	
M35/9257	Mr M D & Mrs N E Wilkinson	18	18	16.5	14.5	-1.360	13.140	10.512	2.628	0.000 ok	1309.1	0.172	0.172 ok	150	0.12	0.12	0.428	-0.256 Decreased	
M35/6061	CAMERON N & A	20.8	20.8	17.8	15.8	-4.140	11.660	9.328	2.332	0.268 ok	1311.4	0.172	0.440 ok	150	0.12	0.12	0.490	-0.319 Decreased	
M35/4683	HARRIS I.R.	9.3	15	12	10	-2.860	7.140	5.712	1.428	0.889 ok	1320.2	0.170	1.060 ok	150	0.12	0.12	0.570		

M35/3042	EYRE C.C.	6.1	15	12	10	-1.130	8.870	7.096	1.774	0.486 ok	1372.3	0.163	0.649 ok	150	0	0	0.448	-0.285	Decreased
M35/4725	ROBSON W.J.	19.8	19.8	16.8	14.8	-1.960	12.840	10.272	2.568	0.135 ok	1383.7	0.161	0.297 ok	150	0.12	0.12	0.433	-0.272	Decreased
M35/10480	Mr & Mrs DW & TL Lindsay	23.73	23.73	21.73	19.73	-4.230	15.500	12.400	3.100	0.705 ok	1412.7	0.157	0.862 ok	150	0.12	0.12	0.494	-0.337	Decreased
M35/9632	MR & MRS D J & K A MCKENZIE	17.37	17.37	15.37	13.37	-1.490	11.880	9.504	2.376	0.000 ok	1413.0	0.157	0.157 ok	150	0.12	0.12	0.365	-0.208	Decreased
M35/9640	MR & MRS D J & K A MCKENZIE	16.47	16.47	14.47	12.47	-1.330	11.140	8.912	2.228	0.000 ok	1415.2	0.157	0.157 ok	150	0.12	0.12	0.368	-0.212	Decreased
M35/9258	Mr M D & Mrs N E Wilkinson	18	18	16.5	14.5	-1.340	13.160	10.528	2.632	0.000 ok	1417.8	0.156	0.156 ok	150	0.12	0.12	0.372	-0.216	Decreased
M35/9633	MR & MRS D J & K A MCKENZIE	17.55	17.55	15.55	13.55	-1.460	12.090	9.672	2.418	0.000 ok	1435.8	0.154	0.154 ok	150	0.12	0.12	0.355	-0.201	Decreased
M35/11074	MACRAE LAND COMPANY	17	17	15.5	13.5	-0.830	12.670	10.136	2.534	0.650 ok	1442.3	0.153	0.803 ok	150	0.12	0.12	0.435	-0.282	Decreased
BW24/0575	Greg Holland	18	18	16	14	-1.872	12.128	9.703	2.426	0.000 ok	1457.5	0.151	0.151 ok	150	0.12	0.12	0.349	-0.198	Decreased
M35/9558	MR & MRS A F & C J ROSLING	24	24	22.5	20.5	-3.840	16.660	13.328	3.332	0.483 ok	1465.0	0.150	0.633 ok	150	0	0	0.441	-0.291	Decreased
BW24/0552	Benn & Amy Mathieson	20	20	18	16	-2.044	13.956	11.164	2.791	1.034 ok	1467.6	0.149	1.183 ok	150	0.12	0.12	0.485	-0.335	Decreased
BW24/0529	Jarrad Allen	18	18	16	14	-2.074	11.926	9.541	2.385	1.033 ok	1468.1	0.149	1.182 ok	150	0.12	0.12	0.490	-0.341	Decreased
M35/8975	P A & P L Trumic	22	22	20.5	18.5	-3.910	14.590	11.672	2.918	0.626 ok	1472.5	0.149	0.775 ok	150	0.12	0.12	0.445	-0.296	Decreased
