

Irrigation Water
Monitoring Programme
Annual Report
2021-2022

Technical Report 2022-95



Working with people | caring for Taranaki

Taranaki Regional Council
Private Bag 713
Stratford

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Executive summary

This report for the period July 2021 to June 2022 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the environmental and consent compliance performance of irrigation consent holders across the Taranaki region. The assessment covers resource consents held for pastoral, horticultural and golf course irrigation. This is the 19th Annual Report issued by the Council to report on compliance monitoring programmes for consents authorising the abstraction of freshwater for irrigation purposes in Taranaki.

During the monitoring period, the irrigation consent holders demonstrated a high level of environmental performance and high level of administrative performance.

At 30 June 2022, a total of 66 resource consents to take and use freshwater for irrigation purposes were registered in the Council's database. Of these, 48 were for pasture irrigation, 8 for horticultural activities and 10 for recreational purposes (golf clubs). Fifty-three of these consents authorised abstraction of surface water (80%) and 13 from groundwater sources (20%).

The Council's monitoring of irrigation water permits comprises a range of components including site inspections, the collection and assessment of abstraction data, residual flow monitoring, water quality analysis, data review and compliance assessments. The specific range of monitoring carried out for each consent is dictated by the water source, weather and flow conditions, and system design.

A total of 52 irrigation consents were exercised during the 2021-2022 monitoring year, with south Taranaki commencing irrigation in November and the rest of the region beginning in January. Irrigation concluded late April through to early May across the region. Rainfall recorded at the Council's monitoring locations over the summer irrigation period ranged between 82% and 203% of historical mean values. Even though rainfall volumes were higher than previous years, the irrigation season was longer with total irrigation water usage of 6,960 ML during the 2021-2022 season. This was higher than the preceding 2020-2021 monitoring year, which recorded 5,567 ML.

The Council carried out compliance monitoring inspections at all active irrigation sites during 2021-2022 period. Compliance with residual flow conditions for surface water abstractions was assessed by the Council on 32 separate occasions, across 19 waterways. Consent holder performance for the year was assessed on compliance with their authorised abstraction rates/volumes, maintenance of minimum residual flows, provision of abstraction records and all other general conditions of their consent(s).

Monitoring found the majority of takes being well managed and operating within relevant consent conditions during the 2021-2022 period. The Council was required to enter three incidents in relation to irrigation consents over this period, with all non-compliances deemed sufficiently minor not to warrant further action from Council. The overall rate of non-compliance across all exercised consents was 5%, which was the same as that seen during the 2020-2021 period.

During the 2021-2022 year, 96% of exercised irrigation consents in Taranaki achieved a high level of environmental performance and compliance with their consents, while 4% are required to improve their compliance performance.

For reference, in the 2021-2022 year, consent holders were found to achieve a high level of environmental performance and compliance for 88% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 10% of the consents, a good level of environmental performance and compliance was achieved.

In terms of overall environmental and compliance performance by the irrigation water consent holder's over the last several years, this report shows that the consent holder performance is remains at a high level in the year under review.

This report includes recommendations for the 2022-2023 year.

Table of contents

	Page	
1	Introduction	1
1.1	Compliance monitoring programme reports and the Resource Management Act 1991	1
1.1.1	Introduction	1
1.1.2	Structure of this report	1
1.1.3	The Resource Management Act 1991 and monitoring	1
1.1.4	Evaluation of environmental and administrative performance	2
1.1.5	Regional freshwater allocation	2
1.1.6	Irrigation zones	4
1.1.7	Irrigation systems	5
1.1.8	Environmental effects of exercising water permits	6
1.2	Climatological data and irrigation requirements	7
1.3	Monitoring Programme	10
1.3.1	Introduction	10
1.3.2	Programme liaison and management	10
1.3.3	Site inspections	11
1.3.4	Measuring and reporting of water takes	11
1.3.5	Residual flow monitoring	13
1.3.6	Data review and compliance assessment	13
2	Results	14
2.1	Site inspections	14
2.2	Residual flow compliance	14
2.3	Water usage and compliance assessment	14
2.4	Groundwater quality results	15
2.5	Incidents, investigations, and interventions	15
3	Discussion	17
3.1	Discussion of site performance	17
3.2	Evaluation of performance	18
3.3	Recommendations from the 2020-2021 Annual Report	20
3.4	Alterations to monitoring programmes for 2022-2023	20
4	Recommendations	22
	Glossary of common terms and abbreviations	23
	Bibliography and references	24

Appendix I	Example surface water abstraction permit for irrigation	
Appendix II	Categories used to evaluate environmental and administrative performance	
Appendix III	Active irrigation consents in Taranaki July 2021 to June 2022	
Appendix IV	Water take consent usage for 2021-2022	
Appendix V	Report on consented water permits for farm and general water supply purposes 2021-2022	

List of tables

Table 1	Total rainfall from 1 November 2021 to 30 April 2022 versus historical values	8
Table 2	Groundwater quality results	15
Table 3	Incidents, investigations, and interventions summary table	16
Table 4	Individual performance for all irrigation consent holders	18

List of figures

Figure 1	Percentage of water irrigation allocation per activity in the Taranaki region	3
Figure 2	Source of water for irrigation in Taranaki during the 2021-2022 period	3
Figure 3	Total consented water abstractions – distributed by activity 2021-2022	3
Figure 4	Pasture irrigation zones and locations of consented irrigation in Taranaki	4
Figure 5	Distribution map of the total rainfall recorded from 1 November 2021 to 30 April 2022	9

List of photos

Photo 1	Mosaic of pictures depicting k-line long lateral type irrigation	5
Photo 2	Picture depicting centre pivot	5
Photo 3	Picture depicting travelling irrigator system	6
Photo 4	An example of a good flowmeter installation	13
Photo 5	An example of a poor flowmeter installation	13

1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is for the period July 2021 to June 2022 by the Taranaki Regional Council (the Council) describing the monitoring programmes for resource consents authorising the abstraction of freshwater for irrigation purposes in Taranaki.

This report covers the data collected for compliance monitoring for resource consents for pastoral, horticultural and golf course irrigation. This report discusses the environmental effects of the Consent holder's use of water, and is the 19th combined annual report by the Council for the Irrigation water.

1.1.2 Structure of this report

Section 1 of this report is a background section. It sets out general information about:

- consent compliance monitoring under the *Resource Management Act 1991* (RMA) and the Council's obligations;
- the Council's approach to monitoring sites through annual programmes;
- the resource consents held for water takes across various catchments;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted in the Company's site/catchment.

Section 2 presents the results of monitoring during the period under review, including scientific and technical data.

Section 3 discusses the results, their interpretations, and their significance for the environment.

Section 4 presents recommendations to be implemented in the 2021-2022 monitoring year.

A glossary of common abbreviations and scientific terms, and a bibliography, are presented at the end of the report.

1.1.3 The Resource Management Act 1991 and monitoring

The RMA primarily addresses environmental 'effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

- a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;
- b. physical effects on the locality, including landscape, amenity and visual effects;
- c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;
- d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and
- e. risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of 'effects' in as much as is appropriate for each activity. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the RMA to assess the effects of the exercise of consents. In accordance with Section 35 of

the RMA, the Council undertakes compliance monitoring for consents and rules in regional plans, and maintains an overview of the performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continually re-evaluate its approach and that of consent holders to resource management and, ultimately, through the refinement of methods and considered responsible resource utilisation, to move closer to achieving sustainable development of the region's resources.

1.1.4 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by the consent holders, this report also assigns a rating as to each Company's environmental and administrative performance during the period under review. The rating categories are high, good, improvement required and poor for both environmental and administrative performance. The interpretations for these ratings are found in Appendix II.

