Unilever Site Groundwater Take: Technical Report to Support Consent Renewal

Prepared for

Primeproperty Group Ltd

July 2015

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Quality Control Sheet

TITLE	Unilever Site Groundwater Take: Technical Report to Support Consent Renewal
CLIENT	Primeproperty Group Ltd
VERSION	Final
ISSUE DATE	July 2015
JOB REFERENCE	W0262500R001
SOURCE FILE(S)	W0262500R001 Final.docx W02062500_Figures.pdf

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Executive Summary

Pattle Delamore Partners (PDP) has been engaged by Primeproperty Group (the Applicant) to prepare a technical assessment report to support an application to renew a groundwater take consent at the current Unilever site in Petone. The existing consent is to take up to 2,543 m^3/day and 9.26 x 10^5 m^3/year from the Waiwhetu aquifer, at a maximum rate of 29.4 L/s. This consent is due to expire on 29 March 2017.

The Applicant is seeking to renew the groundwater take consent with the same daily and annual take volumes provided by the existing consent. The Applicant plans to let the site for industrial use, which will require the continued abstraction of groundwater at the current consented rate. The abstraction bores are installed within the Waiwhetu aquifer, which forms part of the Lower Hutt groundwater zone.

PDP have assessed the current groundwater takes in the Lower Hutt groundwater management zone (GMZ) together with total consented abstraction volumes and actual abstracted volumes. The Regional Council is proposing to increase groundwater allocation in the Lower Hutt GMZ. Whilst the resource is currently over allocated by 8.5 x 10^5 m^3/year, the revised allocation is greater than that currently consented. Prior to the new Natural Resources regional plan coming into force, GWRC indicate that they will assess each new consent and renewal on a case-by-case basis.

PDP has carried out an assessment of the proposed abstraction, including the potential effects on saline intrusion. Recently, a revised saline intrusion monitoring framework was proposed by GWRC. The Council is concerned about the local effects that the proposed take would have on monitoring wells within the framework and the potential activation of trigger levels. Activating trigger levels could cause GWRC to decrease bulk water supply abstraction. This could be problematic, especially during times of drought.

Historically, fluctuations in water level in the monitoring wells have been controlled by GWRC bulk water supply abstraction, which masks any effect of abstraction by Unilever. It is expected that this will continue, and drawdown in the closest saline intrusion monitoring well, R27/0122, as a result of the proposed take is not expected to exceed 0.09 m.

Despite the predicted small drawdown effects, abstraction at this rate from the Unilever site could cause the existing stand-by level of 2.5 m amsl to be breached more regularly, although no significant increase in risk of saline intrusion would actually occur. It is suggested that GWRC consider decreasing the stand-by level to 2.45 m amsl in monitoring well R27/0122. This would prevent the local effect from this take from influencing groundwater abstraction elsewhere in the Lower

Hutt GMZ, and would not increase the risk of saline intrusion in the Waiwhetu aquifer.

Hydraulic gradients between well pairs are also used as trigger levels within the proposed saline intrusion management framework. Analysis by PDP shows that small, isolated reversals in these gradients occur in response to abrupt increases in abstraction from GWRC's Waterloo wellfield. Two of the last three reversals have been caused by an increase in abstraction from the Waterloo wellfield above GWRC's consented volume. It is proposed that a 7-day mean hydraulic gradient is used between monitoring wells R27/0122 and R27/1171 in the monitoring framework. This will prevent small, isolated reversals caused by abstraction from the Waterloo wellfield from disrupting groundwater users in the Lower Hutt groundwater management zone.

To be consistent with the proposed saline intrusion management framework, PDP suggest that a series of conditions are applied to the proposed abstraction. These conditions would involve progressive reduction in pumping from the Applicant's bores as the level of risk increases. Given current conditions, these measures will be sufficient to protect against the risk of saline intrusion.

Effects on neighbouring groundwater bores and stream depletion will be minimal, owing to the relatively high transmissivity of the Waiwhetu aquifer.

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1.0 Introduction

1.1 Background

Pattle Delamore Partners (PDP) has been engaged by Primeproperty Group (the Applicant) to prepare a technical report in support of an application to renew a groundwater take consent at the current Unilever site in Petone. The existing consent (consent number WGN070193) is to take up to 2,543 m^3/day and 9.26 x 10^5 m^3/year from the Waiwhetu aquifer, at a maximum rate of 29.4 L/s. This consent is due to expire on 29 March 2017. The Applicant is seeking to renew the groundwater take consent with the same daily and annual take volumes provided by the existing consent, as it plans to lease the site for industrial use. This will require the continued abstraction of groundwater at the currently consented rate.

At present, Unilever abstract groundwater from two bores located immediately adjacent to each other, with a third used as a back-up. Groundwater abstracted at the site is utilised for industrial purposes. Previously, Unilever held a consent to abstract up to 4,550 m^3/day (52.7 L/s). From 1971 – 1978, daily groundwater takes regularly exceeded 3,000 m^3. Since then, groundwater usage by Unilever has decreased as factory production has slowed.

Figure 1 shows the location of the Unilever site in Petone.

1.2 Report Outline

This report includes the following:

- A description of the hydrogeology of the Lower Hutt groundwater zone;
- A description of the data obtained to support the technical assessment;
- An assessment of current consented groundwater takes in the Lower Hutt groundwater zone, total consented abstraction volumes and actual abstracted volumes; and
- A technical assessment, focusing on what we understand to be the main concerns of Greater Wellington Regional Council (GWRC).

2.0 Lower Hutt Aquifer System

2.1 Hydrogeology

The Unilever site is located within the Lower Hutt Groundwater Management Zone (GMZ), and the two main abstraction bores at the Unilever site take water from the Upper Waiwhetu aquifer. Figure 1 shows the location of the Unilever site, and neighbouring consented groundwater takes.

Along the Petone foreshore, borehole logs indicate that the aquifer is encountered at a depth of 20-30 m below ground level, and is around 20-55 m thick. It is comprised of well-sorted, rounded gravels deposited in a high energy riverine environment. The aquifer extends from Taita Gorge in the north and underlies much of Wellington harbour.

Underlying the Upper Waiwhetu aquifer is the Lower Waiwhetu aquifer, which has a greater abundance of finer sediment within the gravel matrix, and consequently a lower permeability. Figure 2 shows a conceptual model of the hydrogeological system.

South of the Kennedy-Good Bridge (crossing the Hutt River at Avalon Park), the aquifer is overlain by the Melling Peat and, further down-valley, the Petone Marine Beds, which are composed of low permeability silts, sands, and peat. At Petone foreshore, the confining layer is up to 30 m thick. This confinement causes static water levels in the Waiwhetu aquifer proximal to the Unilever site to be artesian at around 3–4 m above ground level.

Overlying the confining layer is the Taita Alluvium, which is a heterogeneous unit comprised of riverine and flood plain deposits of variable permeability. Dependent upon location, this unit can be a productive aquifer.

Underlying the Lower Waiwhetu aquifer is the Moera Gravel aquifer. The Moera Gravels are further confined by the lower permeability Wilford shell bed layer, which lies between the two aquifers (WRC, 1995). The shell bed layer is up to 30 m thick, and is at 70-83 m depth in the Petone foreshore area.

2.2 Recharge and Groundwater Flow

Recharge to the Waiwhetu aquifer occurs primarily from the Hutt River (Gyopari, 2014). North of Kennedy-Good Bridge the Waiwhetu aquifer is unconfined and the river loses water to the aquifer between the Kennedy-Good Bridge and Taita Gorge. South of the bridge, the Waiwhetu aquifer becomes confined by the Melling Peat, and further down the valley by the Petone Marine Beds, and the Hutt River gains from the Taita Alluvium. Figure 1 shows the approximate location of the boundary between the unconfined and confined aquifer.

Groundwater flows in a south-west direction down the Hutt Valley towards Wellington Harbour. Downgradient of the Waterloo well field, which is consented to supply up to 83,115 m^3/day of bulk water supply to the Wellington region, the hydraulic gradient flattens significantly due to the drawdown associated with this large take (see below).

Due to the high artesian heads, groundwater flow within the Waiwhetu aquifer also has a vertical component. Groundwater discharges through the overlying Petone Marine Beds aquitard both onshore and offshore to the overlying Taita alluvium, and to the sea. There are a number of submarine springs through which the aquifer discharges off the coast through weaknesses in the Petone Marine Beds.

The Lower Waiwhetu aquifer has similar groundwater heads to the overlying Upper Waiwhetu aquifer. However, groundwater heads in the Moera Gravel aquifer are approximately 1 m greater than heads in the overlying Waiwhetu aquifer, meaning vertical leakage through the Wilford shell bed layer can occur.

2.3 Hydraulic Properties

Hydraulic properties of the Waiwhetu aquifer have been characterised through three large scale pumping tests involving pumping from the GWRC wellfields at Gear Island (1991) and Waterloo (1993 and 1995). Pumping test analyses from these tests indicate that the Upper Waiwhetu aquifer is highly transmissive. Geometric means of the derived transmissivities mostly lie in the range 22,000 – 38,900 m^2/day, with a storage coefficient of $3 \times 10^{-4} - 1 \times 10^{-3}$ (Gyopari, 2014). Analysis of these pumping tests indicates that some leakage occurs between the Moera Gravels, and Waiwhetu aquifer across the Wilford Shell bed. A hydraulic conductivity was calculated for the Wilford Shell bed aquitard of around 2.4×10^{-2} m/day (WRC, 1995).

Maps of the transmissivity distribution, derived from the pumping test analyses, suggest that around the Petone foreshore area, the transmissivity is in the range of 40,000–50,000 m^2/day (WRC, 1995). Aquifer transmissivity decreases further inland, as aquifer thickness decreases.

In order to be conservative, PDP have used the values of 28,000 m^2/day, and 6.4×10^{-4} for drawdown assessments presented later in this report. These values have been derived from the calibrated hydraulic parameters used in the most recent Hutt Aquifer Model (HAM3) numerical model developed for GWRC by Gyopari (2014). Calibrated values for the Upper Waiwhetu aquifer were 1400 m/day and 3.2×10^{-5} m^{-1} for hydraulic conductivity and specific storage, respectively. Using the most conservative (smallest) thickness of the Upper Waiwhetu aquifer of 20 m results gives values of 28,000 m^2/day, and 6.4×10^{-4} for the transmissivity and storativity respectively.

3.0 Data Obtained

In order to carry out this assessment, PDP obtained data from GWRC and Unilever. This is outlined below:

GWRC data:

- Groundwater level time series for GWRC monitoring wells across the Lower Hutt GMZ;
- Abstraction data for groundwater take consents within the Lower Hutt groundwater zone; and

- Copies of relevant hydrogeological reports; this involved a file viewing.

Unilever data:

- A site plan showing the location of abstraction bores;
- Groundwater quality data;
- Groundwater abstraction data; and
- Information about the history and usage of abstracted groundwater.

4.0 Existing Groundwater Take Consents

Currently, there are 18 groundwater take consents within the Lower Hutt GMZ. Three of these abstract groundwater from the Taita Alluvium, whilst the remaining 15 take groundwater from the Waiwhetu aquifer. Table 1 details the consented takes, and the approximate actual usage between June 2012 and July 2014 (2 year period).

Table 1: Consented Groundwater takes in the Lower Hutt GMZ, consented abstraction rates and actual use.

Consent Holder	Aquifer	Consented Take (m^3/day)	Consented Take (m^3/year)	Actual Usage[1]
GWRC	Waiwhetu	83,115	30,253,860	63-72 %
Unilever	Waiwhetu	2,543	925,600	2 %
Avalon Studios	Taita Alluvium	2,419	880,589	No Data
Hutt Valley Health	Waiwhetu	2,160	786,240	No Data
Hutt City Council	Taita Alluvium	1,530	17,075	14-18 %
Hutt City Council	Waiwhetu	1,102	15,000	64-76 %
Boulcott Golf Club	Waiwhetu	995	199,000	No Data
Shandon Golf Club	Waiwhetu	560	63,000	37-54 %
Canterbury Spinners Ltd	Waiwhetu	543	197,601	3-8 %

Table 1: Consented Groundwater takes in the Lower Hutt GMZ, consented abstraction rates and actual use.

Consent Holder	Aquifer	Consented Take (m^3/day)	Consented Take (m^3/year)	Actual Usage[1]
Hutt Valley Health	Waiwhetu	450	n/a	No Data
Boulcott Golf Club	Waiwhetu	400	80,000	0-54 % (no take recorded before 9/4/13
Woolyarns Ltd	Taita Alluvium	286	104,000	No Data
NZTS Ltd	Waiwhetu	143	51,936	0-55 % (no take recorded after 2/7/13)
Imperial Tobacco NZ	Waiwhetu	65	23,660	18-19 %
Petone Pure Water Ltd	Waiwhetu	50	18,200	No Data
Teri Puketapu	Waiwhetu	43	15,725	No Data
Hutt City Council	Waiwhetu	30	10,920	51-55 %
Department of Conservation	Waiwhetu	24	8,736	No Data
Total		96,458	33.7×10^6	24.0×10^6 (estimated)[2]

Notes:

1. *Approximate usage of annual take based on data from July 2012 – June 2014*
2. *Approximate actually annual usage, based on maximum annual take data and, where no data exists, consented annual volumes.*

Abstraction by GWRC for water supply purposes accounts for approximately 90 % of the total annual consented abstraction from the Lower Hutt GMZ. The current Unilever take consent is the second largest in the GMZ. However, this is only 3% of the GWRC annual take. Actual abstraction data show that all consent holders take less groundwater than their consented annual takes, with most taking < 60 % of their consented annual abstraction.

GWRC indicate that 32.85×10^6 m^3 is the current maximum annual abstraction volume from the Lower Hutt GMZ (GWRC, 2012). This maximum volume is a hypothetical value derived from numerical modelling, and set to protect against adverse effects, including saline intrusion. Currently, the total consented annual take from the Lower Hutt GMZ is 33.7 x 10^6 m^3, and by this measure the resource is currently over allocated by 8.5 x 10^5 m^3/year or by 3 %. However, the amount of groundwater actually abstracted is conservatively estimated above (Table 1) to be 24.0 x 10^6 m^3, which is 27 % less than the annual allocated volume. Current abstraction therefore lies within the maximum allocated volume.

Although recently Unilever have not been utilising its full consented allocation, the site use is proposed to change. PDP have been advised that the full consented volume will be required by the Applicant's lessee for production purposes.

Recent groundwater flow modelling commissioned by GWRC suggests that the sustainable groundwater abstraction for this GMZ is 36.5 x 10^6 m^3/year (Gyopari, 2014). GWRC has recommended in a technical report to support draft changes to the regional plan that the groundwater allocation for the Lower Hutt GMZ is increased to this value based on these findings (GWRC, 2014a). This new value is included in the draft Natural Resources Plan for the Wellington Region (GWRC, 2014b). Although the plan is not yet operative, GWRC have indicated that for GMZs where the revised allocation limit has increased, they will consider each consent application on a case-by-case basis taking into account the proposed limits (GWRC, 2015).