BW24/0545	K Vaughan	18	18	16	14	-2.069	11.931	9.545	2.386	1.033 ok	1473.1	0.149	1.181 ok	150	0.12	0.12	0.487	-0.339	Decreased
M35/9636	RJ & AR North	17.82	17.82	15.82	13.82	-1.260	12.560	10.048	2.512	0.000 ok	1474.6	0.149	0.149 ok	150	0.12	0.12	0.350	-0.202	Decreased
M35/6867	HARRIS I. R.	20	20	17	15	-2.520	12.480	9.984	2.496	1.715 ok	1483.1	0.147	1.862 ok	150	0.12	0.12	0.519	-0.372	Decreased
BW24/0624	Sam Jury	18	18	16	14	-2.027	11.973	9.578	2.395	1.035 ok	1486.4	0.147	1.182 ok	150	0.12	0.12	0.471	-0.324	Decreased
M35/4768	Southern Chicks Limited	14.3	15	12	10	-2.570	7.430	5.944	1.486	1.860 Exceeded	1493.9	0.146	2.006 Exceeded	150	0.29	0.29	0.524	-0.378	Decreased
M35/6830	Mr R J Fife and D J Jamieson	13.9	15	12	10	-1.750	8.250	6.600	1.650	0.000 ok	1499.5	0.145	0.145 ok	150	0.12	0.12	0.347	-0.202	Decreased
M35/6547	CLARK DG & EM	15	15	12	10	-1.870	8.130	6.504	1.626	0.000 ok	1522.6	0.142	0.142 ok	150	0.12	0.12	0.349	-0.207	Decreased
M35/9740	MR & MRS K & L CAMPAGNOLO	17.8	17.8	15.29	13.29	-2.100	11.190	8.952	2.238	0.297 ok	1538.8	0.140	0.437 ok	150	0.12	0.12	0.380	-0.240	Decreased
M35/9602	MR & MRS J D & K A MCKENZIE	17.4	17.4	15.4	13.4	-1.170	12.230	9.784	2.446	0.000 ok	1543.7	0.139	0.139 ok	150	0.12	0.12	0.335	-0.195	Decreased
M35/9218	Sparrow K & H	24	24	22.5	20.5	-3.920	16.580	13.264	3.316	0.685 ok	1549.4	0.139	0.824 ok	150	0	0	0.414	-0.276	Decreased
M35/9641	MR & MRS D J & K A MCKENZIE	16.05	16.05	14.05	12.05	-1.310	10.740	8.592	2.148	0.000 ok	1557.2	0.138	0.138 ok	150	0.12	0.12	0.311	-0.174	Decreased
M35/11075	MACRAE LAND COMPANY	20	20	17	15	-1.070	13.930	11.144	2.786	0.432 ok	1593.3	0.133	0.565 ok	150	0.12	0.12	0.344	-0.211	Decreased
M35/4184	COMBRIDGE K.	11	15	12	10	-1.930	8.070	6.456	1.614	0.108 ok	1603.4	0.132	0.240 ok	150	0.12	0.12	0.320	-0.188	Decreased
M35/3019	MacRae Land Company Limited	15.4	15.4	12.4	10.4	-1.060	9.340	7.472	1.868	0.325 ok	1611.3	0.131	0.456 ok	150	0	0	0.333	-0.202	Decreased
BW24/0565	Simon Collin	18	18	16	14	-2.101	11.899	9.519	2.380	1.031 ok	1622.1	0.130	1.160 ok	150	0.12	0.12	0.404	-0.274	Decreased
M35/0308	Mr E A Anderson	9.5	15	12	10	-3.190	6.810	5.448	1.362	2.375 Exceeded	1628.3	0.129	2.504 Exceeded	150	4.71	2.75	0.419	-0.290	Decreased
M35/11063	MR & MRS EJ & JR GRAHAM	25	25	22	20	-4.400	15.600	12.480	3.120	2.026 ok	1630.3	0.129	2.154 ok	150	0.12	0.12	0.443	-0.314	Decreased