For reference, in the 2021-2022 year, consent holders were found to achieve a high level of environmental performance and compliance for 88% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 10% of the consents, a good level of environmental performance and compliance was achieved.¹

1.1.5 Regional freshwater allocation

At 30 June 2022, there were a total of 66 resource consents to take and use freshwater for irrigation purposes in Taranaki. Forty-eight consents were for pasture irrigation, eight for irrigation associated with horticultural activities and ten for recreational purposes (e.g. golf course watering) (Figure 1).

Surface water is the predominant source of water for irrigation, accounting for 53 of the 66 consented water abstractions (80%). The remaining 13 consents (20%) authorise abstractions from groundwater (Figure 2).

The relatively low yields from Taranaki's aquifers are rarely sufficient to supply an entire irrigation system, and hence groundwater usage as a primary source of irrigation water is uncommon across the region. Typically, groundwater abstractions are used to supplement surface water irrigation supply.

The breakdown of freshwater allocation in the region indicates that pasture irrigation represents 25% of the total consented water abstraction in Taranaki. Other types of irrigation (horticultural and recreational) account for approximately 9%, with other uses² accounting for the majority (66%) of the total water allocation across the region (Figure 3).

¹ The Council has used these compliance grading criteria for more than 18 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

² Includes: Aquaculture, Building Construction/Drainage/Flood Control, Chemical Processing/Manufacturing, Dairy Farm, Dairy Processing/Manufacturing, Dry Stock Farm, Hydrocarbon Exploration/Service Facilities, Landfills, Local Authorities, Meat and By-Product Processing, Petrochemical Processing, Piggery Farms, Poultry Farms, Power Generation – HydroPower Generation & Thermal, Quarries, Recreation/Tourism/Cultural, Road/Bridge Construction or Maintenance, Sewage Treatment, Swimming Pools, Timber Treatment or Sawmills, Water Supply or Treatment.

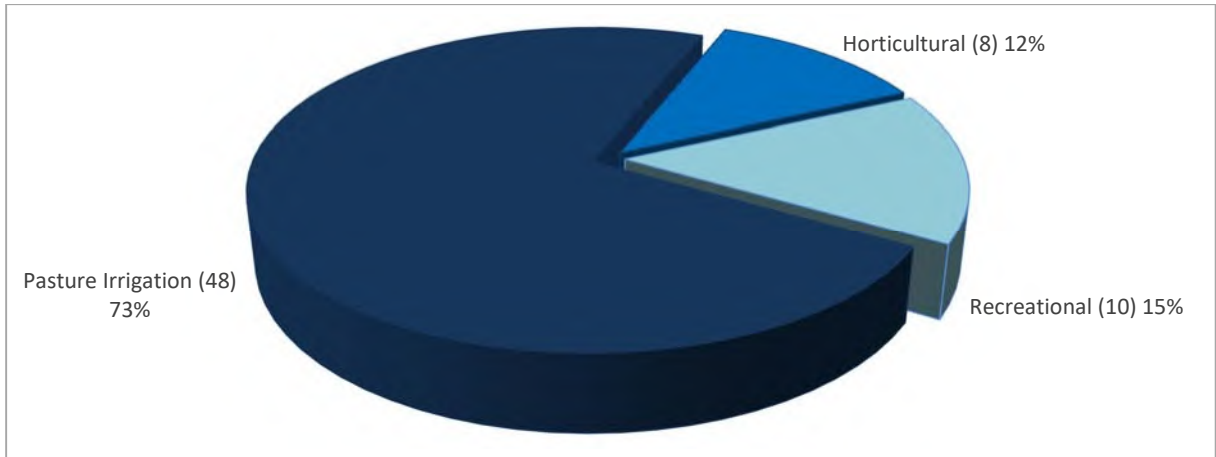


Figure 1 Percentage of water irrigation allocation per activity in the Taranaki region

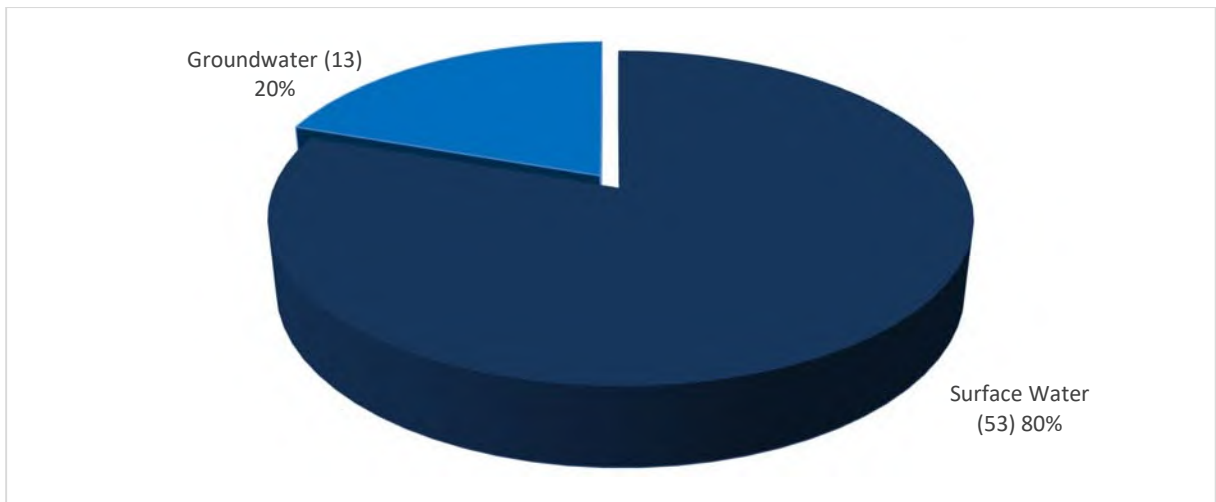


Figure 2 Source of water for irrigation in Taranaki during the 2021-2022 period

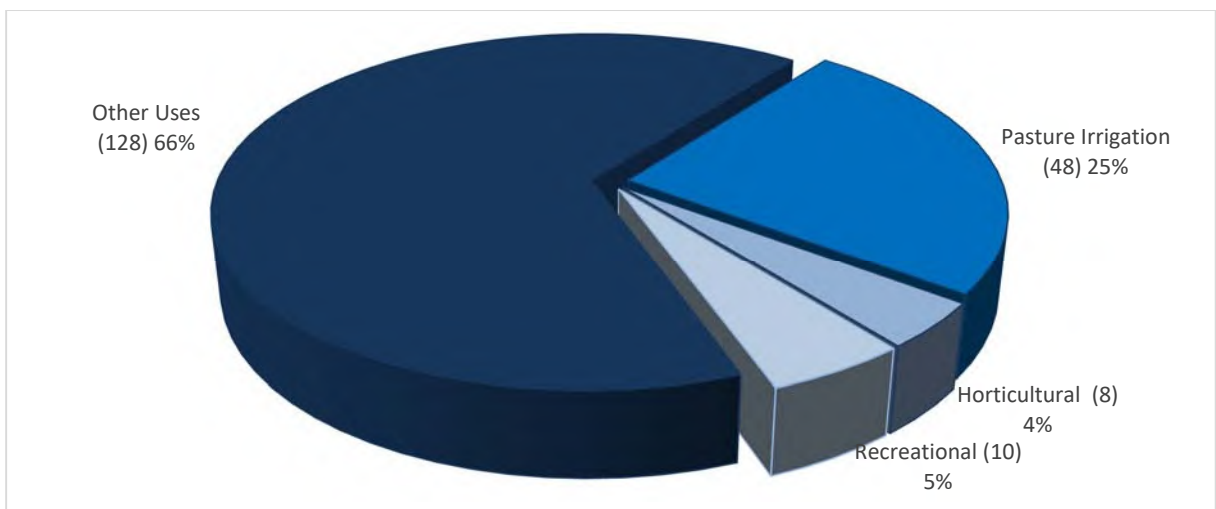


Figure 3 Total consented water abstractions – distributed by activity 2021-2022

1.1.6 Irrigation zones

A regional study commissioned for the Council in 2002 (Rout, 2003) identified eight irrigation zones based mainly on climate. The developed potential in each zone was assessed as was the potential cost/benefit of irrigation development in each. Each zone, and the location of all current irrigation consents are illustrated in Figure 4.