5.0 Assessment of Effects

5.1 Introduction

PDP has met with the Senior Environmental Scientist (Groundwater) at GWRC, to discuss the potential environmental effects GWRC will be concerned about with respect to this take. The regional council is mostly concerned about saline intrusion potential, and whether trigger levels intended to warn of such potential will be activated by the Unilever take. This could affect the amount of water taken for municipal supply by GWRC from the Waterloo wellfield.

This section also assesses effects on neighbouring bores and associated groundwater takes, stream depletion and land subsidence.

5.2 Saline Intrusion Risk

5.2.1 Risk Management Framework

The regional council has installed a number of monitoring wells along the Petone foreshore, and further inland, to monitor the potential for coastal saline intrusion. Water level and conductivity triggers have been set several years ago to guard against, and provide early warning of the potential for, saline intrusion. These triggers were recently reviewed and confirmed for the council, and incorporated into a broader saline intrusion monitoring framework by Gyopari (2014).

Saline intrusion could conceptually occur within the Hutt aquifer system by either one or two of the following mechanisms (Gyopari, 2014):

- Inland migration of an offshore saline water interface; and
- Backflow of saline waters through submarine discharge sites proximal to Petone foreshore.

There is currently no evidence for the presence of saline water within the Waiwhetu aquifer at some distance offshore. However, it is possible that there could be some areas of enhanced hydraulic connection between the aquifer and the sea. This could be through areas of weaknesses in the aquitard, or where it is thinner or absent.

The potential for an offshore saline water interface has been tested by numerical modelling. The study found that if an offshore connection between the aquifer and the sea is assumed, groundwater heads beneath the harbour cannot be calibrated to their current levels, i.e. pressure in the Waiwhetu aquifer cannot be maintained (Gyopari, 2014). The presence of an offshore saline water interface is therefore considered to be unlikely, and backflow of saline waters through submarine vents is therefore the most likely mechanism of saline intrusion.

Three types of triggers are defined in the framework. These are:

- Groundwater levels in saline intrusion monitoring wells (R27/0122, and R27/7154),
- Electrical conductivity values measured in monitoring wells, and
- The direction of hydraulic gradients between well pairs.

Figure 3 shows the location of the relevant monitoring wells and well pairs used to assess hydraulic gradients by Gyopari (2014). A positive hydraulic gradient refers to a hydraulic gradient indicating flow towards the sea. Table 2 outlines the trigger levels set by GWRC, and the corresponding recommended management responses for the Waterloo wellfield.

GWRC is concerned about the impact of this take on the saline intrusion monitoring well in McEwan Park, Petone (R27/0122), and the potential for local drawdown impacts at this location to affect saline intrusion triggers. This is the closest saline intrusion monitoring well to the Unilever site, and is located around 371 m south of the Unilever site abstraction bores.

Table 2: Saline intrusion trigger levels in R27/0122 and R27/7154, and management responses to triggers, adapted from Gyopari (2014)

Stand-by Level	Response
Groundwater level: R27/0122 or R27/7154: < 2.5 m amsl[1] and: Offshore and onshore gradients positive[2] and: EC[3] < 150 µS/cm Upper Waiwhetu EC < 250 µS/cm Lower Waiwhetu	Wellfield operators on stand-by to adjust abstraction rates
Alert Level	**Response**
Groundwater level: R27/0122 or R27/7154: < 2.3 m amsl and/or: Onshore gradients positive or negative, offshore gradients positive and: EC < 150 µS/cm Upper Waiwhetu EC < 250 µS/cm Lower Waiwhetu	Perform weekly water quality monitoring. Wellfield operators required to decrease abstraction.
Minimum Level	**Response**
Groundwater level: R27/0122 or R27/7154: < 2.0 m amsl and/ or > 1 offshore gradient negative EC > 150 µS/cm Upper Waiwhetu EC > 250 µS/cm Lower Waiwhetu	Water quality investigation. Wellfield operators required to decrease abstraction to maintain level at > 2.0 m asl, or until water quality improves.

Notes:

1. *Groundwater Levels are 24 hour means and measured above mean sea level (amsl).*
2. *Hydraulic gradients are shown in Figure 3.*
3. *Electrical conductivity measured in Petone foreshore monitoring wells*

Bulk water supply for the Wellington region is mostly sourced from the Waterloo wellfield and the Hutt River at Kaitoke, and is augmented by other surface water takes. During a drought when river levels are low, the groundwater supply is relied on to make up the difference in so far as that is possible. The principal concern of GWRC is that local effects from this take during a drought could cause the triggers to be breached, meaning bulk water abstraction from the wellfield would have to decrease when it is most needed.

The following sections assess the potential impacts of the proposed consented take on the trigger levels.

5.2.2 Drawdown Effects on R27/0122

5.2.2.1 Calculated Drawdown Interference

Drawdown interference, as a result of abstraction from the Unilever site has been calculated at R27/0122 using the Theis (1935) solution. Using conservative hydraulic properties of 28,000 m^2/day and 6.4 x 10^{-4} for the transmissivity and storativity, respectively, drawdown is predicted to be 0.09 m after pumping at the maximum proposed rate of 2,543 m^3/day for a full year. Drawdown is not expected to increase beyond this, as the Applicant plans to utilise the take for industrial purposes meaning that production, and consequently water use, will slow or cease during holiday periods, even if production is otherwise 24 hours a day seven days per week.

Leakage through the Wilford shell bed aquitard from the underlying Morea Gravels aquifer, will act to dampen the drawdown interference effect. However, since the Morea Gravel aquifer is confined, water will only be released from elastic storage, meaning leakage from this layer will not significantly reduce drawdown. Leakage from overlying layers is not expected to reduce drawdown, as at this distance from pumping bore(s), the static vertically upwards hydraulic head gradient will be preserved.

5.2.2.2 Effects of Historical Unilever Pumping

No pumping test was undertaken as part of this assessment. However, historic Unilever abstraction data records are available. Figure 4 shows a graph of Unilever abstraction data, together with groundwater levels in R27/0122, and monthly rainfall. This figure shows that there is no obvious recovery in groundwater levels in the monitoring well in response to the decreasing rate of abstraction through time.

Figures 5 and 6 compare daily Unilever abstractions to groundwater levels in R27/0122 during the first and second halves of 1996, when abstraction from the Unilever site was at its highest. Again, there is no obvious correlation between decreases in groundwater level and increases in pumping rate, implying that the effect of pumping from the Unilever site on R27/0122 is minimal.

5.2.2.3 Effects of GWRC Bulk Water Supply Abstraction

Bulk water supply abstraction by GWRC has moved to more inland locations through time as saline intrusion concerns have increased. Prior to 1982, GWRC abstracted groundwater for public supply from the Gear Island wellfield, which is comprised of three bores and situated around 600 m north of monitoring well R27/0122 (marked on Figure 3). Between 1982 and 2001, GWRC abstracted water from both the Waterloo wellfield (located around 2.8 km north-north-east of R27/0122 and also marked on Figure 3) and the Gear Island wellfield. Since 2001, bulk water supply abstraction has solely been from the Waterloo wellfield to protect against saline intrusion. The most recent, prolonged abstraction from the Gear Island wellfield took place in 1999.

Figure 7 compares abstraction from the Waterloo wellfield with groundwater levels in monitoring well R27/0122 and monthly rainfall[1] during 2013. Due to the high transmissivity of the aquifer, and the large abstraction volumes, drawdown interference effects are evident at R27/0122. Figure 7 shows how the fluctuations in pumping rate cause corresponding fluctuations in the groundwater level.

In March 2013, drawdown of approximately 0.6 m occurred in response to an increase in pumping rate at Waterloo from 60,000 – 99,710 m^3/day. As the pumping rate subsequently declined, groundwater levels recovered quickly, as is expected in a high transmissivity aquifer. This increase up to 99,710 m^3/day caused GWRC to exceed its consented take. Such an increase in pumping rate could cause the alert level to be breached, particularly during a drought period, when groundwater levels are depressed.

At present, fluctuations in pumping rate at Waterloo have the most significant influence on 24-hour mean water levels in monitoring well R27/0122. Using the Theis equation, and the hydraulic property values outlined above, drawdown is expected to be 1.99 m after 365 days pumping at the maximum consented rate from the Waterloo wellfield. The expected drawdown due to pumping at the proposed maximum rate from the Unilever site (0.09 m after 365 days) is just 4 % of the maximum drawdown expected from the Waterloo wellfield. This is an insignificant amount relative to water level fluctuations, which are primarily influenced by GWRC bulk supply abstraction and recharge.

Figure 8 shows historic Unilever abstraction data from 1970 – 1991. From 1970 – 1978, Unilever consistently abstracted > 2,500 m^3/day. During this period, all bulk water supply from the aquifer was sourced from the Gear Island wellfield. Drawdown effects on monitoring well R27/0122 during this time interval should

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[1] Summed monthly rainfall at Trentham. While the recharge from the Hutt River at Taita (and therefore groundwater levels) is likely to reflect rainfall from further up in the Hutt catchment, summed monthly rainfall from Trentham is considered likely to mirror trends in the upper catchment.

therefore be most pronounced, and greater than from combined pumping from the Waterloo wellfield and the Unilever site.

Figure 9 shows a plot of groundwater levels in monitoring well R27/0122 through time from 1971 to 2014 compared with monthly rainfall. Between 1971 and 1978, groundwater levels dropped below the saline intrusion minimum level (2 m amsl) on five occasions, and for all but one year, annually dropped below the saline intrusion alert level (2.3 m amsl).

Following the transfer of part of the bulk water supply abstraction to Waterloo in 1981, there is a noticeable recovery in groundwater levels, while there is no obvious change in rainfall. However, any recovery associated with the decreasing abstraction from the Unilever site in 1978 is not possible to identify. This further supports the conclusion that the effect of the groundwater take from the Unilever site on R27/0122 is insignificant relative to the GWRC bulk water supply abstraction.

5.2.2.4 Effects on Trigger Levels in Monitoring Well R27/0122

Since 1982, from when abstraction from Gear Island decreased, the saline intrusion alert level has not have been breached, and the stand-by level has been breached on only six occasions. Abstraction for water supply purposes ceased from Gear Island entirely in 2001, and the stand-by level has been breached once since this time. This is most likely during lower groundwater levels in summer, in response to lower flows in, and lower aquifer recharge from, the Hutt River.

A hypothetical scenario was considered whereby 0.09 m of drawdown was applied to the historical groundwater level hydrograph for monitoring well R27/0122. This was a conservative assessment designed to demonstrate the potential influence of the proposed take on the trigger levels. This assessment indicates that the stand-by level would have been breached on five occasions since 2001. However, the alert level would not have been triggered. This assessment is conservative, because Unilever were pumping during this time, albeit at a reduced rate, and therefore some drawdown at R27/0122 was already occurring. This means the same drawdown is counted twice.

This drawdown effect is local and will not increase the risk of saline intrusion in the Waiwhetu aquifer. It is possible that the proposed abstraction could occasionally contribute to trigger levels being breached. This in turn would require a reduction in other abstractions, particularly the GWRC bulk water supply abstraction. We suggest that GWRC consider decreasing the stand-by trigger level to 2.45 m amsl in monitoring well R27/0122. This would prevent unnecessary abstraction reductions caused by the local effect of pumping from the Unilever site.

Due to the much greater abstraction, and high aquifer transmissivity, bulk water supply abstractions have historically masked drawdown interference effects on monitoring well R27/0122 caused by abstraction by Unilever. The effect of this is that if breaches do occur, it is not possible to determine whether the breach is a result of the bulk water abstraction or some other abstraction, for example from the Unilever site.

5.2.3 Drawdown Effects on other Monitoring Wells

The next closest monitoring well is R27/7154, located around 1.75 km west-northwest of the Unilever site along the Petone foreshore. Figure 3 shows the location of this bore. Using the Theis method, and the same hydraulic parameters outlined above, drawdown interference effects of around 0.07 m are expected after pumping from the Unilever site for one year at 2543 m^3/day. This monitoring site has only been operating since 2008, and saline intrusion trigger levels are yet to be breached (as of 2014).

Monitoring well R27/7154 is located further away (3.3 km) from the Waterloo wellfield than monitoring well R27/0122, meaning drawdown interference effects from bulk water supply abstraction will be less pronounced than in R27/0122. Even so, it is expected that effects from the Unilever site will be difficult to distinguish, and effects on groundwater level will be small (≤ 0.07 m).

5.2.4 Effects on Hydraulic Gradients

Figure 3 shows the locations of well pairs which define hydraulic gradient triggers in the proposed saline intrusion monitoring framework. The gradients to be most affected by this abstraction will be those closest to the Unilever site; onshore between Randwick (monitoring well R27/1122) and McEwan Park (R27/0122); and offshore between McEwan Park (R27/0122) and Somes Island (monitoring well R27/(1171). The effect of drawdown on monitoring well R27/0122 will be greater than at Randwick monitoring well since R27/0122 is closer to the Unilever site, thereby increasing the onshore gradient (Randwick to McEwan Park) towards the coast. Therefore, the proposed take will not increase the probability of the hydraulic gradient trigger being beached. However, drawdown at monitoring well R27/0122 is predicted to be greater than at Somes Island (R27/1171), meaning the offshore gradient between McEwan Park and Somes Island will reduce.

Figure 10 shows groundwater level time series data for monitoring well R27/1171 (Somes Island) and monitoring well R27/0122 (McEwan Park) and the head difference between them through time. Groundwater levels in both monitoring wells follow the same trend, indicating that they are both influenced by bulk water supply abstraction further up the aquifer. Since May 1993, a period which includes when the Gear Island wellfield was pumping, offshore hydraulic gradient between R27/0122 and R27/1171 has reversed (indicating flow towards land) on 23 days (calculated using 24 hour means of water level). These reversals are small (maximum head difference of -0.11 m), isolated incidents, and are well correlated with increased bulk water supply abstraction which causes groundwater levels to decrease abruptly. Table 3 details the most recent three reversals.

Table 3: Gradient reversals and associated GWRC abstraction for July 2012 – June 2014		
Reversal Date	**Head Difference (m)**	**Waterloo Pumping – change in pumping from previous day**
29/8/2012	-0.04	Increase from 73,140 to 94,480 m^3/day
6/5/2013	-0.07	Increase from 64,200 to 94,070 m^3/day
15/5/2014	-0.07	Increase from 63,300 to 78,300 m^3/day

When abstraction from the Waterloo wellfield increases sharply, effects will be observed first at monitoring well R27/0122, before taking time to propagate out to Somes Island (monitoring well R27/1171). As is discussed earlier, drawdown at R27/0122 due to pumping the Unilever bores at the proposed rate for one year is predicted to be 0.09 m. Using the Theis equation and the same parameters and conditions as above, drawdown at monitoring well R27/1171 (3.47 km south) is predicted to be 0.06 m. This corresponds to an estimated small decrease in the head at R27/1171 of only 0.03 m.

Since 2002, when the Gear Island wellfield ceased regular abstraction, the gradient reversed on eight occasions. Taking into account the predicted 0.03 m difference, the gradient would have reversed 20 times over this same period if the Unilever bores were pumping at the maximum rate, an increase of 12 occasions. This assessment is conservative, because, as noted above, Unilever were actually pumping during this time, albeit at a reduced rate. Although the number of reversals is predicted to increase, the magnitude of the head difference is low for these occasions, and they remain isolated events primarily driven by sharp increases in abstraction rates from the Waterloo wellfield.