M35/9635	MR & MRS D J & K A MCKENZIE	17.86	17.86	15.36	13.36	-1.250	12.110	9.688	2.422	0.000 ok	1634.0	0.128	0.128 ok	150	0.12	0.12	0.288	-0.160	Decreased
BW24/0544	Michael Meade	17.3	17.3	15.3	13.3	-2.094	11.206	8.964	2.241	1.046 ok	1636.6	0.128	1.174 ok	150	0.12	0.12	0.395	-0.267	Decreased
M35/9642	MR & MRS D J & K A MCKENZIE	17.25	17.25	15.25	13.25	-1.300	11.950	9.560	2.390	0.000 ok	1637.2	0.128	0.128 ok	150	0.12	0.12	0.283	-0.155	Decreased
M35/4728	ADAMS R.D.	27.4	27.4	24.4	22.4	-4.130	18.270	14.616	3.654	0.291 ok	1644.4	0.127	0.418 ok	150	0.12	0.12	0.334	-0.207	Decreased
M35/4729	ADAMS R.D.	27.4	27.4	24.4	22.4	-4.130	18.270	14.616	3.654	0.291 ok	1644.4	0.127	0.418 ok	150	0	0	0.334	-0.207	Decreased
M35/7619	Ohoka Utilities Limited	26.77	26.77	23.77	21.77	-4.320	17.450	13.960	3.490	1.503 ok	1644.7	0.127	1.630 ok	150	12.5	9.43	0.416	-0.289	Decreased
M35/7288	POLSON AH DR	12	15	12	10	-1.840	8.160	6.528	1.632	0.000 ok	1652.0	0.126	0.126 ok	150	0.12	0.12	0.293	-0.167	Decreased
BW24/0768	Craig Pethig	22.56	22.56	17.4	15.4	-1.963	13.437	10.749	2.687	0.707 ok	1654.1	0.126	0.833 ok	150	0.12	0.12	0.352	-0.227	Decreased
M35/4726	MARSHALL J.J.	5.7	15	12	10	-1.090	8.910	7.128	1.782	0.116 ok	1654.1	0.126	0.242 ok	150	0.12	0.12	0.304	-0.179	Decreased
M35/2699	Mr & Mrs J D & K A McKenzie	13.3	15	12	10	-1.370	8.630	6.904	1.726	0.000 ok	1665.9	0.124	0.124 ok	150	0.12	0.12	0.270	-0.145	Decreased
M35/11077	MACRAE LAND COMPANY	18	18	16.5	14.5	-0.740	13.760	11.008	2.752	0.330 ok	1672.5	0.124	0.454 ok	150	0.12	0.12	0.308	-0.184	Decreased
BW24/0640		23	23	15	13	-2.082	10.918	8.734	2.184	1.102 ok	1673.1	0.124	1.226 ok	150	0.12	0.12	0.373	-0.250	Decreased
M35/4742	SCOTT J.H.	9.1	15	12	10	-3.330	6.670	5.336	1.334	2.263 Exceeded	1696.1	0.121	2.384 Exceeded	150	0.12	0.12	0.391	-0.270	Decreased
M35/0314	BAGRIE WL	15.8	15.8	11	9	-1.320	7.680	6.144	1.536	1.411 ok	1696.3	0.121	1.532 ok	150	0.12	0.12	0.356	-0.235	Decreased
M35/4099	CAMERON J.G. & J.L.	11.5	15	12	10	-2.980	7.020	5.616	1.404	2.538 Exceeded	1702.4	0.120	2.658 Exceeded	150	0.12	0.12	0.375	-0.255	Decreased
M35/8160	Ohoka Utilities Limited	28.7	28.7	25.8	23.8	-4.030	19.770	15.816	3.954	1.242 ok	1703.2	0.120	1.362 ok	150	15	15	0.386	-0.266	Decreased