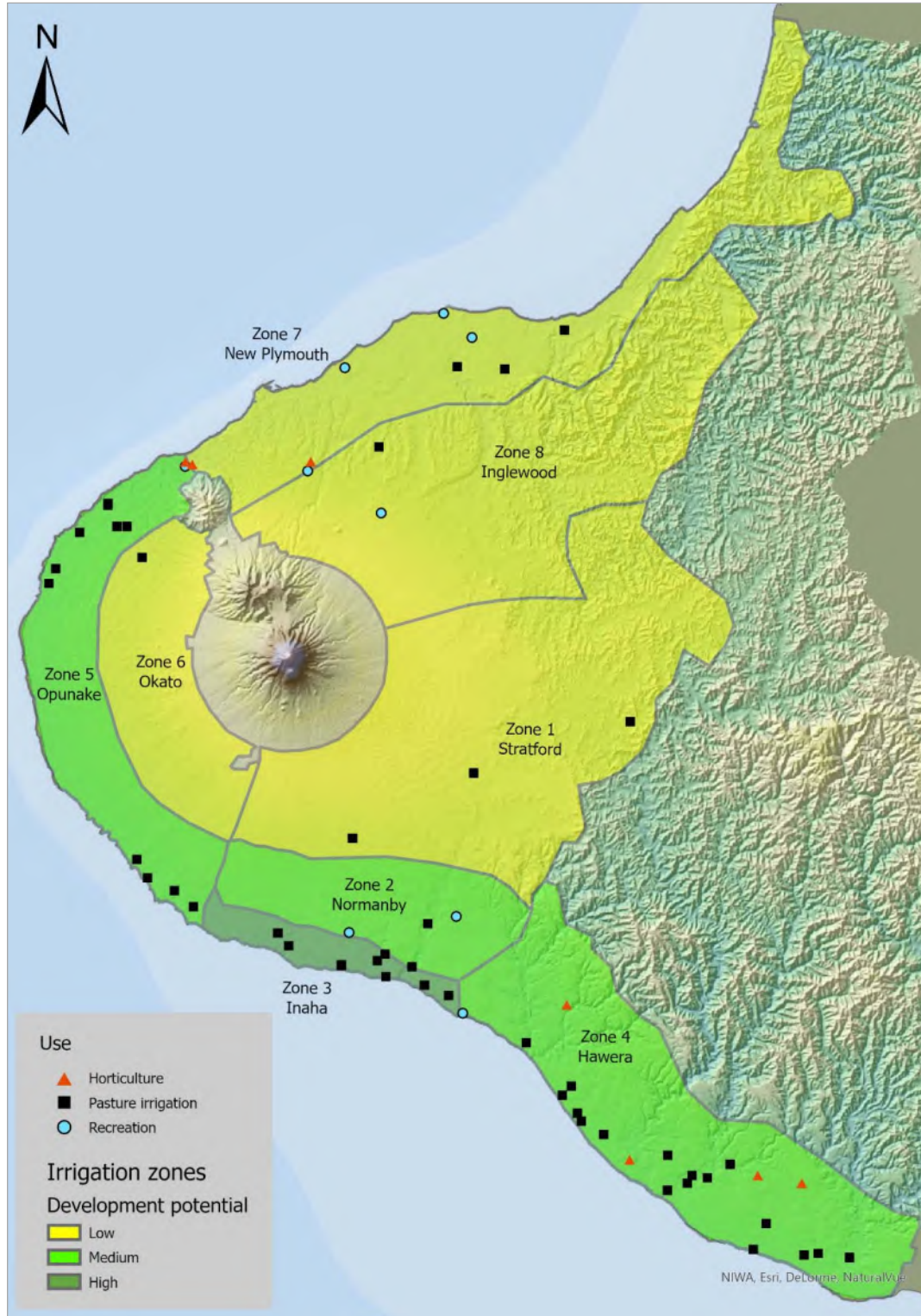


Figure 4 Pasture irrigation zones and locations of consented irrigation in Taranaki

The modelling exercise identified zones with the most potential for pasture irrigation requirements were Normanby (*Zone 2*), Inaha (*Zone 3*), Hawera (*Zone 4*) and Opunake (*Zone 5*). As illustrated in Figure 4, the vast majority of pasture irrigation in Taranaki does take place within Zones 2, 3, 4 and 5, which represents a 10 km wide belt of coastal land stretching from Oakura to Waitotara.

1.1.7 Irrigation systems

In general there are two types of irrigation methods; surface and pressurised. The majority of irrigation systems currently in operation in the region fall in to the pressurised category. Pressurised systems can be further differentiated based on the method of operation and equipment used. A summary of the systems encountered in the region is given below.

K-line and long-lateral types – Impact sprinklers mounted on moveable laterals (Photo 1)

These are the most common systems found in the region, as they are a low cost option and are relatively easy to operate. They can easily be adapted to fit in with existing farm layouts and are especially suitable for windy conditions. However, these systems are labour intensive, as they need to be moved manually on a regular basis.



Photo 1 Mosaic of pictures depicting k-line long lateral type irrigation

Centre pivot type – spray mounted on a movable lateral (Photo 2)

Centre pivot type systems are automatically controlled, so have a low labour input. They are low maintenance and have versatility in application rates and are desirable on steep, rocky or uneven soils. However, they are a high capital cost option and can be expensive to run due to electricity costs.



Photo 2 Picture depicting centre pivot

Travelling irrigators-spray nozzles mounted on fixed or rotating boom (*rotary boom, fixed boom, gun irrigator, effluent irrigator*) (Photo 3)

Travelling irrigators are a low capital cost option, and are simple to operate. They can cover a large irrigation area and there is some control over the application rate. However, these systems do not perform well in windy conditions, and tend to apply uneven amounts of water, especially at the end of a run.

The predominant irrigation system used in Taranaki is the K-line, accounting for 52% of all systems in use. A further 17% of irrigation consent holders operate solely with centre pivots, 8% operate travelling irrigators, while 20% utilise more than one type of system. The remaining 5% of consent holders are yet to install irrigation infrastructure.



Photo 3 Picture depicting travelling irrigator system

Appendix III lists the type of system operated by each consent holder.

1.1.8 Environmental effects of exercising water permits

Environmental effects of water abstraction can include a loss of aquatic habitat and biodiversity, and impacts on cultural, recreational and aesthetic values of waterbodies. In an effort to reduce such impacts, the Council encourages the efficient use of water through technical irrigation system design, and maintenance and management practices that help achieve high irrigation efficiencies.

Surface water bodies

Expected periods of peak irrigation water demand normally coincide with periods of low flows in rivers and streams. During these periods, the Council closely monitors river flows and the exercising of water permits.

The majority of surface water permits for irrigation require the abstraction to cease when the flow in the river providing water for irrigation reaches, or falls below, a specified level (minimum/residual flow). Policy 6.1.5 of the Regional Freshwater Plan for Taranaki states that at least two-thirds of habitat within a river or stream is to be retained at mean annual low flow (MALF) levels. This figure has been derived for protection of habitat requirements for brown trout, and is considered conservative for native species.

For many smaller waterways, two-thirds habitat roughly equates to two-thirds MALF, however, the cut-off flow level on many irrigation abstraction consents is in practice generally set at MALF. It is the responsibility of the consent holder to ensure compliance with consent conditions at all times.