The timeframe over which the hydraulic gradients are to be considered for the purposes of assessing triggers is unclear. PDP recommend assessing the 7-day averaged hydraulic gradients. This would provide a more reliable indication of saline intrusion risk and will prevent short duration pumping spikes from GWRC from disrupting groundwater users in the Lower Hutt GMZ (including GWRC).

5.2.5 Overall Effects and Management

Effects on the trigger levels in the proposed saline intrusion management framework will be dominated by abstraction from the Waterloo wellfield.

Nevertheless, trigger levels consistent with the management framework should be applied to the consent. PDP suggest that a series of conditions are applied to the consent, with appropriate responses by the Applicant. These are outlined in Table 4. These have been derived by calculating the necessary reduction in pumping rate to reduce the observed drawdown in monitoring well R27/0122. Owing to the high transmissivity of the aquifer, any decrease in pumping rate will cause groundwater levels to rapidly recover in the monitoring wells.

Since the proposed abstraction is just 3 % of the consented GWRC bulk water supply take, the effects on drawdown in R27/0122 from GWRC's take at Waterloo will be much greater, and it is unlikely that the effect of reducing abstraction from the Unilever site will be noticeable relative to fluctuations from Waterloo.

Table 4: Proposed responses by the Applicant to trigger levels being reached

Level	Type	Response
Stand-by level	Groundwater Levels R27/7154: ≤ 2.5 m amsl Groundwater levels R27/0122: < 2.45 m amsl	Applicant is notified by GWRC. Be prepared to take action.
Alert Level	Groundwater Levels ≤ 2.3 m amsl[1] or negative onshore gradient(s)[2]	Reduce maximum pumping rate by 25 % (2,034 m^3/day). This reduces drawdown to 0.045 m after 7 days pumping[3].
Minimum Level	Groundwater Levels ≤ 2 m amsl[1] or negative offshore gradient(s)[2] or > 150 µs/cm	Reduce maximum pumping rate by 50 % (1,260 m^3/day). This reduces drawdown to 0.03 m after 7 days pumping[3].
7 days at Minimum Level		Cease pumping

Notes:

1. *Trigger level in metres above mean sea level, and calculated as 24 hour mean value measured in R27/0122 or R27/7154.*
2. *Gradient calculated as 7 day mean.*
3. *Prediction calculated using Theis equation. Drawdown after 7 days pumping at maximum rate is 0.06 m.*

Correct ✓

Between July 2012 and June 2014, GWRC exceeded its daily consented take 14 times, by up to 16,595 m^3/day. As historical data demonstrates, GWRC bulk abstraction greatly influences the triggers, in particular, groundwater levels in monitoring well R27/0122. Such an exceedance of the GWRC consented take could cause trigger levels to be breached. This would not be caused by the Applicant's pumping, and if this were the case PDP suggests that the Applicant is allowed to continue abstracting at the same consented rate.

Based on analysis of the historical data, it is considered unlikely that given current conditions, the minimum or alert levels would be breached. This could change with sea level rise or during an exceptional drought. In comparison to the GWRC take at the Waterloo wellfield, this take is relatively small, and effects on the hydraulic gradient and saline intrusion monitoring wells are expected to be similarly minor. Hence, the proposed triggers are considered sufficient to protect against saline intrusion.

5.3 Drawdown Effects on Neighbouring Bores

The closest consented groundwater abstraction to the Unilever site is Shandon Golf Club. According to GWRC, the golf club's bore is located around 355 m northeast of the Unilever site. Using the Theis method, with the hydraulic properties specified above, drawdown in the Shandon Golf Club abstraction bore is expected to be 0.08 m after 365 days of continuous pumping at the maximum proposed rate (2,543 m^3/day). This drawdown interference effect is minimal, and will not affect the ability of Shandon Golf Club to abstract groundwater. Effects on other neighbouring bores are expected to be much less and, as such, neighbouring groundwater users will not be affected.

5.4 Stream Depletion Effects

The Hutt River is the nearest surface water body to the abstraction bores, with the true right bank located approximately 460 m to the east of the Unilever bores. A blind channel (the Dead Arm) of the Hutt River lies 150 m north-east of the bores.

Taking groundwater from the Waiwhetu aquifer causes more water to be drawn from the Hutt River where the aquifer is unconfined. However, this take is relatively small compared to the Waterloo wellfield bulk supply take. Any additional effects on the Hutt River in the reach where the aquifer is unconfined will be minimal in comparison to this.

Stream depletion in the immediate vicinity of the bores is unlikely to be significant. Due to the high transmissivity of the aquifer, drawdown effects will be small. The presence of the Petone Marine Beds confining layer will cause limited leakage from the surface and mean drawdown effects at the surface will be small and widespread, thereby minimising any direct stream depletion effects.

In addition, the amount of possible leakage will be very small relative to the flow in the river, even at summer low flows.

In summary, stream depletion affects will be below the level requiring an abstraction restriction, and any long-term depletion effects are most appropriately managed by the groundwater allocation limits already set (or proposed) for the area. As mentioned above, the groundwater resource in the Lower Hutt GMZ is currently slightly over the current allocation limit. However, this allocation limit is proposed to be increased above the current consented allocation, and effects on the surface water bodies are expected to be less than minor.

5.5 Subsidence

Due to the high transmissivity of the aquifer, drawdown is not expected to be significant, and consequently subsidence will not occur.

6.0 Conclusions

From the assessment of current consented takes and the AEE, the following conclusions can be made:

- The Applicant wishes to renew the current take consent for the same volume, being 2,543 m^3/day and 9.26 x 10^5 m^3/year. Although the consent is not currently utilised to the full degree, the site is to be purchased by Primeproperty Group, and leased for industrial purposes. It is understood that the full take will be required by the lessee company.
- It is understood that GWRC proposes to increase the groundwater allocation of the Lower Hutt GMZ. Whilst the resource is theoretically currently over allocated by 8.5 x 10^5 m^3/year, the revised allocation is greater than that currently consented. GWRC has indicated it will assess each new consent or renewal on a case-by-case basis taking the revised allocation into account.
- GWRC is most concerned about the effect the take may have on the saline intrusion monitoring framework and the potential increased frequency of trigger levels being activated. Effects on the nearby saline intrusion monitoring well R27/0122 are of most concern because it is to be used as an indicator for regional saline intrusion risk.
- Drawdown in monitoring well R27/0122 as a result of the proposed take is not expected to exceed 0.09 m. Historically, fluctuations in water level in R27/0122 have been dominated by bulk water supply abstraction by GWRC. Given the much larger effects from the Waterloo wellfield, it is unlikely that drawdown effects from the Unilever bores will be distinguishable from that caused by pumping from the Waterloo wellfield. Nevertheless, abstraction at the proposed rate from the

Unilever site could cause the existing saline intrusion stand-by trigger level to be breached more regularly. However, historical monitoring shows the likelihood of actual saline intrusion at this trigger to be minimal, and the small additional local drawdown from the Unilever bore will not change this.

- To avoid unnecessary and irrelevant triggers, it is suggested that GWRC consider decreasing the stand-by level to 2.45 m amsl in R27/0122. This would prevent the local effect from this take from influencing groundwater abstraction elsewhere in the Lower Hutt GMZ, and would not increase the risk of saline intrusion in the Waiwhetu aquifer.
- In the saline intrusion management framework, PDP suggest that a 7-day mean is used to assess the offshore hydraulic gradient between R27/0122 (McEwan Park) and R27/1171 (Somes Island). This is to prevent small, isolated reversals caused by abrupt increases in abstraction from the Waterloo wellfield from disrupting groundwater users in the Lower Hutt GMZ. Two of the last three reversals have been caused by an increase in abstraction from the Waterloo wellfield above the consented rate.
- A change in head difference of 0.03 m is anticipated between McEwan Park and Somes Island, as a result of the proposed take. Given historical data, this is considered unlikely to cause an increase in the frequency of reversals in gradient. Abrupt increases in abstraction from Waterloo will continue to be the main driver for this trigger.
- To be consistent with the proposed saline intrusion management framework, PDP suggest that a series of triggers be applied to the Unilever abstraction. This involves progressive reduction in pumping from the Applicant's bore as the level of risk increases. Given current conditions, these measures will be sufficient to protect against the risk of saline intrusion.
- Due to the large transmissivity of the aquifer, drawdown on neighbouring bores will be limited, and no effects are envisaged. Likewise, any stream depletion effects are expected to be unnoticeably small and widely distributed.

7.0 References

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Greater Wellington Regional Council (GWRC) (2014a). *Water allocation recommendations for the Wellington region: Technical Report to support the draft Natural Resources Plan*.

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Theis, C. V. (1935). The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage. *American Geophysical Union Transcript* vol. 16, pp. 519-524.

Tonkin and Taylor (1997). *Groundwater Takes from the Waiwhetu Aquifer. Assessment of Environmental Effects*. Report for Dominion dyers Ltd, Feltex Carpets Ltd, NZTS Wellington, Seaview Wools Ltd, WD & HO Wills Ltd, and Unilever Ltd.

Wellington Regional Council (WRC) (1995). *Hydrology of the Hutt Catchment. Volume 2 – Groundwater Hydrology*. Wellington Regional Council Hydrological Services Group. May 1995. Pub No. WRC/CI_T_95/38.

Appendix A: Figures

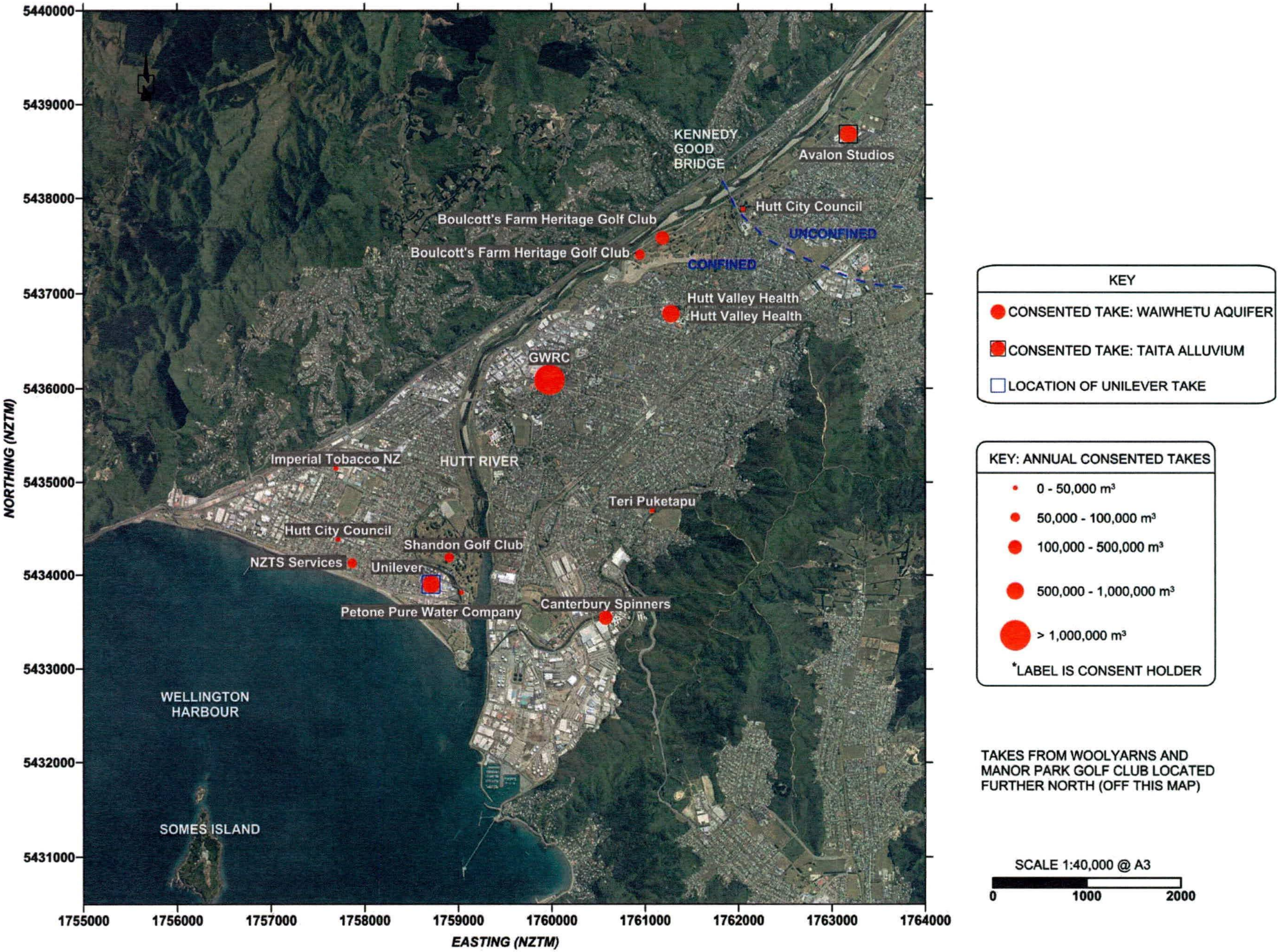
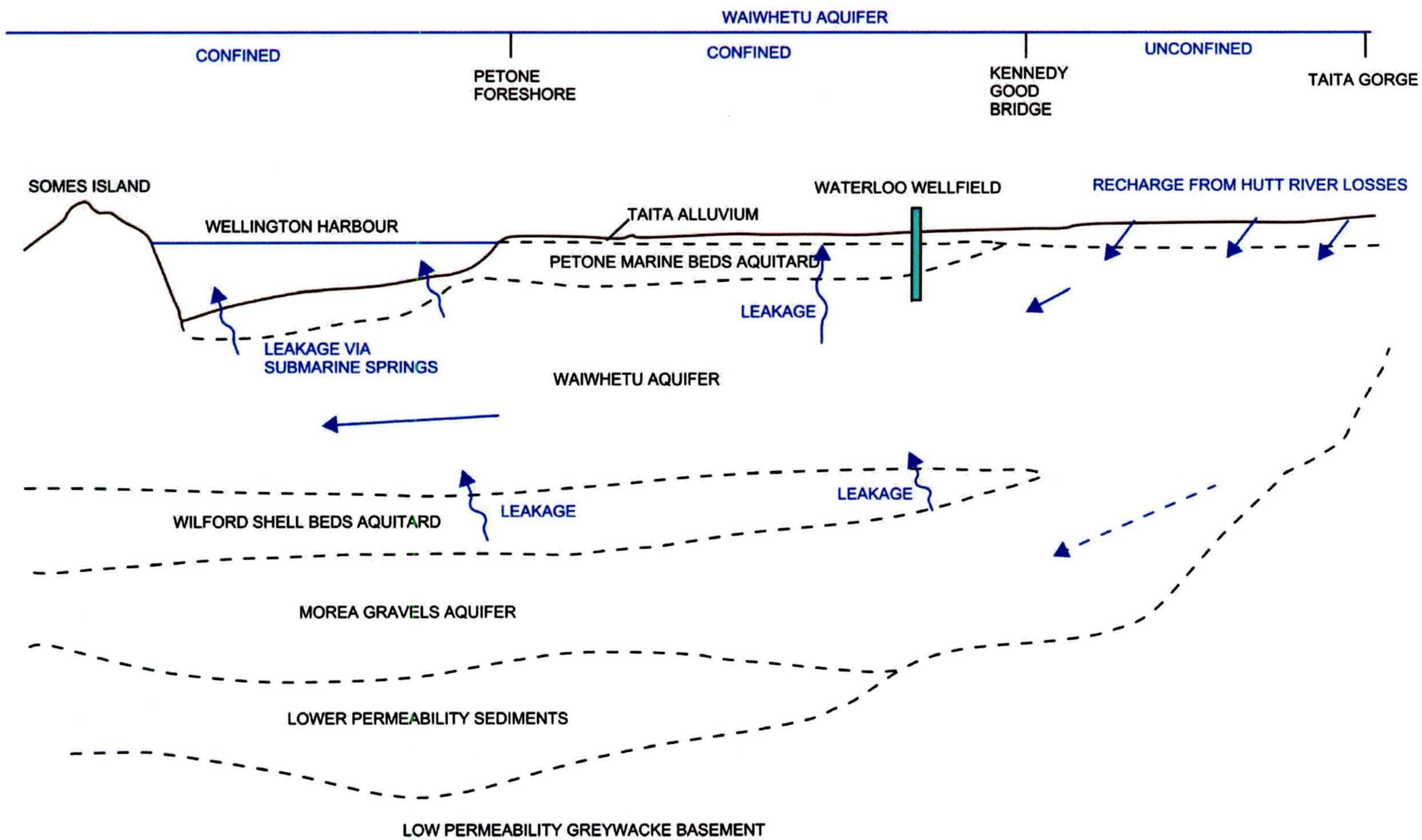


FIGURE 1: LOCATION OF UNILEVER SITE AND OTHER CONSENTED TAKES IN LOWER HUTT GROUNDWATER MANAGEMENT ZONE



NOT TO SCALE, ALL BOUNDARIES APPROXIMATE

FIGURE 2: CONCEPTUAL MODEL OF THE LOWER HUTT AQUIFER SYSTEM, ADAPTED FROM WRC (1995).