M35/5608	Pheloung Investments Limited	15	15	13.5	11.5	-2.110	9.390	7.512	1.878	0.136 ok	1711.1	0.119	0.255 ok	150	0.12	0.12	0.290	-0.171	Decreased
M35/4681	SANDERS E.W. & T.J.	12.8	15	12	10	-2.750	7.250	5.800	1.450	2.132 Exceeded	1713.5	0.119	2.251 Exceeded	150	0.12	0.12	0.397	-0.278	Decreased
M35/4778	P D & A G Bagrie	10.7	15	12	10	-1.150	8.850	7.080	1.770	0.680 ok	1713.6	0.119	0.799 ok	150	20	10	0.350	-0.231	Decreased
M35/6973	Mr J R Dunlop	19.7	19.7	17.14	15.14	-1.960	13.180	10.544	2.636	0.108 ok	1731.9	0.117	0.225 ok	150	2.31	2.12	0.274	-0.157	Decreased
M35/6794	BROWN K.T.	15	15	12	10	-2.090	7.910	6.328	1.582	0.150 ok	1738.1	0.116	0.266 ok	150	0.12	0.12	0.285	-0.169	Decreased
M35/11286	Macrae Land Company	15.3	15.3	14.3	12.3	-0.740	11.560	9.248	2.312	0.481 ok	1741.8	0.116	0.597 ok	150	0.12	0.12	0.295	-0.180	Decreased
M35/8414	SANDERS SW & LR	17.8	17.8	16.4	14.4	-2.760	11.640	9.312	2.328	1.918 ok	1747.7	0.115	2.033 ok	150	0.12	0.12	0.378	-0.263	Decreased
M35/9603	MR & MRS J D & K A MCKENZIE	17.7	17.7	15.7	13.7	-1.140	12.560	10.048	2.512	0.107 ok	1763.7	0.113	0.220 ok	150	0.12	0.12	0.254	-0.141	Decreased
M35/11227	KAVANAGH FAMILY TRUST	18	18	17	15	-2.590	12.410	9.928	2.482	2.137 ok	1766.8	0.113	2.250 ok	150	0.12	0.12	0.374	-0.261	Decreased
M35/9643	Mr BW Magee & Mrs R McCourt	17.5	17.5	15.5	13.5	-1.300	12.200	9.760	2.440	0.000 ok	1790.9	0.110	0.110 ok	150	0.12	0.12	0.233	-0.123	Decreased
M35/4751	FREE D.R. & I.C.	5	15	12	10	-1.550	8.450	6.760	1.690	0.170 ok	1794.7	0.110	0.280 ok	150	0.12	0.12	0.231	-0.121	Decreased
M35/9634	MR & MRS D J & K A MCKENZIE	17.35	17.35	14.85	12.85	-1.420	11.430	9.144	2.286	0.125 ok	1799.9	0.110	0.235 ok	150	0.12	0.12	0.228	-0.118	Decreased
BW24/0120	MR DEAN STEPHEN MCCONNELL	23.5	23.5	21.5	19.5	-1.785	17.715	14.172	3.543	0.000 ok	1803.7	0.109	0.109 ok	150	0.12	0.12	0.236	-0.127	Decreased
BW24/0121	MR DEAN STEPHEN MCCONNELL	29.9	29.9	21.5	19.5	-1.785	17.715	14.172	3.543	0.000 ok	1803.7	0.109	0.109 ok	150	0.12	0.12	0.236	-0.127	Decreased
M35/11073	Jenkins M	20.3	20.3	18.8	16.8	-3.690	13.110	10.488	2.622	0.520 ok	1812.2	0.108	0.628 ok	150	0.12	0.12	0.278	-0.170	Decreased
BW23/0218	Sarah Craig Trust	24	24	21	19	-3.612	15.388	12.310	3.078	0.669 ok	1820.1	0.107	0.777 ok	150	0.12	0.12	0.		