In certain coastal streams, and under certain flow conditions, tidal movements can result in the migration of saline water upstream from the coastal margin. The abstraction and application of saline or brackish water to land can have adverse effects on pumping and irrigation equipment, crops and soils.

Groundwater abstractions

The abstraction of groundwater for use in irrigation supply has the potential to lower groundwater levels in the vicinity of the pumping bore. The potential effects of any groundwater abstraction are assessed by the Council during the processing of a resource consent application for a groundwater take. The potential

impact of any new take on existing groundwater users and ecological receptors form a major component of this assessment.

Groundwater levels in coastal bores should generally be maintained above mean sea level to avoid the risk of sea water intrusion into the freshwater aquifers. Increased salinity in previously fresh groundwater can result in significant ecological effects, adversely impact existing users of groundwater and limit its potential future use.

Fortunately in Taranaki, the risk of saltwater intrusion is low due to the limited number of high yielding coastal bores. As part of irrigation monitoring programmes, the Council monitors water quality indicators at five coastal sites in order to assess any changes in groundwater composition as a result of abstraction.

Nutrient loading

Irrigated pasture typically supports higher stock numbers compared with non-irrigated pasture and consequently a higher nutrient (nitrate) loading per hectare. This is particularly the case in areas where the underlying soils are free-draining. Irrigation schemes in Zones 2, 3 and 4 occur in areas where groundwater is known to be at risk of nitrate contamination given the drainage characteristics of soils in those zones (TRC 1998, 2005). Careful management of irrigation water and fertiliser application regimes is therefore required to minimise the risk of groundwater and surface water contamination under irrigated conditions.

1.2 Climatological data and irrigation requirements

The Council provides live on-site data on soil moisture, rainfall and temperature via its website. Eight sites along the coastline provide climatological information about the most intensively developed irrigation zones.

Irrigation for Taranaki dairy farms usually occurs over a three to six month period depending on location and climatic conditions. For the majority of consent holders irrigation for the 2021-2022 season commenced in November for south Taranaki and January for the rest of the region, but temporarily ceased in February, as two extreme rainfall events occurred on 5 and 6 February and 12 and 13 February. Rainfall totals for February were between 178% and 702% of normal, with an average of 354%. Irrigation resumed again at the start of March and continued until late April and into early May. Rainfall from Taranaki Maunga was 107-123% of normal for the period. As shown in Table 1, for the period 1 November 2021 to 30 April 2022, the majority of sites received above normal rainfall by between 100% and 203%, except for the northern hill country rainfall sites which recorded below normal by between 82% and 98%. Extreme rainfall events throughout February resulted in rainfall totals higher than normal for the period. Rainfall gradients across the region are illustrated in Figure 5.

Rainfall has a direct impact not only on river and stream flows but also on the amount of water recharging the region's aquifers, which also contribute baseflow to surface water systems. Rainfall recharge is critical to maintain groundwater levels and thus the potential to supply water in the zones where there is more pressure on surface water resources.

Accurate interpretation of climatological data is important for the planning, scheduling and operation of efficient irrigation systems. Precipitation and evapotranspiration data are fundamental to carrying out reliable water budget calculations and calculations of crop (pasture) water requirements. Crop water requirements can be defined as the depth of water needed to offset the loss of water through evapotranspiration. In other words, for any period of time, the net irrigation requirement is the amount of water which is not effectively provided for by rainfall.

The calculated amounts of irrigation water to be efficiently applied to pasture, should also account for the water that is lost while transporting it from its source to the pasture root zone. Some of the losses that need to be estimated are those which occur due to leakage from pipelines and evaporation from droplets

sprayed through the air. To compensate for these losses, additional water must be pumped than is required to be stored in the pasture root zone. Therefore, the gross irrigation requirement is the total amount that must be pumped which takes into consideration the irrigation efficiency.

Table 1 Total rainfall from 1 November 2021 to 30 April 2022 versus historical values

Site	Total rainfall 1 November 2021 to 30 April 2022 (mm)	Mean rainfall November to April (mm)	November 2021 to April 2022 rainfall as a proportion of mean values
North Egmont	2959.0	2411.2	123%
Dawson Falls	2835.5	2364.5	120%
Kahui Hut	2235.0	1539.9	107%
Hillsborough	984.5	770.3	128%
Brooklands Zoo	854.2	703.5	121%
Mangati	827.0	657.0	126%
Motunui	754.8	664.5	114%
Egmont Village	1392.0	1048.6	133%
Everett Park	998.0	899.7	111%
Inglewood	1188.0	991.8	120%
Stratford	1016.5	756.0	134%
Mangaehu	920.0	664.0	139%
Kotare	745.0	908.2	82%
Kaka Rd (Uruti)	969.0	988.7	98%
Pohokura Saddle	844.0	848.1	100%
Stony (Okato)	1255.0	865.2	145%
Kapoaiaia (Cape Egmont)	1223.0	602.7	203%
Taungatara (Te Kiri)	1024.5	660.4	155%
Kaupokonui (Manaia)	785.5	495.8	158%
Duffys (Whareroa)	780.5	496.2	157%
Patea	844.2	520.4	162%
Charlies	776.5	725.0	107%
Moana Trig	841.0	599.5	140%
Rimunui Stn (Waitotara)	734.0	582.0	126%
Ngutuwaera	683.5	558.9	122%
Waitotara Coast	627.6	522.6	120%

The third variable that should be accounted for when planning and operating irrigation systems is soil moisture. Some of the water that is required by the pasture may already be held in the soil, so it is critical to quantify it. There is no extra value in applying more water than the soil can hold, this only results in unnecessary costs and wastage. The only reliable way of knowing how much irrigated water can be stored in the soil at the time of irrigation is by measuring soil moisture.