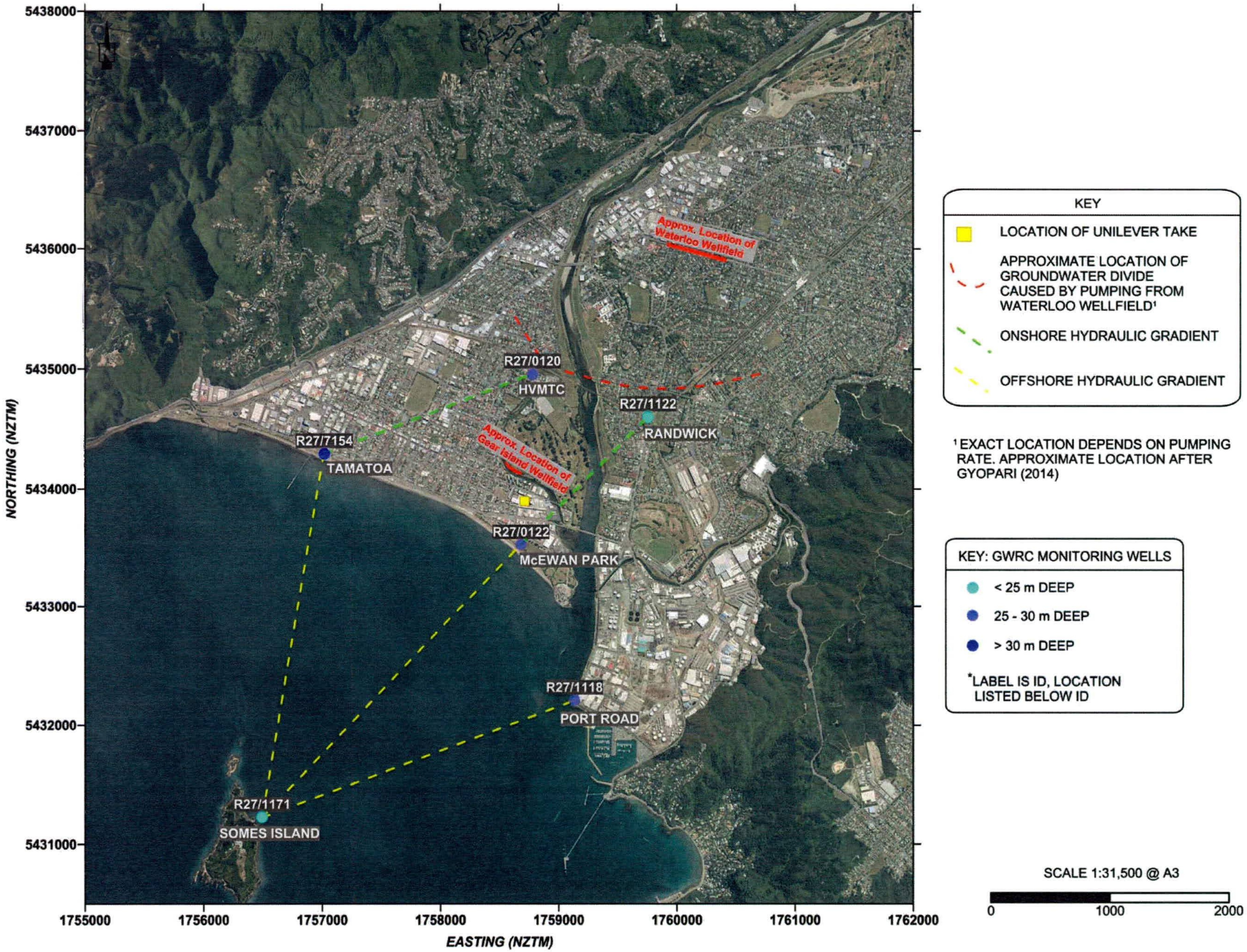


FIGURE 3: LOCATION OF MONITORING WELLS AND HYDRAULIC GRADIENTS WHICH FORM PART OF THE PROPOSED SALINE INTRUSION MONITORING NETWORK

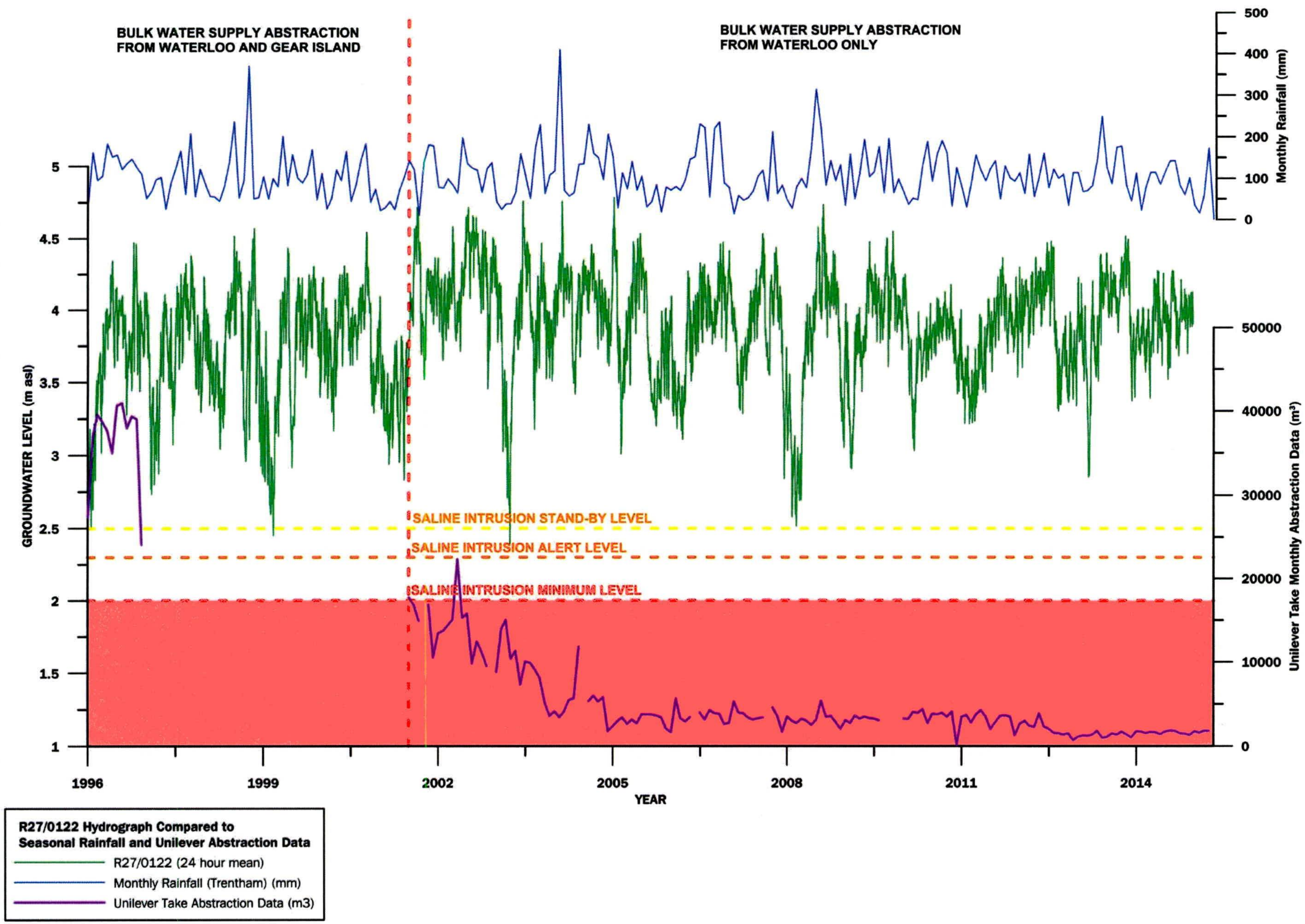


FIGURE 4: GROUNDWATER LEVEL HYDROGRAPH FOR GWRC MONITORING WELL R27/0122 COMPARED TO MONTHLY RAINFALL AND UNILEVER ABSTRACTION DATA

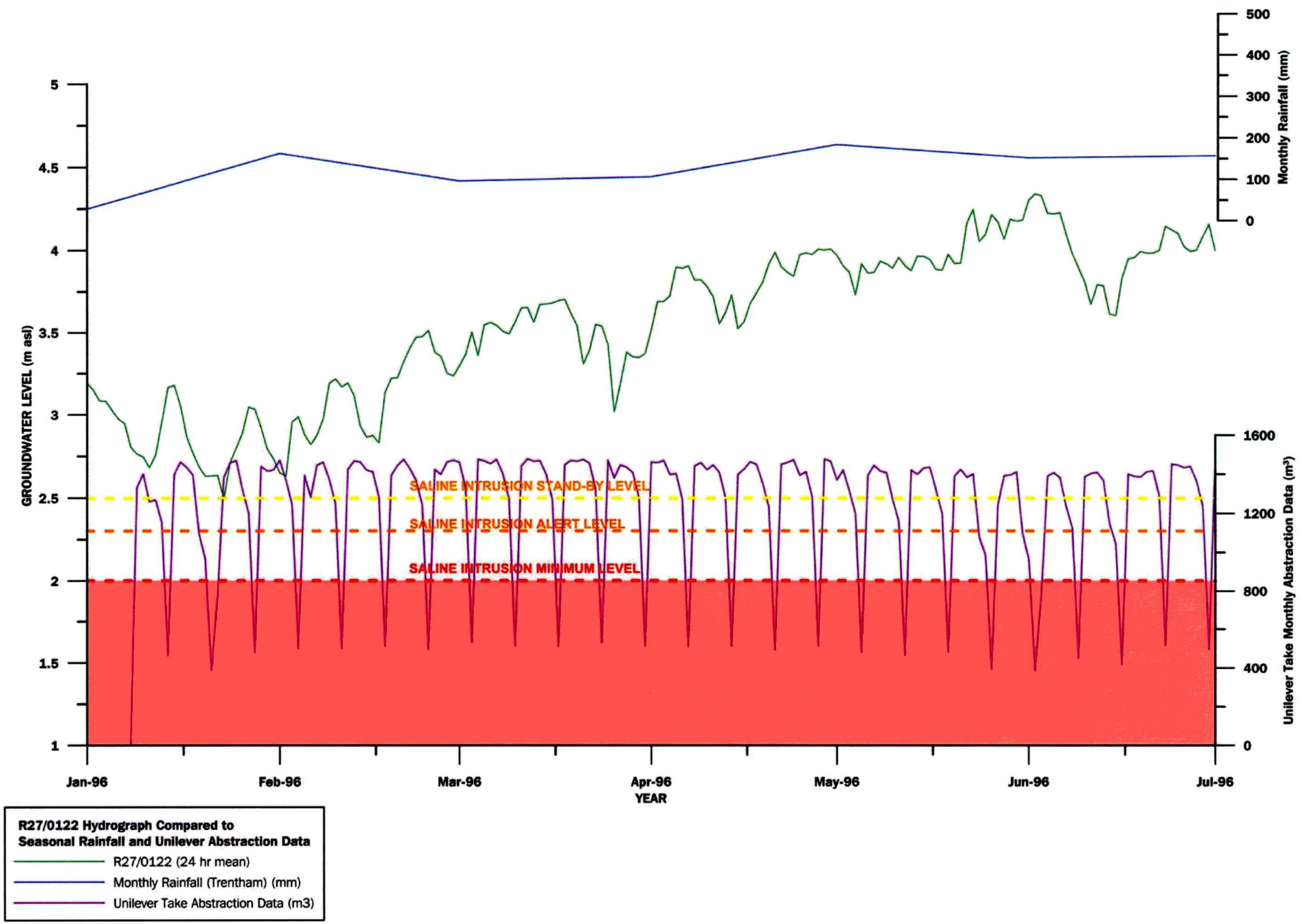


FIGURE 5: GROUNDWATER LEVEL HYDROGRAPH FOR GWRC MONITORING WELL R27/0122 COMPARED TO MONTHLY RAINFALL AND DAILY UNILEVER ABSTRACTION DATA FOR JANUARY - JUNE 1996