M35/9222	Mr A & Mrs F A MacKenzie	24	24	22.5	20.5	-3.880	16.620	13.296	3.324	0.368 ok	1820.6	0.107	0.476 ok	150	0.12	0.12	0.283	-0.176 Decreased
BW24/0334	Russell Pegler	24	24	23	21	-1.694	19.306	15.445	3.861	0.000 ok	1832.4	0.106	0.106 ok	150	0.12	0.12	0.220	-0.114 Decreased
M35/4771	CROZIER N.J.	6.7	15	12	10	-1.060	8.940	7.152	1.788	0.141 ok	1855.9	0.104	0.244 ok	150	0.12	0.12	0.234	-0.130 Decreased
BW24/0560	Graham Brown	11.7	15	12	10	-1.683	8.317	6.654	1.663	0.000 ok	1863.2	0.103	0.103 ok	150	0.12	0.12	0.218	-0.115 Decreased
BW24/0321	Waimakariri District Council	2.5	15	12	10	-4.110	5.890	4.712	1.178	0.193 ok	1870.2	0.102	0.295 ok	150	0.12	0.12	0.254	-0.152 Decreased
M35/8410	MR B M DAVEY	23.9	23.9	21.9	19.9	-3.750	16.150	12.920	3.230	0.133 ok	1872.1	0.102	0.235 ok	150	0.12	0.12	0.237	-0.135 Decreased
M35/11106	MR & MRS RJ & LK THOMAS	17	17	16	14	-2.890	11.110	8.888	2.222	2.484 Exceeded	1875.8	0.102	2.586 Exceeded	150	0.12	0.12	0.325	-0.223 Decreased
M35/0352	Mr & Mrs I L & J H Ward	4.79	15	12	10	-1.830	8.170	6.536	1.634	1.055 ok	1898.3	0.000	1.055 ok	0	0	0	0.290	-0.290 Decreased
BW24/0583	Peter Bagrie	77.65	77.65	74.65	72.65	-2.078	70.572	56.457	14.114	1.540 ok	1909.4	0.233	1.773 ok	150	0.12	0.12	#N/A	#N/A #N/A
M35/0351	Keilyn Farms Limited	11.4	15	12	10	-3.250	6.750	5.400	1.350	1.784 Exceeded	1909.8	0.000	1.784 Exceeded	0	29.95	23.57	0.282	-0.282 Decreased
M35/4614	TOZER N.A.	0	15	12	10	-2.806	7.194	5.755	1.439	2.137 Exceeded	1914.7	0.000	2.137 Exceeded	0	0.12	0.12	0.274	-0.274 Decreased
M35/4678	MCINTYRE J.L.	20.1	20.1	17.1	15.1	-4.340	10.760	8.608	2.152	1.442 ok	1915.5	0.000	1.442 ok	0	0.12	0.12	0.297	-0.297 Decreased
M35/4669	WARD L.G.	11	15	12	10	-1.500	8.500	6.800	1.700	1.070 ok	1916.3	0.000	1.070 ok	0	0.12	0.12	0.282	-0.282 Decreased
M35/5332	Ohoka Downs Society Inc	35.2	35.2	32.5	30.5	-4.200	26.300	21.040	5.260	0.000 ok	1917.0	0.230	0.230 ok	150	17.44	17.35	#N/A	#N/A #N/A
M35/11072	MACRAE LAND COMPANY	18	18	16.5	14.5	-0.700	13.800	11.040	2.760	0.549 ok	1922.1	0.000	0.549 ok	0	0.12	0.12	0.245	-0.245 Decreased
M35/0616	A D & E H CORNISH	12.8	15	12	10	-1.440	8.560	6.848	1.712	0.150 ok	1925.0	0.000	0.150 ok	0	0	0	0.195	-0.195 Decreased
M35/3309	J G & S Wright	12	15	12	10	-1.320	8.680	6.944	1.736	0.000 ok	1929.1	0.000	0.000 ok	0	4.9	4.9	0.194	-0.194 Decreased
M35/18231	MR & MRS MWH & JL TYREE	18	18	17	15	-1.540	13.460	10.768	2.692	2.500 ok	1931.7	0.000	2.500 ok	0	0.12	0.12	0.304	-0.304 Decreased
M35/10634	MR & MRS C D & C L HEAPHY	18	18	17	15	-3.470	11.530	9.224	2.306	2.740 Exceeded	1933.7	0.000	2.740 Exceeded	0	0.12	0.12	0.300	-0.300 Decreased
M35/10982	MR & MRS IL & JH WARD	18	18	16.5	14.5	-1.390	13.110	10.488	2.622	2.067 ok	1935.5	0.000	2.067 ok	0	0.12	0.12	0.266	-0.266 Decreased