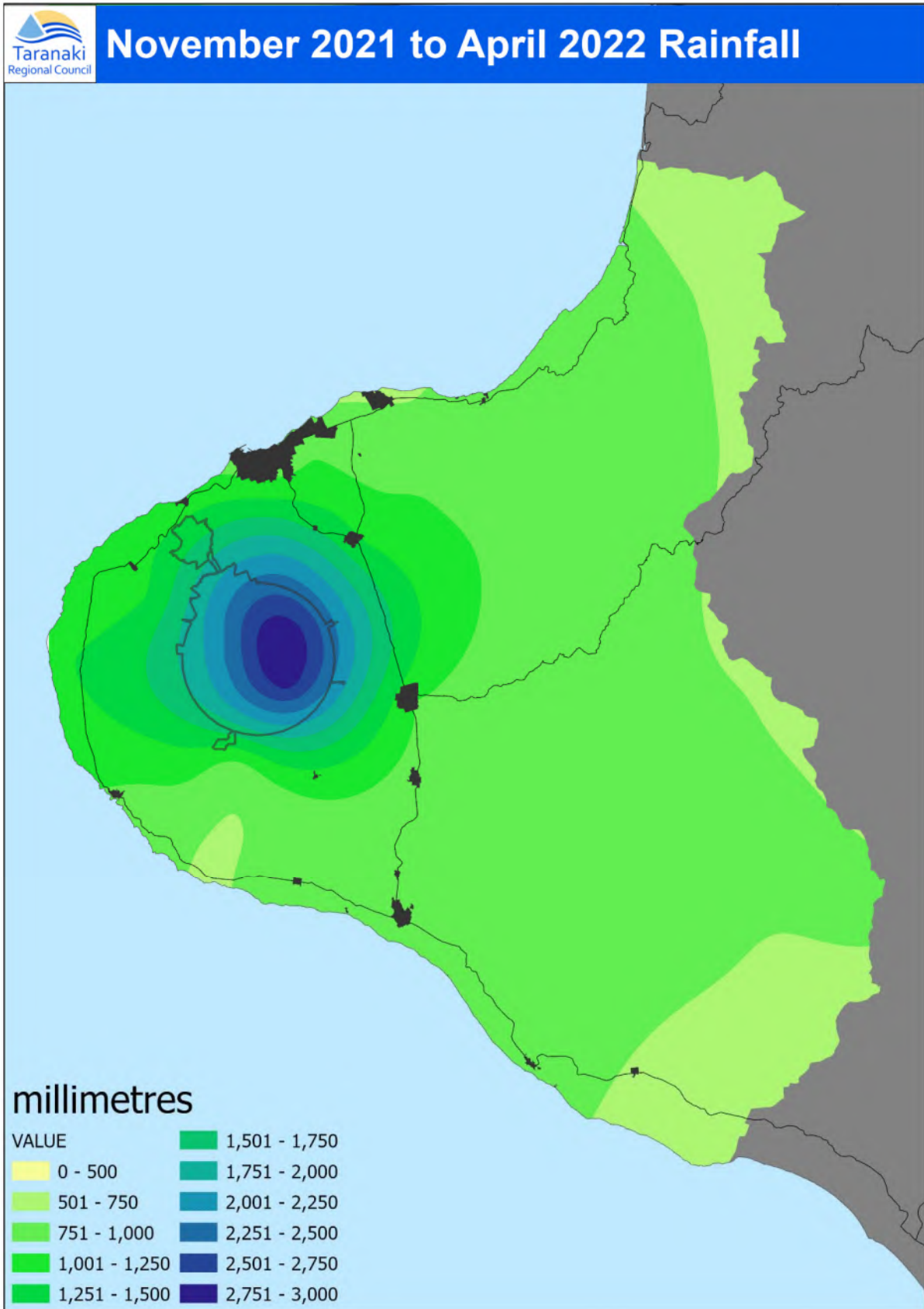


Figure 5 Distribution map of the total rainfall recorded from 1 November 2021 to 30 April 2022

By measuring the soil moisture the irrigator can be more certain that:

- only the amount of water required by the plant is applied;
- leaching of nutrients is minimised;
- pasture growth and quality is maximised;
- the environmental impacts of irrigation are minimised; and
- costs are reduced.

In order to maximise the efficient use of water taken, the Council strongly urges irrigators to monitor and plan irrigation with the factors outlined above in mind. Precision irrigation will also assist irrigators in achieving greater economic benefits from water taken.

1.3 Monitoring Programme

1.3.1 Introduction

Section 35 of the RMA sets obligations upon the Council to gather information, monitor and conduct research on the exercise of resource consents within the Taranaki region. The Council is also required to assess the effects arising from the exercising of these consents and report upon them.

The Council may therefore make and record measurements of physical and chemical parameters, take samples for analysis, carry out surveys and inspections, conduct investigations and seek information from consent holders.

Every year the Council undertakes monitoring programmes for all pasture irrigation water permits. The programmes list all of the work that the Council could undertake during the forthcoming monitoring period and the cost of the activities to the consent holder. Because irrigation is climate dependent, the level of monitoring varies from year to year, as do associated costs. Increased monitoring is generally required during drier years. Automated monitoring systems can reduce ongoing monitoring costs for consent holders.

The 2021-2022 monitoring programmes for irrigation water permits comprised a range of various components, including liaison with consent holders, site inspections, water take data collection, residual flow monitoring, water quality analysis, data review and compliance assessments. The specific range of monitoring carried out in relation to each consent is dictated by the water source, weather and flow conditions and system design. Irrigation began in November for south Taranaki farmers and January for the rest of the region. Systems were turned off at the start of February due to significant rainfall, but soils dried up quickly and irrigation re-commenced in early March and continued through to late April to early May. A summary of the various monitoring programme components are set out in Sections 1.3.2 to 1.3.6.

1.3.2 Programme liaison and management

There is generally a significant investment of time and resources by the Council in:

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;
- discussion over monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

1.3.3 Site inspections

The 2021-2022 pasture irrigation monitoring programme provided for an annual inspection of each pasture irrigation abstraction site to assess/evaluate compliance with consent conditions. Council staff were able to visit 100% of the active consents during the 2021-2022 monitoring period. Additionally, activities comprising of golf clubs, horticultural irrigation schemes and stock and dairy shed takes were also subject to a planned inspection visit.

Site inspections are focused on assessing the overall set-up of the intake structures, a visual inspection and assessment of screenings, fences, staff gauges, flowmeters, datalogger devices and planting of riparian vegetation, in line with consent conditions.

The annual inspections occur between May and July each year, once the irrigation season has ended. The timing of inspections means that a full seasons irrigation records can be downloaded from the datalogging devices during inspections, resulting in time and cost efficiencies. It also means however that most irrigation systems have been decommissioned for the season or undergoing maintenance, so it is sometimes difficult for staff to assess compliance with all consent conditions, particularly those relating to application efficiency and water loss across the operable system. Consent holders that breached their consent conditions in the previous monitoring period also receive an additional mid-season inspection to ensure compliance is continuing.

Monitoring of surface water abstractions also includes checking compliance with the residual flow conditions of the consent. Residual flow conditions set minimum environmental flows to be maintained during pumping in the waterways downstream from the abstraction point. Compliance with the residual flow conditions is assessed through hydrological flow gauging's which are carried out during low flow conditions in summer. The results of residual flow monitoring are summarised in Section 2.2.

1.3.4 Measuring and reporting of water takes

A special condition of all irrigation water abstractions is the requirement for the consent holder to measure and record abstraction data. The information collected contributes to the sustainable management of the resource and allows for assessment of compliance with consent conditions. The information is also useful for consent holders in managing inputs to their operations, identifying potential energy savings, operational issues and making water use efficiency gains³.

The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 (the Regulations) place further legislative requirement on holders of consents for water abstraction greater than 5 L/s, unless the taking of water is for non-consumptive purposes.

The Regulations require:

- all water permits allowing the taking of 5L/s or more to collect and report records to a set minimum requirement⁴;
- measurement at the point of where the water is taken from the river, lake or groundwater system (unless otherwise approved by the Council to be in another location);
- continuous records of daily volumes to be collected using an appropriate flowmeter with the data transferred to the Council on at least an annual basis;
- the flowmeter to meet an accuracy standard (\pm 5%), and should be properly installed and calibrated independently every five years; and

³ Sustainable Water Programme of Action, Ministry for the Environment.

⁴ Refer to the document Resource Management (Measuring and reporting of Water Takes) Regulations 2010. REF 2010/267.

- the consent holder is to be responsible for recording and transferring the data to the Council.

All abstractions captured under the Regulations were required to be compliant by 10 November 2016. The Council retains the authority to apply more stringent requirements on consent holders over and above those set out in the Regulations through the setting of consent conditions.

The rates and volumes of water abstraction are measured using a flowmeter. If a flowmeter is installed outside of the manufacturer's specifications, large errors may occur. The error produced by a valve installed immediately upstream of the flowmeter can be as much as 50%. Errors produced by sharp bends upstream of the flowmeter can amount to 20% of the measured flow. Photo 4 shows an example of a good installation of a flowmeter, with appropriate lengths of straight pipe either side of the meter. Photo 5 shows an example of a poor installation, with an elbow in the pipework immediately downstream of the flowmeter.

Poorly installed flowmeters are unlikely to pass the verification test required by a resource consent and/or the Regulations. In these instances the consent holder will be required to undertake works to allow for the successful verification of the flowmeter.

Presently the Council receives a mixture of manual and electronic records of water use data each year. The majority of consent holders use a datalogger to electronically store all take data being measured by the flowmeter. Data stored on a datalogger is downloaded in the field by Council staff during end of year inspection visits, or earlier if deemed necessary. Some datalogging systems also utilise telemetry to transmit data to the Council in near real-time. Telemetered systems have clear benefits for both consent compliance and water use assessment by consent holders. Records are required to cover the entire water year (1 July to 30 June) and must be provided to the Council by 31 July of each year.