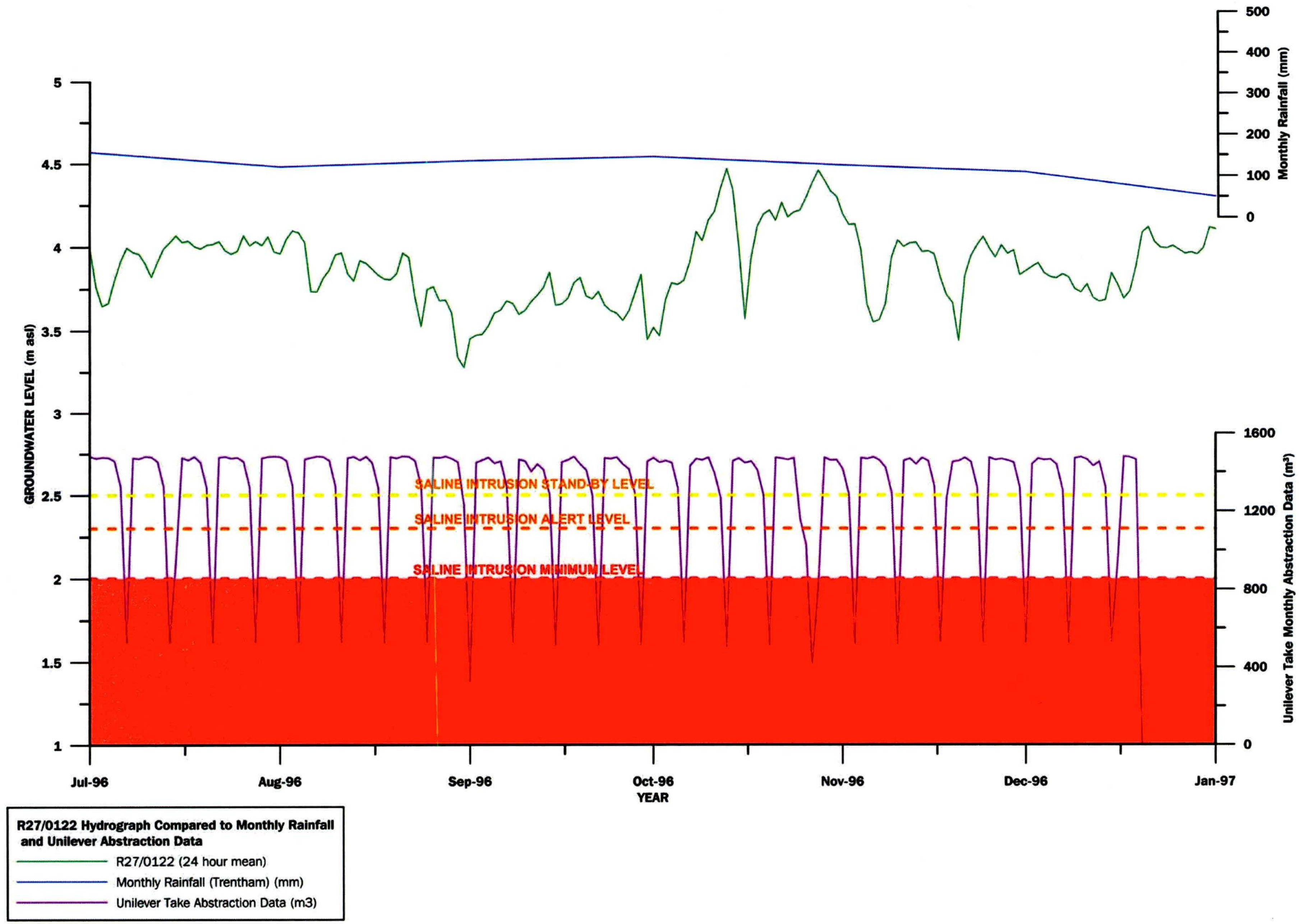


FIGURE 6: GROUNDWATER LEVEL HYDROGRAPH FOR GWRC MONITORING WELL R27/0122 COMPARED TO MONTHLY RAINFALL AND DAILY UNILEVER ABSTRACTION DATA FOR JULY - DECEMBER 1996

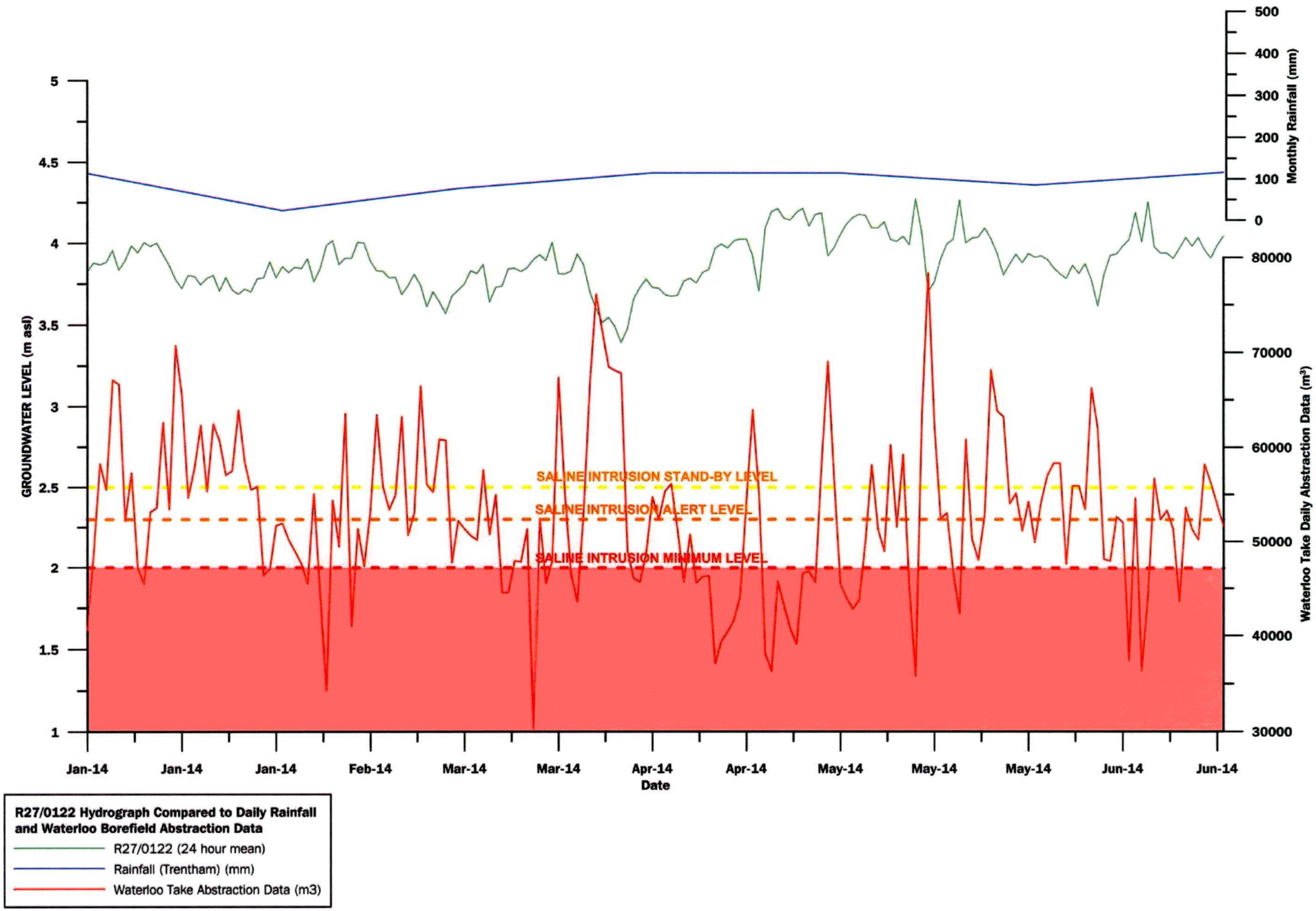


FIGURE 7: GROUNDWATER LEVEL HYDROGRAPH FOR GWRC MONITORING WELL R27/0122 COMPARED TO MONTHLY RAINFALL AND WATERLOO BOREFIELD ABSTRACTION DATA, JANUARY - JUNE 2014

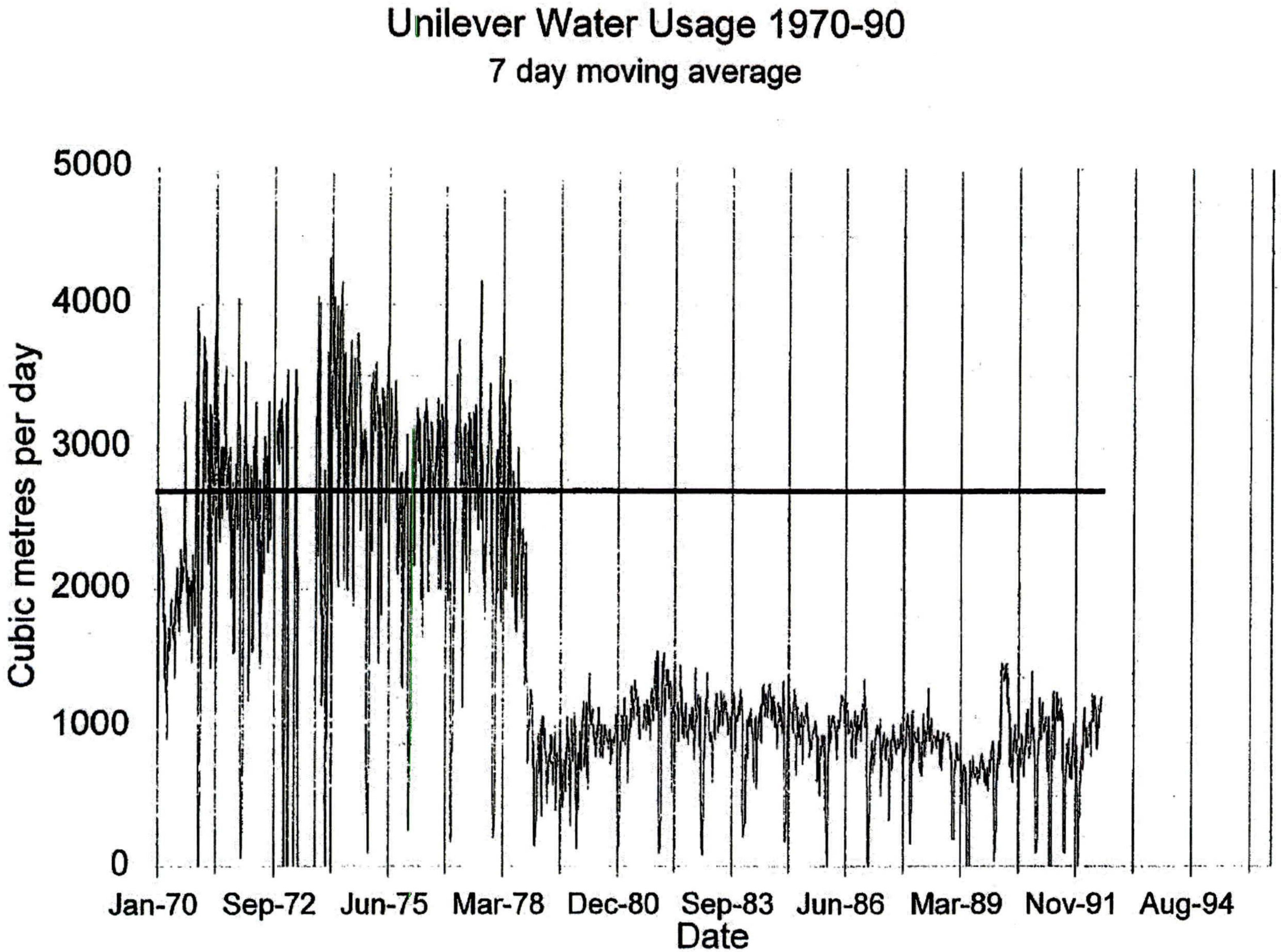


FIGURE 8: GRAPH OF ABSTRACTION FROM THE UNILEVER SITE FROM 1970 – 1993. THE HORIZONTAL LINE MARKS THE CURRENT CONSENTED DAILY TOTAL. GRAPH SOURCED FROM TONKIN & TAYLOR (1997)