M35/4668	Mr & Mrs I L & J H Ward	8.62	15	12	10	-1.510	8.490	6.792	1.698	1.102 ok	1939.1	0.000	1.102 ok	0	0	0	0.273	-0.273 Decreased
BW24/0427	Ohoka School	17.35	17.35	15.85	13.85	-1.674	12.176	9.741	2.435	0.116 ok	1943.1	0.000	0.116 ok	0	0.12	0.12	0.203	-0.203 Decreased
M35/5972	Mr & Mrs J D & K A McKenzie	13.9	15	12	10	-1.160	8.840	7.072	1.768	0.000 ok	1944.0	0.000	0.000 ok	0	0.12	0.12	0.199	-0.199 Decreased
M35/2918	A D & E H CORNISH	8.5	15	12	10	-1.410	8.590	6.872	1.718	0.129 ok	1944.1	0.000	0.129 ok	0	0.12	0.12	0.190	-0.190 Decreased
M35/9126	Van't Veen G B & J G	30.5	30.5	19	17	-3.900	13.100	10.480	2.620	0.388 ok	1944.6	0.000	0.388 ok	0	1.47	1.47	0.248	-0.248 Decreased
M35/7205	TONKIN G.D. & S.A.	12	15	12	10	-1.240	8.760	7.008	1.752	0.112 ok	1952.8	0.000	0.112 ok	0	0.12	0.12	0.192	-0.192 Decreased
M35/17683	MR & MRS I L & J H WARD	77	77	71.1	69.1	-1.170	67.930	54.344	13.586	0.495 ok	1958.3	0.218	0.713 ok	150	0.12	0.12	#N/A	#N/A #N/A
M35/0609	SCHOOL	6.7	15	12	10	-1.060	8.940	7.152	1.788	0.141 ok	1962.6	0.000	0.141 ok	0	0	0	0.202	-0.202 Decreased
M35/4731	FREWER K.P.	12.2	15	12	10	-1.690	8.310	6.648	1.662	0.000 ok	1966.1	0.000	0.000 ok	0	0.12	0.12	0.189	-0.189 Decreased
M35/4748	REID R.C.	9.1	15	12	10	-3.640	6.360	5.088	1.272	2.513 Exceeded	1973.0	0.000	2.513 Exceeded	0	0.12	0.12	0.275	-0.275 Decreased
M35/8409	ARCHIBALD TR	23.2	23.2	22.2	20.2	-3.430	16.770	13.416	3.354	0.234 ok	1973.7	0.000	0.234 ok	0	0.12	0.12	0.207	-0.207 Decreased
M35/11067	MACRAE LAND COMPANY	20	20	18.5	16.5	-0.690	15.810	12.648	3.162	0.295 ok	1973.7	0.000	0.295 ok	0	0.12	0.12	0.207	-0.207 Decreased
M35/7113	CLEMENTS K.S.	17.7	17.7	15	13	-2.000	11.000	8.800	2.200	0.121 ok	1974.2	0.000	0.121 ok	0	0.12	0.12	0.200	-0.200 Decreased
M35/2624	JOHNSON LHM	16.56	16.56	13.56	11.56	-1.290	10.270	8.216	2.054	0.117 ok	1977.2	0.000	0.117 ok	0	0	0	0.184	-0.184 Decreased
M35/7575	VERBERN F.W	18	18	16.5	14.5	-1.480	13.020	10.416	2.604	0.000 ok	1980.6	0.000	0.000 ok	0	0.12	0.12	0.193	-0.193 Decreased
BW23/0643	Kevin Hart	11	15	12	10	-2.882	7.118	5.694	1.424	2.001 Exceeded	1988.9	0.000	2.001 Exceeded	0	0.12	0.12	0.250	-0.250 Decreased
M35/10524	Mr & Ms BR & DV Hickling & Sinclair	25.9	25.9	23.9	21.9	-4.250	17.650	14.120	3.530	0.764 ok	1988.9	0.000	0.764 ok	0	0.12	0.12	0.246	-0.246 Decreased
M35/10129	Ohoka Park Truffiere limited	17.62	17.62	15.62	13.62	-2.230	11.390	9.112	2.278	0.173 ok	1995.6	0.000	0.173 ok	0	0.12	0.12	0.213	-0.213 Decreased
M35/0696	MULLIGAN P.R.R.	6.1	15	12	10	-2.040	7.960	6.368	1.592	0.239 ok	1998.3	0.000	0.239 ok	0	0.12	0.12	0.196	-0.196 Decreased
BW23/0572	Kevin Hart	10.62	15	12	10	-2.902	7.098	5.679	1.420	2.188 Exceeded	2000.0	0.000	2.188 Exceeded	0	0.12	0.12	0.248	-0.248 Decreased