On 3 August 2020, the government gazetted the Resource Management (Measurement and Reporting of Water Takes) Amendment Regulations 2020⁵. The amended Regulations came in to force on 3 September 2020. Most significantly, the amended Regulations require consent holders to record measurements of the water taken under a water permit in each 15-minute period, instead of each day. The permit holder must also provide the Council with daily records of the measurements by the end of the next day (or later in certain circumstances) electronically. In effect, the amended Regulations mandate the use of telemetry systems for all takes exceeding 5 L/s.

The new requirements start applying to a water permit only a number of years after these regulations commence, depending on the rate at which water may be taken under the permit, as follows:

- 2 years after if the rate is ≥ 20 litres/second (i.e. September 2022);
- 4 years after if the rate is ≥ 10 but < 20 litres/second (i.e. September 2024);
- 6 years after if the rate is ≥ 5 but < 10 litres/second (i.e. September 2026).

The Council is working closely with the consent holders to ensure compliance by the set date based on their abstraction rates. Information has been sent out to all water permit holders and service providers regarding the new requirements and have been provided general information on telemetry systems and operation.

As of 1 July 2022, 84% of irrigation water takes that are consented to take ≥ 20 L/s were sending data through the Council's telemetry network. While 57% for takes between 10 L/s and 20 L/s and 40% between 5 L/s to 10 L/s.

As a region 87% of all water takes ≥ 20 L/s were sending data through the telemetry network. While 54% for takes between 10 L/s and 20 L/s and 50% for takes between 5 L/s and 10 L/s.

⁵ Refer to the document Resource Management (Measuring and reporting of Water Takes) Amendment Regulations 2020. REF 2020/176.

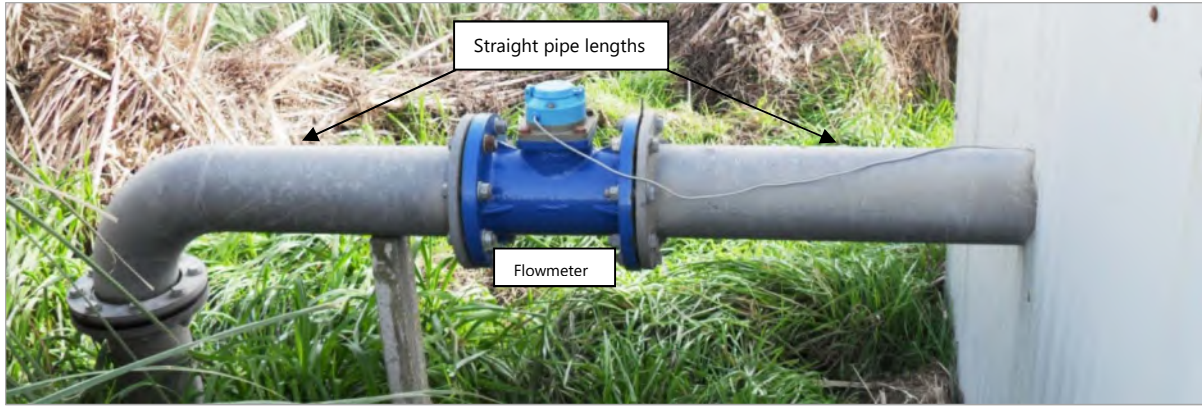


Photo 4 An example of a good flowmeter installation

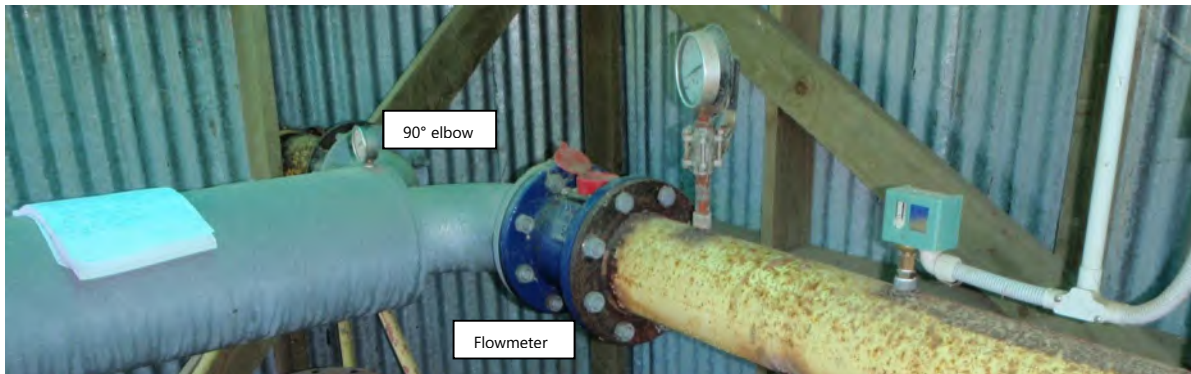


Photo 5 An example of a poor flowmeter installation

1.3.5 Residual flow monitoring

Compliance with consent conditions requires water to only be taken when there is water available above the minimum flow limit set out in the consent. If flows drop below this level, then irrigation is to cease until such a time that flows increase above the minimum flow limit. To determine compliance with these consent conditions the Council undertakes stream flow measurements by indirect and direct methods at control points usually upstream and/or downstream of abstraction points. These methods involve the measurements of velocity and cross-sectional areas which are used together to determine the flow rate at the time of the assessment.

1.3.6 Data review and compliance assessment

A major component of the monitoring programme is the assessment of water take data for consent compliance purposes. Compliance with abstraction rate and volume is assessed for all consent holders that exercised their consent. Compliance with abstraction rate and/or volume limits stipulated in the applicable resource consent was determined by assessment of remotely recorded data, or by calculating from records submitted by the consent holder. Data transferred to the Council by telemetered systems is electronically assessed on receipt, with pre-set automated alarms activated in the event of any consent limit exceedances.

2 Results

2.1 Site inspections

The Council carried out annual compliance monitoring inspections at all sites where irrigation consents were exercised during the 2021-2022 irrigation season.

Inspections found the majority of takes being well managed and operated within relevant consent conditions. Three non-compliances were identified during inspection visits, which are discussed further in Section 2.5.

2.2 Residual flow compliance

During the period under review, compliance with residual flow conditions for surface water abstraction sites was assessed 32 times in 19 waterways.

Stream gaugings were generally targeted to coincide with the periods of low surface water flows. Of the 32 gaugings carried out, no measured flows were below residual flow limits as set by consent conditions. Many irrigators use the Council's website to monitor the river flows via the environmental data page to ensure they maintain compliance.

2.3 Water usage and compliance assessment

A total of 52 irrigation consents were exercised during the 2021-2022 monitoring year, with irrigation commencing in November for South Taranaki farmers and January for the rest of the region and concluding for most by end of April. Total water use across all exercised irrigation consents was 6,960 ML. This was more than that used during the preceding 2020-2021 monitoring year, when 56 irrigation consents were exercised, and a total usage of 5,567 ML.

The highest water usage for the season was by Spenceview Farms, abstracting 867,306 m³. This consent took an average of 82 L/s, with irrigation occurring from November to mid-May. The second highest water user was Roger Dickie Family Trust with 725,928 m³. Both Spenceview Farms and Roger Dickie Family Trust use large volumes of water, as they operate centre pivots to irrigate large areas of their farmland. Both consent holders operated within the conditions of their respective consents for the duration of the monitoring period. The average usage across all irrigation takes for the 2021-2022 year was 100,876 m³.

The majority of the consent holders who exercised their consents during the 2021-2022 period and were required to submit records, either by their consent conditions or the Regulations, did so within the required timeframe. Written notifications and telephone calls received advising the non-exercising of consents were also taken as provision of records.