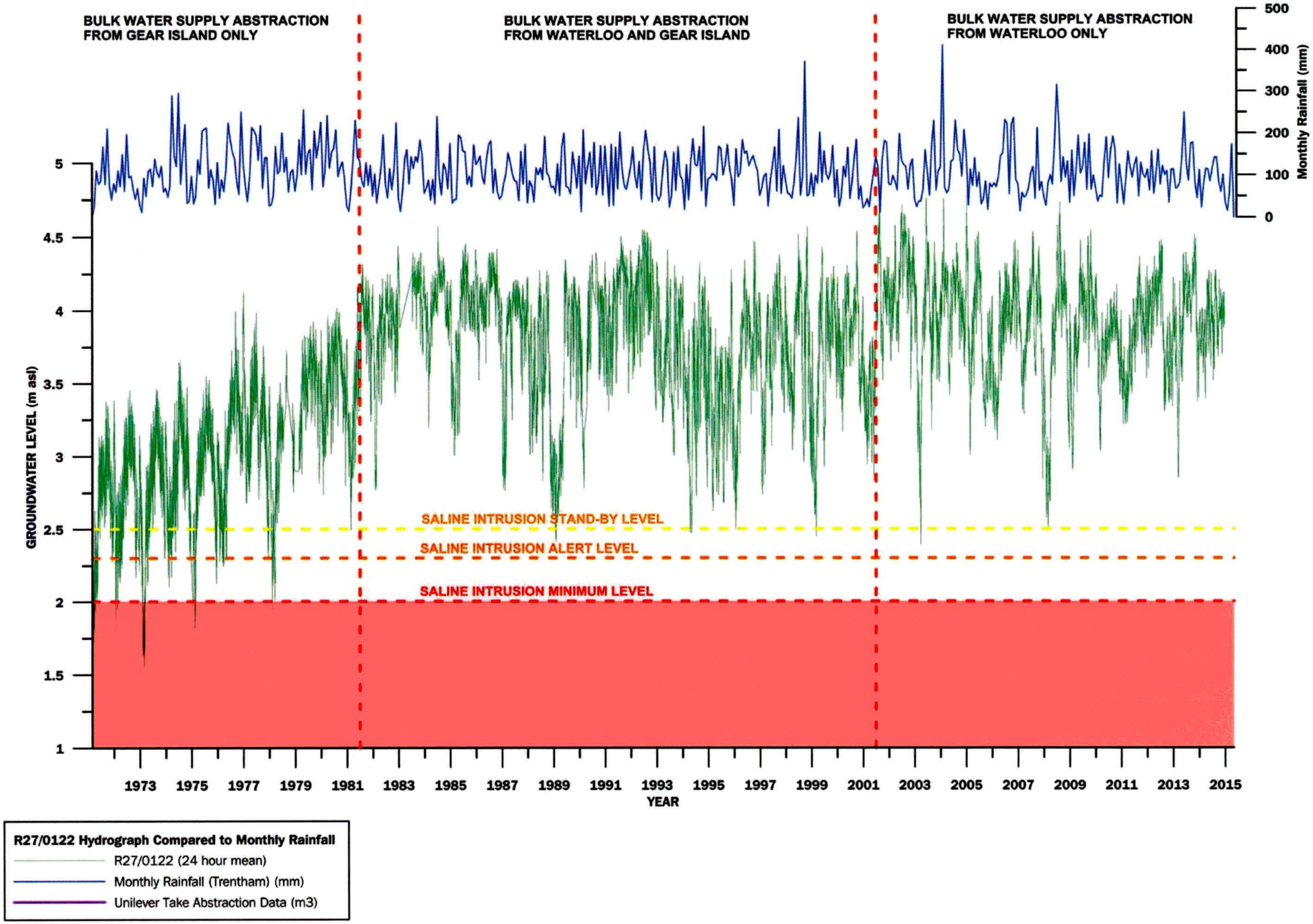


FIGURE 9: GROUNDWATER LEVEL HYDROGRAPH FOR GWRC MONITORING WELL R27/0122 COMPARED TO MONTHLY RAINFALL

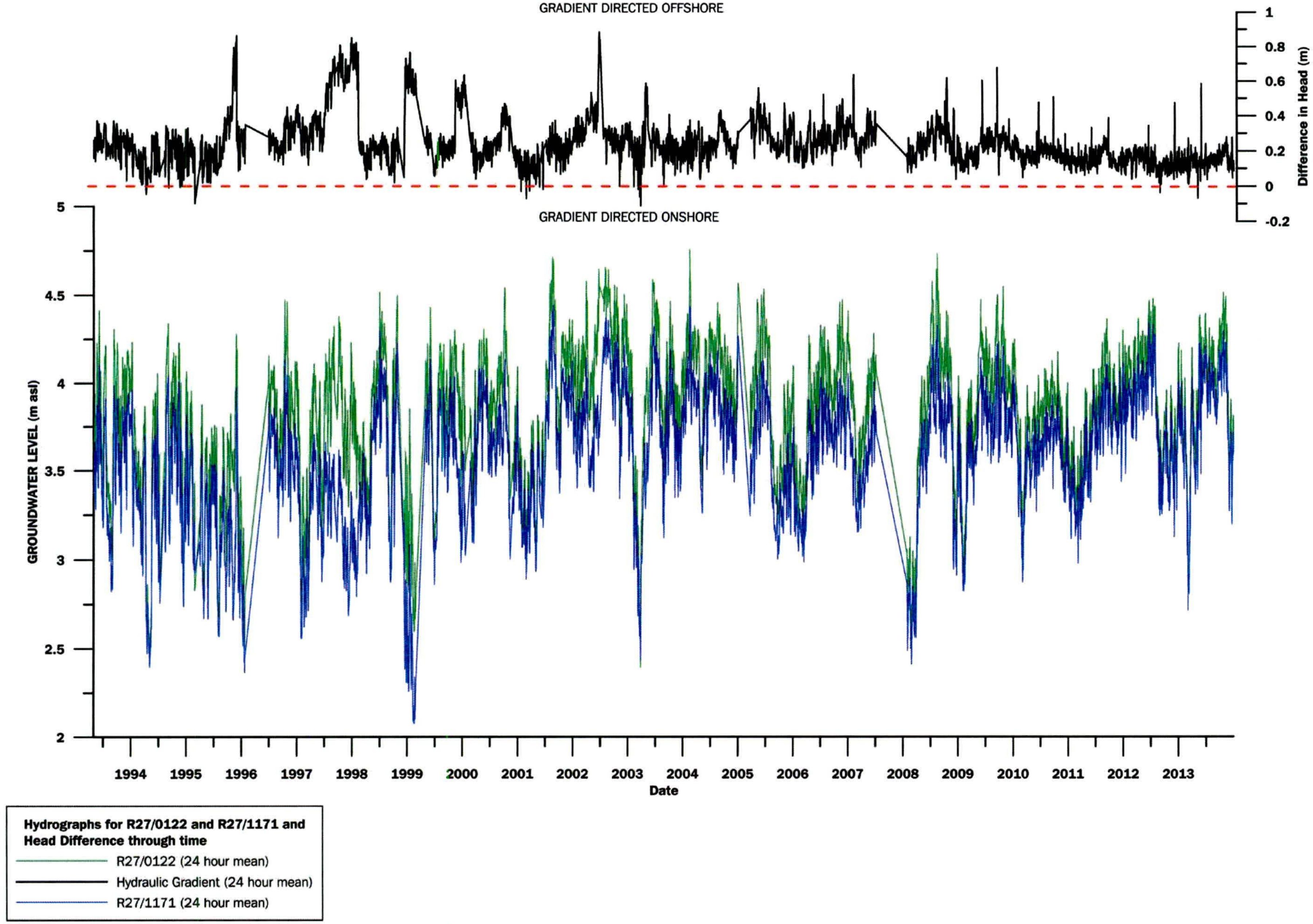


FIGURE 10: GROUNDWATER LEVEL HYDROGRAPHS FOR GWRC MONITORING WELLS R27/0122 AND R27/1171 TOGETHER WITH THE DIFFERENCE IN HEADS THROUGH TIME

Ian Leary

From: Ian Leary
Sent: Thursday, 21 May 2015 4:48 p.m.
To: [redacted]; [redacted]
Subject: Extension of Water Permit - 476-486 Jackson Street, Petone
Attachments: WGN_DOCS-#1117838-v1-New_consent_certificate_Unilever_(following_transfe....pdf

Kiaora Jennie/Reina,

We are currently under instructions from Prime Property Group (PPG) to lodge an application to the Greater Wellington Regional Council to extend an existing water permit for the land described as 476-486 Jackson Street, Petone.

This land is currently known as the Unilever Site. Unilever has an existing right to take water from the Hutt Aquifer.

The existing water permit and its conditions are attached to this email.

We are currently in the consultation stage, prior to lodging the application for an extension of the existing water permits, therefore we are writing to the Ngati Toa to obtain your views on this extension. The last extension was granted in 2007. I understand from Council records that no objections were raised by Ngati Toa at that time.

The existing water permits expire in 2017, however our clients are seeking an extension to the water permit prior to them taking possession of the site later this year.

PPG intend on maintaining the same conditions and same permitted water take, authorised by the existing permit. Unilever have had a right to draw water under the RMA since the coming into force of the Act in 1991. I also understand that their water take rights were in place many years before the RMA.

It is acknowledged that Unilever has been winding down its production in recent years prior to selling the site, however the long term effects of the water take have been established on this aquifer. Our client is seeking to confirm other industrial tenants for the site who will likely require water rights to operate and provide employment opportunities for the Hutt Valley and Wellington Region.

As part of the consultation process, we are seeking Ngati Toa's view on the extension of the existing permit. Unilever last sought the views of Tangata Whenua in 2007 when the most recent extension was granted. It is my understanding that no issues were raised at that time with the extension granted at that time.

Should you require any further information from us to form its views, please do not hesitate to contact me and I will do my best to provide that information.

Otherwise, I look forward to receiving the comments and views on the extension of the water permit.

Regards

Ian Leary
Director - Survey and Planning
SpencerHolmes Limited

PO Box 588, Wellington 6140
Level 6, 8 Willis Street, Wellington 6011
[redacted]

www.spencerholmes.co.nz
DDI [redacted] **M** [redacted] **P** 04-472-2261 **F** [redacted]

Please consider the environment before printing this email.

Ian Leary
Director - Survey and Planning
SpencerHolmes Limited

PO Box 588, Wellington 6140
Level 6, 8 Willis Street, Wellington 6011
[redacted]
www.spencerholmes.co.nz
DDI [redacted] **M** [redacted] **P** 04-472-2261 **F** [redacted]

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. **Ian Leary**

From: Ian Leary
Sent: Thursday, 21 May 2015 9:30 a.m.
To: [redacted]
Subject: Extension of Water Permit - 476-486 Jackson Street, Petone
Attachments: WGN_DOCS-#1117838-v1-New_consent_certificate_Unilever_(following_transfe....pdf

Kiaora Ben,

We are currently under instructions from Prime Property Group (PPG) to lodge an application to the Greater Wellington Regional Council to extend an existing water permit for the land described as 476-486 Jackson Street, Petone.

This land is currently known as the Unilever Site. Unilever has an existing right to take water from the Hutt Aquifer.

The existing water permit and its conditions are attached to this email.

We are currently in the consultation stage, prior to lodging the application for an extension of the existing water permits, therefore we are writing to the Wellington 10ths Trust to obtain your views on this extension. The last extension was granted in 2007. I understand from Council records that the Trust had no objection at that time to the extension.

The existing water permits expire in 2017, however our clients are seeking an extension to the water permit prior to them taking possession of the site later this year.

PPG intend on maintaining the same conditions and same permitted water take, authorised by the existing permit. Unilever have had a right to draw water under the RMA since the coming into force of the Act in 1991. I also understand that their water take rights were in place many years before the RMA.

It is acknowledged that Unilever has been winding down its production in recent years prior to selling the site, however the long term effects of the water take have been established on this aquifer. Our client is seeking to confirm other industrial tenants for the site who will likely require water rights to operate and provide employment opportunities for the Hutt Valley and Wellington Region.

As part of the consultation process, we are seeking the Tenths Trust views on the extension of the existing permit. Unilever last sought the views of the Trust in 2007 when the most recent extension was granted. It is my understanding that the Trust at that time, had no issues with the extension granted at that time.

Should the Trust require any further information from us to form its views, please do not hesitate to contact me and I will do my best to provide that information.

Otherwise, I look forward to receiving the comments and views of the Trust on the extension of the water permit.

Regards

Ian Leary
Director - Survey and Planning
SpencerHolmes Limited

PO Box 588, Wellington 6140
Level 6, 8 Willis Street, Wellington 6011
[redacted]
www.spencerholmes.co.nz
DDI [redacted] **M** [redacted] **P** 04-472-2261 **F** [redacted]

Please consider the environment before printing this email.

Ian Leary

From:	Ian Leary
Sent:	Thursday, 21 May 2015 7:35 a.m.
To:	'shandon@golf.co.nz'
Subject:	Renewal Of Water Permit - Unilever Site
Attachments:	150144c01 letter to Shandon Golf Club.pdf; WGN_DOCS-#1117838-v1-New_consent_certificate_Unilever_(following_transfe....pdf

Greg,

As discussed, please find attached letters regarding the renewal of water permits for the Unilever site.

Regards

Ian Leary
Director - Survey and Planning
SpencerHolmes Limited

PO Box 588, Wellington 6140
Level 6, 8 Willis Street, Wellington 6011
[redacted]
www.spencerholmes.co.nz
DDI [redacted] **M** [redacted] **P** 04-472-2261 **F** [redacted]

150144c01

20th May 2015

SpencerHolmes
engineers - surveyors - planners

PO Box 588
Level 6, 8 Willis Street
Wellington 6140, New Zealand
Phone 04 472 2261
Email admin@spencerholmes.co.nz

Shandon Golf Club Petone
P.O. Box 38104
LOWER HUTT

Attention: [redacted]

Dear Greg,

Water Permit Extension – Unilever Site – Jackson Street Petone

I am writing on behalf of our client Prime Property Group (PPG). PPG have purchased the Unilever site and are currently seeking a renewal of their existing water take permit. A copy of the existing permit is attached to this letter.

We are in the consultation stage of this application. The current permit does not expire till 2017 however PPG is seeking to confirm an extension to the existing permit prior to taking possession of the site later this year.

Greater Wellington Regional Council (GWRC) have asked us to consult with you. The current water permit was granted in 2007. At that time, Shandon Golf Club gave their written approval.

The current extension is to keep the same conditions and water allocation levels.

We would be happy to provide any other details or information should it be necessary. Should there be any issues with this from Shandon Golf Club's point of view, please contact us and we will do our best to respond. If however, Shandon Golf club has no issues with PPG's application for an extension to the water permit, could you sign a copy of this letter and forward it back to me.

We look forward to hearing from you.

Yours faithfully
Spencer Holmes Limited

Ian Leary
Director – Survey and Planning

The Shandon Golf Club has considered the proposed Water Permit extension by Prime Property Group and by signing indicate support for the Consent.

[redacted]
Course Superintendent, Shandon Golf Club

HUTT CITY
TE AWA KAIRANGI

14 July 2015

Ian Leary
Director - Survey and Planning
Spencer Holmes Limited
PO Box 588
Wellington 6140

Gary Craig
Strategic Services
[redacted]
Our reference: EDV1-100

Dear Ian

RE: Prime Property Resource Consent Application – Transfer of existing water permit – Extension of permit to take water.

We refer to your application to Greater Wellington Regional Council to both transfer and renew a water permit to abstract water from the Hutt River aquifer for the ex-Unilever site at 476-496 Jackson Street, Petone. This is to enable the new owner, Prime Property Group to attract new industrial/commercial tenants to the site.

Hutt City Council supports the continued use of this site for industrial/commercial activity. The city's commercial and industrial land supply is largely fixed by the extent of existing development along with our topography and territorial authority boundaries. At the time Unilever was considering the sale of this site we undertook an in-house economic assessment of various types of development on the site, including residential. This determined that the economic impact from its continued use as an industrial/commercial site provides the highest value added GDP and employment impacts for the city/region. This is based on it attracting new businesses to the site or businesses displaced by higher value activity in other parts of the city/region.

Policy 32 of the Wellington Regional Policy Statement refers to 'identifying and protecting key industrial-based employment locations'. There is limited space left to develop in Hutt City that would be appropriate for industrial uses. Given the size of the this site, its proximity to other industrial/employment sites in the Esplanade, Petone and Gracefield areas, we consider it is prudent to support continued use of the land for industrial/commercial uses and amenity, such as the water permit which support this use.

The site should also benefit from the proposed Petone to Grenada link road, which is expected to help create greater links between businesses in Hutt City and Porirua, as well as lower commuting times to allow more people to work in one city and live in another. There is potential for the link road to create additional demand for industrial/commercial land in the Petone/Esplanade area among a wide range of industries in the future.

Yours sincerely

Gary Craig
DIVISIONAL MANAGER, CITY DEVELOPMENT

8 Wellington Harbour and Hutt Valley Whaitua

Minimum flows, **minimum water levels** and allocation **limits** referred to in the Plan are interim to the extent that they will be reviewed by **whaitua** committees and may be amended by plan changes or variations following recommendations of **whaitua** committees.

8.1 Policies

The following policies apply in the Wellington Harbour and Hutt Valley Whaitua, in addition to those set out in Chapter 4 of the Plan. Policy LW.P110 is particularly relevant to the way **minimum flows or water levels** are applied and Policy LW.P113 is particularly relevant to how allocation **limits** are applied.

Policy WHW.P1: Minimum flows and water levels in the Wellington Harbour and Hutt Valley Whaitua

Minimum flows or water levels in the Wellington Harbour and Hutt Valley Whaitua are:

(a) for rivers (including **tributaries**) identified in Table 8.1, the **minimum flows** or **equivalent flows** in Table 8.1, and

(b) for rivers not in Table 8.1, 90% of the seven day **mean annual low flow**, and

(c) for **natural lakes**, existing **minimum water levels.**

Policy WHW.P2: Allocation limits for rivers and groundwater in the Wellington Harbour and Hutt Valley Whaitua

Limits for allocating water from rivers (and **tributaries**) and **groundwater** in the Wellington Harbour and Hutt Valley Whaitua are:

(a) the **limits** for **surface water allocation** in Tables 8.2 and **groundwater allocation** in Table 8.3; and

(b) for water from rivers (including **tributaries**) and **directly connected groundwater** not in tables 8.2 and 8.3:

(i) with mean flows of greater than five cubic metres per second, 50% of the **mean annual low flow**, or

(ii) with mean flows of less than or equal to five cubic metres per second, 30% of the **mean annual low flow**.

8.2 Rules

The following rules apply in the Wellington Harbour and Hutt Valley Whaitua, in addition to those set out in chapter 5 of the Plan.

Rule WHW.R1: Taking and use of water in the Wellington Harbour and Hutt Valley Whaitua – restricted discretionary activity

The take and use of water from any river (including **tributaries**) or **groundwater** in the Wellington Harbour and Hutt Valley Whaitua identified in Tables 8.2 and 8.3 is a restricted discretionary activity provided the following conditions are met:

(a) the take and use does not result in flows falling below the **minimum flows** (or **equivalent flows**) determined in Table 8.1, except that this condition does not apply to water for the **health needs of people** as part of a **group** or **community drinking water supply**, and

(b) for an existing take and use replacing or changing an **existing resource consent**, the amount of water taken and used, in addition to all **existing resource consents,** does not exceed whichever is the greater of:

  (i) the amount allocated by resource consents at the date the consent application is lodged, or

  (ii) the **limits** for **groundwater allocation** and **surface water allocation** identified for river and **groundwater management units** in Table 8.2 and 8.3, and

(c) for a new take and use, not replacing an **existing resource consent**, the amount of water taken and used, in addition to all **existing resource consents**, does not exceed the **limits** for **groundwater allocation** and **surface water allocation** identified for river and **groundwater management units** in Tables 8.2 and 8.3, except that this condition does not apply to the take and use of water at flows above the **median flow**, and

(d) at flows above **median flow**:

  (i) the frequency of **flushing flows** that exceed three times the **median flow** of the river is not changed, and

  (ii) 50% of the river flow above the **median flow** remains in the river, and

(e) the take and use is not from a river identified as outstanding in Schedule A1 (outstanding rivers) or Schedule A2 (outstanding lakes).

Matters of discretion

1. The reasonable and efficient use of water, including the criteria in Schedule R (efficient use).

2. The timing, amount (volume), and rate of taking and using water; including instantaneous (litres per second), daily (metres cubed per day), and seasonal requirements and duration and timing of peak daily take rate.

3. For **group** or **community drinking water supplies,** the amount and rate of water taken and used for the **health needs of people**.

4. Reduction in the rate of take at times of low flow and restrictions to prevent rivers falling below the **minimum flow** or **equivalent flow**, including the guideline for **stepdown allocations** and flows in Schedule T (measuring takes).

5. For a new take and use, effects due to local flow or water level depletion on **wetlands**, springs, or river reach immediately downstream, in the same **groundwater management unit** in Tables 8.2 and 8.3.

6. For a new take and use, interference effects on existing lawful water takes.

7. Prevention of salt water intrusion into the **aquifer**, or landward movement of the salt water/fresh water interface.

8. For a new take and use in **category B groundwater**, whether the water taken is from **directly connected groundwater** or **groundwater not directly connected**.

9. Preventing fish from entering water intakes.

10. Measuring and reporting, including the guideline in Schedule T (measuring takes).

Rule WHW.R2: Taking and using water – discretionary activity

The take and use of water in the Wellington Harbour and Hutt Valley Whaitua from:

(a) any river, lake (other than an outstanding lake identified in Schedule A2) or groundwater not in Table 8.2 and Table 8.3, and

(b) any river at flows above the **median flow** that does not meet condition (d) of Rule WHW.R1

is a discretionary activity.

Rule WHW.R3: Taking and use of water that exceeds minimum flows or allocation amounts – prohibited activity

The take and use of water from any river (including **tributaries**) or groundwater in the Wellington Harbour and Hutt Valley Whaitua in Tables 8.2 and 8.3 that does not meet conditions (a), (b) or (c) of Rule WHW.R1 is a prohibited activity.

Rule WHW.R4: Taking and use of water from outstanding rivers or lakes – non complying activity

The take and use of water from any river or lake in the Wellington Harbour and Hutt Valley Whaitua identified as outstanding in Schedule A1 (outstanding rivers) or Schedule A2 (outstanding lakes) is a non-complying activity.

8.3 Tables

Table 8.1: Minimum flows for rivers in the Wellington Harbour and Hutt Valley Whaitua

River	Minimum flow	
	Management point[1]	Minimum flow L/s)
Hutt River	Kaitoke water supply intake	600 [upper reach]
	Birchville recorder	1200 [middle reach]
Wainuiomata	Manuka recorder	100 [upper reach]
	Leonard Wood Park recorder	300 [middle reach]
Orongorongo River	Russ Bridge recorder	100

[1] This is the flow gauging site where the **minimum flow** policy applies (either a permanent continuous recorder or a site where spot flow gaugings can be undertaken). Where the management point is upstream of abstractions then the specified **minimum flow** is to be interpreted as the equivalent downstream flow (that is, the natural flow that occurs at any point downstream of the management point at the same time as the specified **minimum flow**)

Table 8.2: Surface water allocation limits for rivers and directly connected groundwater in the Wellington Harbour and Hutt Valley Whaitua

River and groundwater management unit	Surface water allocation limits (L/s^{-1})[2]
Hutt River and all **tributaries**, **category A groundwater**, **category B groundwater (groundwater directly connected).**	720 [upper reach]
	2115 [middle reach]
Wainuiomata River and all **tributaries**, **category A groundwater**, **category B groundwater** (**groundwater directly connected**)	55 [upper reach]
	180 [middle reach]
Orongorongo River	95

Note

The Hutt River, **Category A groundwater** and **Category B groundwater** are shown in Figure 8.1 and Figure 8.2.

2 This **limit** has been derived as a default based upon one of two rules; for rivers with a mean flow of greater than 5000 litres/sec, the **allocation limit** is equal to 50% of the natural 7-day **mean annual low flow** (7d **MALF**) and for rivers with a mean flow of less than 5000 litres/sec, the **allocation limit** is equal to 30% of the 7-day **mean annual low flow**. The 7d **MALF** has been estimated for either the bottom of the catchment or (where there is significant flow variation) or the bottom of a particular reach within a catchment. Where **allocation limits** are given for multiple reaches on the same river (eg, 'upper' and 'lower'), the downstream reach **limits** include the upstream reach **limits** (ie, are not in addition to the upstream **limit**)..

Table 8.3: Groundwater allocation limits for groundwater in the Wellington Harbour and Hutt Valley Whaitua

Groundwater management unit	Groundwater allocation limits (m^3/year)
Upper Hutt **category B groundwater** (**groundwater not directly connected**) Upper Hutt **category C groundwater**	770,000
Lower Hutt **category B groundwater** (**groundwater not directly connected**) Lower Hutt **category C groundwater**	36,500,000[1] [Waiwhetu **Aquifer** and Taita Alluvium]
	1,500,000 [Moroa **Aquifer**]

Note

Category B groundwater and **Category C groundwater** are shown in Figure 8.1 and Figure 8.2.

[1] This allocation volume includes depletion equating to 600 L/sec from the Hutt River

8.4 Figures

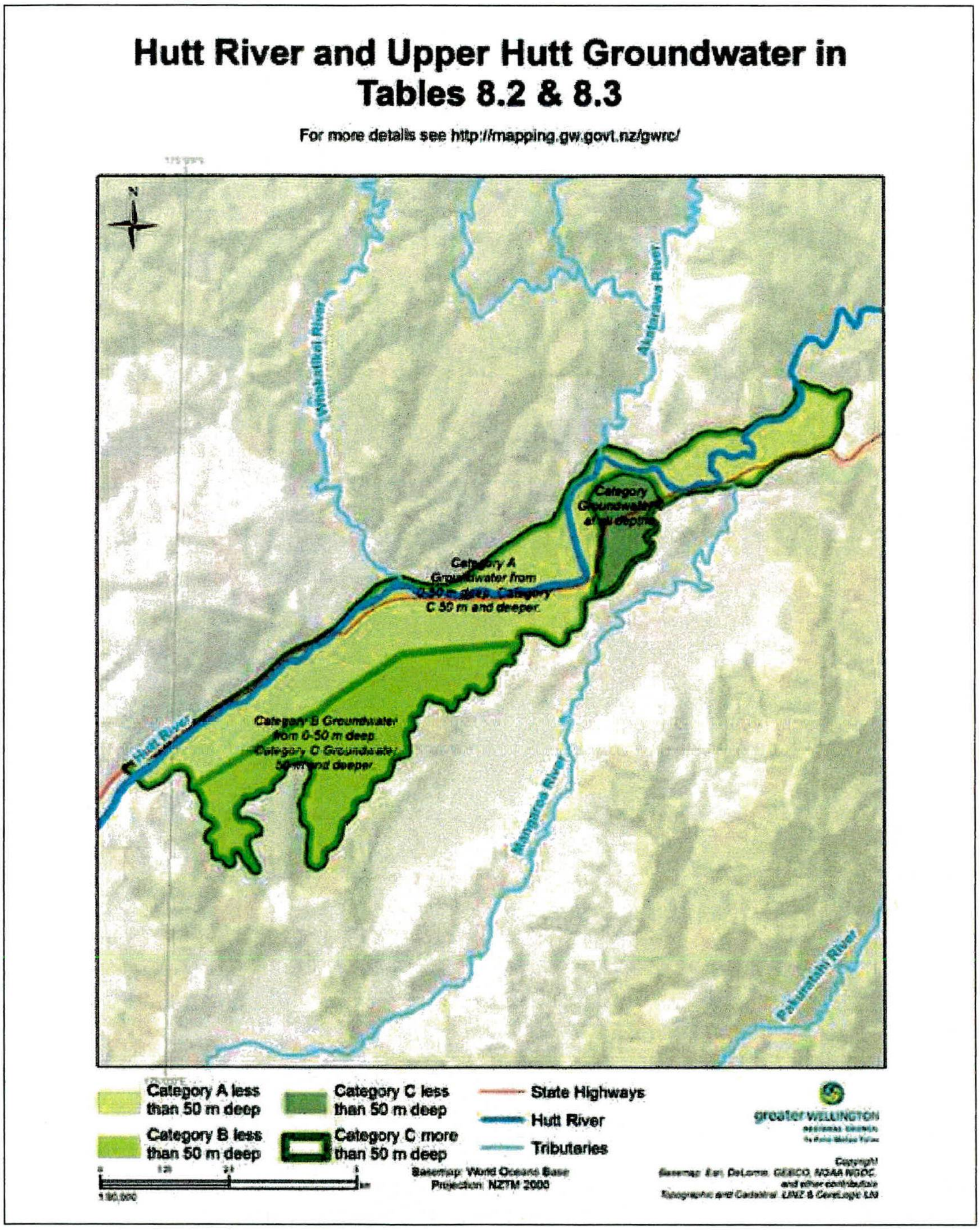

Figure 8.1: Hutt River and Upper Hutt groundwater in Table 8.2 and Table 8.3.

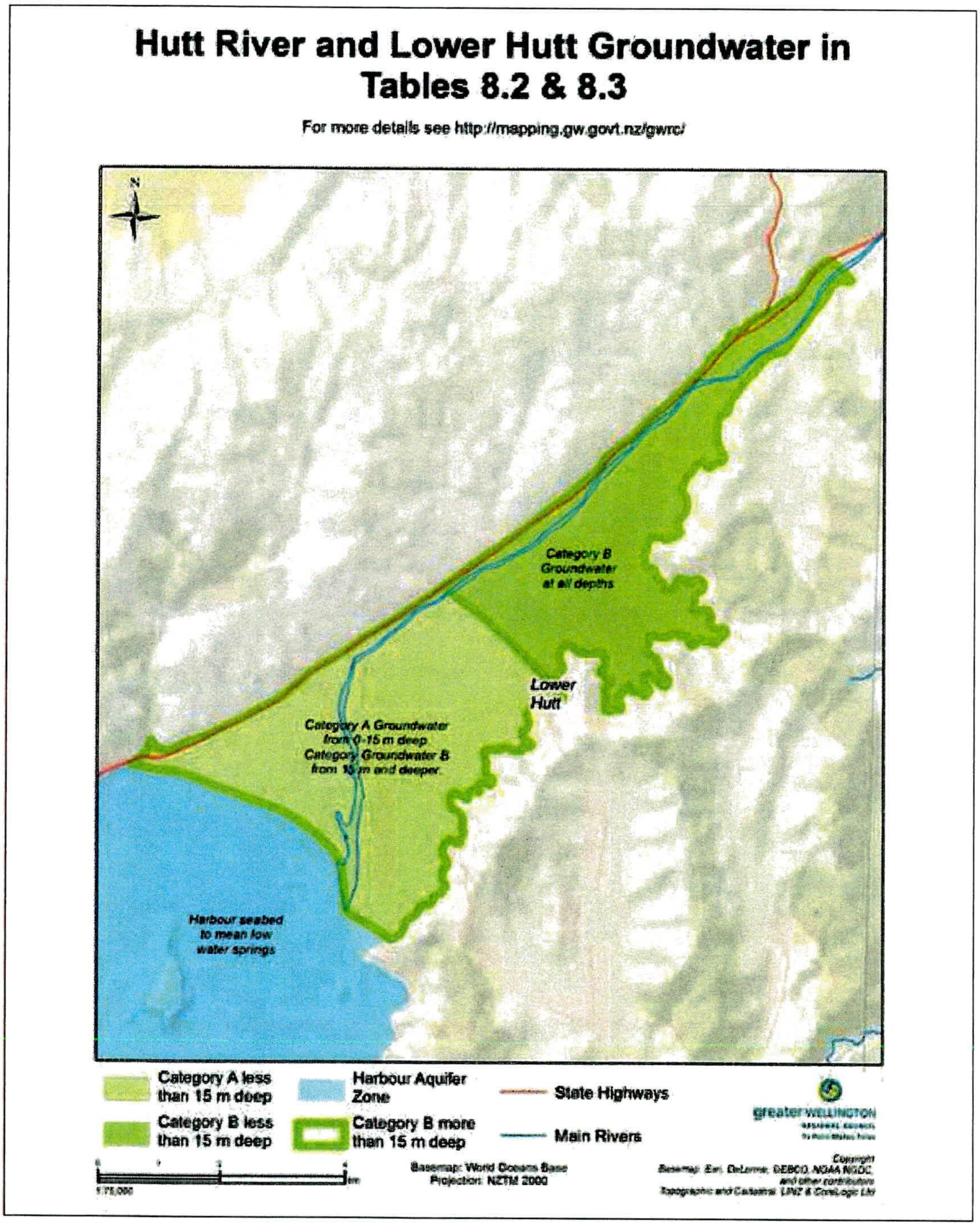

Figure 8.2: Hutt River and Lower Hutt groundwater in Table 8.2 and Table 8.3.

COPY

SpencerHolmes
engineers • surveyors • planners

Application for Renewal of a Water Permit

476-496 Jackson Street Petone

Spencer Holmes Limited
PO Box 588
WELLINGTON
Phone (04) 472 2261
Fax (04) 471 2372

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Form 1: Application for resource consent

Office use only:	
FILE REF:	
/ / /	
Doc. No.	
Referred to	Int

All sections must be completed in full and accompanied by the initial fixed application fee (see section 12) and the relevant activity form (see section 7). Failure to do so may result in your application not being accepted and/or returned. Please note that all information provided in your application is available to the public.