Appendix IV lists each consent holder's 2021-2022 water usage for comparison against their maximum authorised take volume over the monitoring period. The average annual consented take volume across all irrigation consents is 1049 ML. In contrast to this figure, the actual average annual usage for the 2021-2022 season was 105 ML, which is only 10% of the total allowable take volume. Actual usage figures are significantly less than the volume allocated through consents given that consents are only exercised for a small portion of the year, as demand only spikes during dry periods. Also, the majority of the consent holders tend to not irrigate on a continual basis, but generally irrigate at night to minimise evaporation losses and capitalise on reduced electricity supply costs. Peak irrigation demand does generally coincide with periods of reduced flow in the region's rivers and streams, which means there is a reduced volume of water available for abstraction.

All data collected is assessed for compliance against respective consent conditions. Following the assessment of the 2021-2022 data, three incidents were lodged in relation to irrigation consent non-

compliances. Details relating to each non-compliance and the follow-up actions undertaken by the Council are presented in Section 2.5.

2.4 Groundwater quality results

During the period under review, groundwater samples were obtained from a total of seven coastal sites to assess salinity levels in aquifers being pumped. The results indicate groundwater salinities in the range expected in coastal areas. The measured values during the 2021-2022 monitoring period show little deviation from historical mean values at each site.

The results of the sampling carried out are presented below in Table 2. Historical means for each analyte are presented in brackets for comparison.

Table 2 Groundwater quality results

Consent	Site code	Sample date	Chloride (g/m ³)	Conductivity (µS/cm)	pH	Sodium (g/m ³)	Number of samples on record
5950-2	GND1203	23/03/2022	31.0 (33.8)	36.5 (33.5)	8.2 (8.5)	60.0 (59.8)	11
	GND1711	23/03/2022	31.0 (36.0)	36.3 (35.0)	8.0 (8.5)	61.0 (60.0)	3
6026-1	GND1233	23/03/2022	24.0 (45.2)	36.0 (46.2)	8.1 (7.8)	37.0 (40.3)	9
9561-1	GND2108	16/03/2022	47.0 (45.2)	42.0 (41.5)	8.3 (8.2)	26.0 (25.9)	6
9608-1	GND2355	16/03/2022	70.0 (84.7)	73.2 (75.0)	8.9 (8.7)	169.0 (184.0)	7
10767-1	GND3015	16/03/2022	36.0 (34.5)	42.8 (43.2)	8.2 (8.2)	41.0 (41.5)	2
10916-1	GND3106	16/03/2022	24.0 (-)	26.7 (-)	8.0 (-)	35.0 (-)	1

2.5 Incidents, investigations, and interventions

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the consent holders. During the year matters may arise which require additional activity by the Council, for example provision of advice and information, or investigation of potential or actual causes of non-compliance or failure to maintain good practices. A pro-active approach, that in the first instance avoids issues occurring, is favoured.

For all significant compliance issues, as well as complaints from the public, the Council maintains a database record. The record includes events where the individual/organisation concerned has itself notified the Council. Details of any investigation and corrective action taken are recorded for non-compliant events.

Complaints may be alleged to be associated with a particular site. If there is potentially an issue of legal liability, the Council must be able to prove by investigation that the identified individual/organisation is indeed the source of the incident (or that the allegation cannot be proven).

Table 3 below sets out details of any incidents recorded, additional investigations, or interventions required by the Council in relation to the consent holder's activities during the 2021-2022 period. This table presents details of all events that required further investigation or intervention regardless of whether these were found to be compliant or not.

Following investigation of all registered incidents, all of the non-compliances were deemed sufficiently minor not to warrant further action from the Council, over and above a formal warning regarding their future conduct. Overall, the non-compliance rate across all active irrigation consents in 2021-2022 was 5%, which was the same as 2020-2021 monitoring year.

Table 3 Incidents, investigations, and interventions summary table

Date	Consent Holder (Consent number)	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
13/07/2022	Kaitake Golf Club Inc	Abstraction volume had been exceeded on numerous occasions between 10 November 2021 and 9 March 2022.	N	14 day letter	Letter of explanation received and Council accepted.
27/07/2022	Roger Dickie Family Trust	During routine monitoring it was found that there was no power to the shed and no data could be downloaded	N	14 day letter	Letter of explanation received. Power restored, so logger could be downloaded. Data processed and was compliant.
03/08/2022	Manukorihi Golf Club Inc	Abstraction volume and rate breaches throughout the monitoring year	N	14 day letter	Letter of explanation received and Council accepted.

3 Discussion

3.1 Discussion of site performance

Given that this report jointly covers 66 different irrigation water take consents at numerous locations across the region, a discussion of system performance at each location is impractical. However overall, the examination of the data supplied to the Council for the 2021-2022 monitoring year revealed that three of the 52 consent holders (6%) who exercised their consents breached one or more conditions of their resource consent. Two of these breaches related to exceedances of consented abstraction rate and/or volume, while one due to lack of provision of data.

Discussed below are some of the key points and issues arising from the monitoring of irrigation water takes during the 2021-2022 monitoring year. Also discussed are some components of irrigation system monitoring, data collection and transfer that could assist consent holders in improving compliance performance and optimisation of their water usage.

The primary means of measuring water abstraction data is the flowmeter. In order to comply with monitoring requirements set out in consent conditions, and the requirements set out in relation to meter accuracy in the Regulations, it is critical that flowmeters are installed as per manufacturer's specifications. Consent holders must ensure the meter is operable at all times, even when no water is being taken. Consent holders should not tamper with the operation of the meter, or attempt to access internals of the meter, without advising the Council and engaging a suitably qualified technician. Further information regarding preferred meter specification and operation can be obtained by contacting the Council.

To ensure data being collected by a flowmeter is accurate; the accuracy of a flowmeter needs to be confirmed by a verification test. A meter is deemed to be recording accurately (verified) when reading within +/- 5% of a calibrated reference meter. The Regulations required all takes over 5 L/s to be verified by 10 November 2016. Resource consents being issued by the Council generally require flowmeters to be verified before the consent is first exercised. The correct installation of a good quality flowmeter will typically ensure a meter is able to pass a verification test. While 100% of active consents that required their meters to be verified in Taranaki have been verified, the Council has had to pursue enforcement action in a small number of instances to ensure compliance. Re-verification of a meter is required every five years, and plans should be put in place well in advance of re-verification dates to avoid any compliance issues.

At the conclusion of the monitoring period, it was found during the annual inspection, that a small number of consent holders had operational issues with measurement and recording equipment during the year. Consent holders are reminded that they need to contact the Council as soon as they discover any operational issues with any monitoring equipment or operational issues that impact their ability to comply with their consent (e.g. burst pipework). The majority of irrigation consents stipulate a requirement to notify the Council of such issues in any case, and failure to do so may result in enforcement action being taken.

As discussed previously in this report, the majority of irrigation consent holders record water take data on dataloggers, which is automatically transmitted to the Council and is viewed real time by Council staff. Automated alarms are set up to notify staff and the consent holder of any breaches of authorised rate or volume. However, there are still a small number which are downloaded by Council staff at the conclusion of the monitoring year, at which point it is assessed for compliance. During the investigation and follow-up of non-compliances identified at the conclusion of the 2021-2022 monitoring year, consent holders identified as non-compliant installed equipment to transmit the data directly to Council. The amended Regulations, which came in to force on 3rd September 2020, require consent holders that take above 20 L/s to record and transmit their data in real time by September 2022. This will improve consent compliance and allow water users to better monitor their water usage and improve water use efficiency.

Irrigation consent holders are also urged to investigate the use of soil moisture monitoring equipment to assist in the efficient planning and scheduling of irrigation. By monitoring soil moisture conditions, irrigators can optimise the usage of their irrigation systems to only apply water to pasture when it is required and to cease irrigation when the optimum volume of water has been applied. This has obvious benefits in terms of both maximising pasture production and the efficiency of water usage. These benefits can also result in cost savings by avoiding water being applied when it is not required. Soil moisture monitoring can be undertaken with handheld sensors, or with dedicated in-situ systems. The complexity and cost of each available system vary and consent holders can contact the Council for further information.