You can lodge your application in any of the following ways:

- **By post to PO Box 11646, Wellington or PO Box 41, Masterton**
- **In person at our Wellington office (Shed 39, 2 Fryatt Quay, Pipitea) or Masterton office (34 Chapel Street)**
- **By email to info@gw.govt.nz (a signed PDF copy is required)**

1. Applicant's details

Applicant(s) name(s) and address ie, whose name will be on the consent. Note if a private or family trust is the applicant, all the trustees are required to provide contact details and sign the application form (see 4. below)

Name: PRIME PROPERTY GROUP T: Business: 04 4991773 T: Private:

Address: P.O. Box 11785 Fax: T: Mobile:

Address: WELLINGTON Email address:

The applicant is the:

Owner ☑ Occupier ☐ Lessee ☐ Prospective Purchaser ☐ The Crown ☐

Network Utility Operator ☐ Other ☐ Please specify:

2. Agent's details

Agent's name and address Please note that all correspondence will be sent to the Agent as the first point of contact during the application process, unless instructed otherwise

Name: SPENCER HOLMES LTD T: Business: T: Private:

Address: P.O. Box 588 Fax: T: Mobile:

Address: WELLINGTON Email address: [redacted]

3. Property owner's details (if different from above)

Name: T: Business: T: Private:

Address: Fax: T: Mobile:

Address: Email address:

If your proposed activity will take place on land not owned by the applicant, the written approval of the property owner must be provided on a **completed and signed form 1B**.

4. Partnership/unincorporated entity details

For partnerships or unincorporated entities (such as private trusts or unincorporated bodies or societies) you **must** provide details of all authorised partners, trustees or members. Any consent granted will then include these names, and all individuals will be legally responsible for the consent and any associated costs. Should these persons change, then you must notify us.

Full name of person:

Status (eg, partner, trustee):

Address:

Email address: Phone:

Full name of person:

Status (eg, partner, trustee):

Address:

Email address: Phone:

Full name of person:

Status (eg, partner, trustee):

Address:

Email address: Phone:

Include details of any further partners/trustees/members on a separate page if necessary

5. Location of proposed activity

Describe the location of activity and/or property address

SEE ATTACHED APPLICATION

Map reference: NZTM:

Valuation reference [from rates]:

Include the name of any relevant stream, river or other waterbody to which the application may relate, proximity to any well known landmark, etc. (Note: a location map is required in your activity form.)

Legal description [from rates notice] [eg, Lot 9 DP58809 Block XI]

6. Description of proposed activity

SEE ATTACHED APPLICATION

7. Consents from the Greater Wellington Regional Council – activity forms you need to fill in

Consent(s) being applied for. You will need to fill in an activity form for each of the following activities: Make sure you attach the forms for your activity

Water:

- ☐ Dam/Divert (Form 2a)
- ☐ Take and use surface water (Form 2b)
- ☑ Take and use groundwater (Form 2c)

Discharge to Land:

- ☐ General discharges (Form 3a)
- ☐ Agricultural discharge (Form 3b)
- ☐ On-site wastewater (Form 3c)

Discharge to Water:

- ☐ General discharges (Form 4a)

Discharge to Air:

- ☐ Air discharge (Form 5a)

Land Use:

- ☐ General river/stream works (Form 6a)
- ☐ Bore/well construction (Form 6b)
- ☐ Bridge/culvert/pipe (Form 6c)
- ☐ Erosion protection structures (Form 6d)
- ☐ Land clearing/tracking/logging soil disturbance (Form 6e)

Coastal:

- ☐ General coastal (Form 7a)
- ☐ Boatshed (Form 7b)
- ☐ Swing mooring (Form 7c)

8. Consents from local authorities

Territorial authority in which land is situated:

- ☐ Wellington City Council
- ☑ Hutt City Council
- ☐ Upper Hutt City Council
- ☐ Porirua City Council
- ☐ Kapiti Coast District Council
- ☐ Masterton District Council
- ☐ South Wairarapa District Council
- ☐ Carterton District Council

Do you require any other resource consents from your local council? Yes ☐ No ☑

If yes, please list:

Have these consents been applied for? Yes ☐ No ☐ N/A.

9. Other documentation

Please list any documents in addition to your application forms that form part of your application. Note: if multiple other documents exist, please attach a separate sheet of paper.

☐ No other documents SEE ATTACHED APPLICATION

☐ Reports Title

☐ Plans Title

☐ Other documents Title

Title

10. Pre-application advice

Please list any pre-application meetings or advice (verbal and/or written) you have had with GWRC below:

☑ Meeting(s) – with who and when? KIRSTY VAN REENAN / JEREMY RUSBATCH MARCH / APRIL 2015

☐ Verbal advice – from who and when?

☐ Written advice – from who and when?

☐ Other (eg, submitted draft application/AEE)

11. Consultation and written approval of affected persons

Consultation with all persons potentially affected by your activity prior to lodging your application may result in considerable time and cost savings.

Non-notified applications

Non-notified consents are for activities which have minor effects on the environment. For your activity to be considered on a non-notified basis you must consult and obtain written approval from all persons potentially affected by your activity (eg, neighbours, iwi, Fish and Game Council, Department of Conservation). If you are unsure who may be an affected party, please call us. ***Non-notified consents are significantly cheaper and quicker to process.***

Limited notified and fully notified applications

Notified consents (either limited notified or fully notified consents) are for activities which do not meet requirements in the RMA for processing on a non-notified basis.

Please provide any consultation details and written approvals obtained in the space provided below.

Consultation details

Have you consulted with iwi? Yes ☑ No ☐

If so, who did you consult? WELLINGTON TENTHS TRUST & NGATI TOA

Who else have you consulted? SHANDON GOLF CLUB, HUTT CITY COUNCIL

What was their response? NO RESPONSE FROM ALL PARTIES EXCEPT HCC WHO HAVE PROVIDED SUPPORT LETTER

How have you addressed any concerns they may have had?

Written approval of affected parties

If you have obtained the signature of affected persons please give their details below. Please note that for us to accept the approvals **they must each complete and sign form 1B**.

Name	Address	Contact details (phone, email etc)

12. Fees and charges

Non-notified initial fixed application fees including GST (please tick one or more)

Discharge permit	☐ Land	☐ Water (other)	☐ Air
	$ 991.88	$1,520.88	$1,058.00
Water permit	☐ Take (new)	☑ Take (renewal)	☐ Dam/Divert
	$1,587.00	$ 925.75	$ 727.38
Land use consent	☐ Bore	☐ River works	☐ Land clearing/disturbance/logging
	$ 376.63	$ 727.38	$1,256.38
Coastal permit	☐ Mooring	☐ Boatshed	☐ Other
	$ 529.00	$ 529.00	$ 859.63

Notes:
1. Where there is more than one application required for the same proposal, an initial fixed application fee is required for each application
2. The initial fixed application fee is the average cost of processing an application type. Final processing costs are based on actual and reasonable time and disbursements spent processing your application.
3. Contact the Greater Wellington Regional Council for information about notified initial fixed application fees

Payment method (please tick one)

☑ Cheque (to be lodged with application documents)

☐ Internet banking to:

Greater Wellington Regional Council – National Bank account 06-0582-0104781-00

Date of payment: ____________ Reference details used: ____________

Note: for reference details please quote "Consents" and the applicant name

☐ Cash/Eftpos (to be made at Environment Help Desk Wgtn or Masterton office)

Future payments

Any additional consent processing charges and consent monitoring charges will be invoiced directly to the applicant, unless instructed otherwise below:

13. Applicant's declaration

I/we hereby certify that, to the best of my/our knowledge and belief, the information given in this application is true and correct.

I/we understand that the Council may charge me/us for all costs actually and reasonably incurred in processing this application and, if granted, for any subsequent monitoring charges. Subject to my/our rights under sections 357B and 358 of the RMA to object to any costs, I/we undertake to pay all and future processing costs and monitoring costs incurred by the Council. Without limiting the Council's legal rights, if any steps, including the use of debt collectors, are necessary to recover unpaid costs, I/we agree to pay all costs associated with recovering those costs. If this application is made on behalf of a trust (private or family), a society (incorporated or unincorporated) or a company in signing this application I/we are binding the trust, society or company to pay all the above costs and guaranteeing to pay all the above costs in my/our personal capacity.

Full name: IAN THOMAS LEARY Date: 8/07/2015

Applicant's signature: Leary

(or person authorised to sign on behalf of the applicant)

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

2c Water permit application to take and use groundwater

Please answer all questions fully. Officers from the Greater Wellington Regional Council's (GWRC) Environmental Regulation department are available to assist with filling out this form or to clarify information to include with your application.

This form is required to be filled out in conjunction with Form 1 Resource Consent Application

---

Part A: General information on nature and scale of your activity

1. **Is this application a renewal of a water permit to take/use groundwater from your bore/well?**

   Yes ☑ No ☐ If Yes, what is the water permit number? ~~WAR~~/WGN 070193 [25890]

2. **What is the land use consent (bore permit) number for the bore/well where water will be taken from?**

   WGN/WAR UNKNOWN (EXISTING)

   Note: All bores/wells are required to have a land use consent (bore permit). If a permit for your bore/well has not been obtained you will need to apply for a land use consent (bore permit) as well. Use application form 9.

3. **Locality map**

   Show the location of your proposed abstraction point on an appropriately scaled aerial map/plan. Please show the area to be irrigated (if applicable), the location of any buildings, septic tanks, location of any neighbouring bores/wells, other known abstraction points, freshwater springs, streams, rivers, wetlands that you know of and any other relevant features of the surrounding environment.

4. **What is the bore/well number for the bore/well where ground water will be taken from?**

   UNKNOWN (eg, S26/0727)

5. **What will be the maximum rate at which water is taken?**

   29 litres per second

   24 hours per day

   925,600 m^3 per year

Note: (1) For **water permits for irrigation use**, the annual quantity will be allocated based on the outcome of an irrigation allocation report. Please include this report with your application. GWRC can provide you with a SPASMO-IR allocation assessment report. Please contact us if you would like us to provide you with an allocation assessment report.

(2) If you require more water than the allocation report suggests you will need to provide adequate justification for the amount of groundwater required in question 7 below.

(3) A year is measured from 1 July to 30 June inclusive.

6. **What will groundwater be used for?** [Tick the appropriate box(es)]

- ☑ Industry — State type of industry and major use of water: ______
- ☐ Community — State no. of households or population: ______
- ☐ Other — State use: ______
- ☐ Irrigation — State method of irrigation ☐ spray ☐ trickle ☐ border-dyke ☐ other

If spray irrigation, what method of spray irrigation will be used?

☐ centre pivot ☐ travelling irrigator ☐ K line or Bosch sprinklers ☐ other

What is the total area will you be irrigating?

☐ Crop(s) ______ ha Crop type: ______

☐ Pasture ______ ha

☐ Horticulture ______ ha Horticulture type: ______

☐ Other ______ ha Please specify: ______

(Please show clearly the area to be irrigated on a scaled aerial map.)

Please describe the soil type and characteristics for the area to be irrigated below:

______

7. **Please justify the amount of groundwater requested in question 5 above (eg, please provide any usage records/calculations/design relating to the proposed groundwater take). Use a separate sheet if required.**

SEE ATTACHED REPORT

8. **Is there a water meter installed on the pump?** Yes ☑ No ☐

If Yes, please answer questions 7A to 7D below

If No, when do you plan to install a water meter? ______

A. What is the water meter type? ☐ Magflow ☐ Ultrasonic ☐ Mechanical ☐ Other: UNKNOWN

B. What is the water meter serial number and brand type? ______

C. Has the water meter being verified? Yes ☐ No ☐

If Yes, who verified the water meter and when? UNKNOWN

D. What is the distance between the water meter and the abstraction/pumping location? ______ metres

Note: Under the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010, approval is required from GWRC if your water meter is located more than 20 metres from the abstraction point.

E. If the distance identified in D above is greater than 20 metres, please explain why your water meter is located where it is, and mark specifically where your water meter is located in question 9 below:

9. **What is the pump make, type and model?** SEE AEE

Is the pump ☐ submersible or ☐ surface/suction lift? (please tick one)

What is the maximum capacity of your pump? ______ litres per second

Part B: Assessment of effects on the environment (AEE)

Where your take could have a significant adverse effect on the environment a more detailed environmental assessment is required in accordance with the Fourth Schedule of the Resource Management Act 1991. This will be the case for most new applications and replacement or variation applications where more water is required. As part of this assessment an aquifer test (pump test) will be required to be done on your bore/well and analysis presented in order to answer the questions detailed below. (Further information on aquifer (pump) tests can be gained from our Environmental Science department)

1. **Has an aquifer test (pump test) been carried out on your bore/well?** Yes ☐ No ☑

(Please provide a copy of your aquifer test or summary details of your aquifer test in the space provided below eg, length of test, pumping rate, drawdown in pumped bore, drawdown in monitored bores, assessment of aquifer transmissivity and storage co-efficient)

2. **Please show any of the following on your scaled aerial map**

(1) Other bores/wells

(2) All springs and surface waterbodies (including wetlands)

(3) Any septic tanks and/or other waste disposal areas

3. **What are the anticipated effects of your proposed groundwater take on nearby bores/wells?**

SEE AEE

4. **What are the anticipated effects of your proposed groundwater take on any springs or surface water bodies (including wetlands)?**

SEE AEE

5. **What are the anticipated effects of your proposed groundwater take on features within the surrounding environment (eg, stands of native vegetation, waste disposal areas etc.)?**

SEE AEE

6. **Is your proposed groundwater take within 1 kilometre of any coastline?** ☑ Yes ☐ No

If Yes, what are the anticipated effects of your proposed groundwater take on the risk of saltwater intrusion?

SEE AEE

7. **Are there any alternative water sources available to you?** Yes ☐ No ☑

If yes, please explain why you have chosen this option and not alternative options:

SEE AEE

Part C: Monitoring and management of your activity

1. **What monitoring and management do you propose to ensure any potential adverse effects on the environment are avoided, remedied or mitigated?**

   (This may include, but is not limited to, what abstraction data you plan to record, when information will be submitted to GWRC, any groundwater levels that may be taken in your or any other bore/well, any monitoring of surface water bodies including wetlands that may be undertaken)

   SEE AEE

2. **If you are required to submit water use records, how will you submit any records to GWRC?**

   ☑ Electronically via a third party data host provider. State your provider: ____________

   There are a number of companies that host water use data. By ticking this box you agree for that data provider to automatically submit water use records to GWRC's water use data management system. If you do not agree to the data provider submitting water use records, please explain why below:

   ☐ Electronically via GWRC's WATER USE website (http://wateruse.gw.govt.nz/)

   ☐ Other: ____________

   If water use records are submitted in a manner that requires entry of individual records into GWRC's water use data management system by GWRC staff, this will incur higher compliance monitoring charges.

3. **What measures will you take during times of water shortage (eg, periods of low flow) if your groundwater take is likely to affect a surface water body?**

   SEE RECOMMENDED CONDITIONS

   Note: Some of the Wellington region's stream and river flows are monitored by GWRC. Any low flow restrictions placed on a particular stream or river can be viewed on our website www.gw.govt.nz.

4. **Do you have internet access and are prepared to monitor low flows via GWRC's website?*** Yes ☑ No ☐

   Do you have email access and are prepared to receive email notices of low river flows?*

   Email: ____________ Yes ☑ No ☐

   Do you have cell phone text access and are prepared to receive text notices of low river flows?* Yes ☑ No ☐

   Cell phone number: SUBJECT TO APPROVAL Yes ☐ No ☐

   *Note: This is only possible for rivers and streams monitored by GWRC.