3.2 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 4.

Table 4 Individual performance for all irrigation consent holders

Consent	Consent Holder	Environmental compliance achieved?	Administration compliance achieved?
0017-3.1	Manaia Golf Club	High	High
0124-5	Kaitake Golf Club Inc	Improvement required	High
0132-3	Hawera Golf Club Inc	High	High
0189-4	AI & KJ Williams	n/a	n/a
0270-3	Westown Golf Club Incorporated	High	High
0278-4	Oceanview Trust	n/a	n/a
0464-3	Oakura Farms Limited	n/a	n/a
0714-2	GD & HM McCallum	n/a	n/a
0721-3	Go 2 Milk Limited	High	High
0880-3	IHC New Zealand Inc	High	Good
1223-3	EO & CP Lander	High	High
1721-3.1	Manukorihi Golf Club Inc	Improvement required	High
1877-3	Te Ngutu Golf Club Incorporated	High	High
2138-3	Riverside Farms Taranaki Limited	High	High
3312-3.1	The Tom Lance Trust	High	High
4450-2.1	Waitara Golf Club Inc	High	High
4494-3	Friesianroots Limited	High	High
4783-3	Larsen Trusts Partnership	n/a	n/a
4993-2	J & EG Sanderson	High	High
4994-2	J & EG Sanderson	High	High
5128-3	Coastal Country Farms Limited	n/a	n/a
5570-3	Kaihihi Trust	High	High
5571-2	Jimian Limited	n/a	n/a
5623-2.1	WD & SC Morrison	High	High
5636-2	Waiwira Trust	High	High

Consent	Consent Holder	Environmental compliance achieved?	Administration compliance achieved?
5773-2	Goodin FJ & Sons Limited	High	High
5778-2	Mara Trust	High	High
5781-2.1	Waikaikai Farms Limited	High	High
5791-2	AL & LA Campbell	High	High
5797-2	Pihama Farms Limited	n/a	n/a
5807-2	Roger Dickie Family Trust	High	Good
5827-2	Walker & McLean Partnership	High	High
5829-2	RM & MC Julian Family Trust	High	High
5840-2	Gibbs G Trust	High	High
5863-2.1	AR Geary Trust	High	High
5876-2	GA & RJ Dorn	n/a	n/a
5878-2.1	Woollaston Family Trust Partnership	High	Good
5879-2	BR & RG Harvey Family Trust	High	High
5887-2	BLL Farm Trust	High	High
5896-2	Kohi Investments Limited	High	High
5898-2	David Pease Family Trust	High	High
5950-2.1	WD & SC Morrison	High	High
6026-1	JR & DM Baker	High	High
6159-1	Waireka Trust	n/a	n/a
6292-2	New Plymouth Golf Club Inc	High	High
6429-1	Leatherleaf Limited	High	Good
6430-1	Fonic Farms Limited	n/a	n/a
6628-1.1	JW & MT Hamblyn Family Trusts	High	High
7346-1.1	Spenceview Farms	High	High
7372-1	Pukeone Partnership	High	High
7470-2.1	Taranaki Thoroughbred Racing	High	High
7527-1.1	Pukeone Partnership	High	High
7528-1.1	Kereone Farms Limited	High	High
7626-1	NW & DM King	High	High
7768-1	Carter AJ Limited	n/a	n/a
7781-1	D Krumm	n/a	n/a
7895-1	Ohawe Farms Limited	High	High
9561-1	Kereone Farms Limited	High	High
9577-1.1	Bucman Trust	High	High
9597-1	Nilock & Camole Trusts	High	High

Consent	Consent Holder	Environmental compliance achieved?	Administration compliance achieved?
9608-1.2	DR Wilson	High	High
10135-1.1	Luttrell Trust Partnership	High	High
10369-1	Inglewood Golf Club Inc	High	High
10767-1	Alexander Farms Limited	High	High
10903-1	Summerset Villaes	High	High
10916-1	Waitotara Kiwifruit Limited Partnership	n/a	n/a

n/a = not applicable, as consent was not exercised during the period under review, so no rating assigned.

During the year, 96% of exercised irrigation water consents demonstrated a high level of environmental performance and 92% demonstrated a high level of administrative performance with the resource consents as defined in Appendix II. A further 4% are required to show improvement in environmental performance while 8% showed good level of administrative performance.

3.3 Recommendations from the 2020-2021 Annual Report

In the 2020-2021 Annual Report, it was recommended:

1. THAT in the first instance, monitoring and reporting of consented irrigation activities for the 2021-2022 year continue at the same level as in 2020-2021.
2. THAT should there be issues with environmental or administrative performance in 2021-2022, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the monitoring and the downloading of abstraction data occurs mid-season for those that had water takes breaches during the 2019-2020 and 2020-2021 seasons.
4. THAT the Council will support and provide advice to consent holders to ensure that telemetry is in place by the dates set out by the Resource Management (Measuring and Reporting Water Takes) Amendment Regulations 2020.

Recommendations 1, 2 and 3 were implemented during the period under review. With the amendment to the Regulations 2020, Council will continue to work with consent holders in regards to recommendation 4 which has now mandated the installation of telemetry systems for specified takes.

3.4 Alterations to monitoring programmes for 2022-2023

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- reporting to the regional community.

The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki exercising resource consents.

It is proposed that for 2022-2023 that monitoring of irrigation consents continues at the same levels as during the 2021-2022 year.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site(s) in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2022-2023.

4 Recommendations

1. THAT in the first instance, monitoring and reporting of consented irrigation activities for the 2022-2023 year continue at the same level as in 2021-2022.
2. THAT should there be issues with environmental or administrative performance in 2022-2023, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the monitoring and the downloading of abstraction data occurs mid-season for those that had water takes breaches during the 2020-2021 and 2021-2022 seasons.
4. THAT the Council will support and provide advice to consent holders to ensure that telemetry is in place by the dates set out by the Resource Management (Measuring and Reporting Water Takes) Amendment Regulations 2020.

Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in $\mu\text{S}/\text{cm}$.
Cumec	A volumetric measure of flow- 1 cubic metre per second ($1 \text{ m}^3\text{s}^{-1}$).
g/m^3	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
Incident register	The incident register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
L/s	Litres per second.
ML	Million litres
$\mu\text{S}/\text{cm}$	Microsiemens per centimetre.
pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	<i>Resource Management Act 1991</i> and including all subsequent amendments.
Temp	Temperature, measured in °C (degrees Celsius).

For further information on analytical methods, contact an Environment Quality Manager.

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Appendix I

Example surface water abstraction permit for irrigation

Water Permit
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder: Waitotara Kiwifruit Limited Partnership
93 First Avenue
Tauranga 3110

Decision Date 29 March 2021

Commencement Date 29 March 2021

Conditions of Consent

Consent Granted: To take groundwater from a bore for horticultural irrigation purposes

Expiry Date: 1 June 2040

Review Date(s): June 2028, June 2034

Site Location: 2976 State Highway 3, Waitotara

Grid Reference (NZTM) 1751385E-5591746N

Catchment: Waitotara

*For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document*

General condition

- a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. The volume taken in any 24 hour period ending at midnight (New Zealand Standard Time) shall not exceed 1,080 cubic metres.
2. The bore shall be easily identifiable by permanent labels, which may be welded or engraved on the casing, or on the equivalent fixed part of the well construction or associated building. The numbering on the label shall be the bore number assigned by Taranaki Regional Council (GND3106).
3. The bore shall include a conduit (or 'dip tube') no less than 30 mm in diameter that provides unimpeded access for measuring the water level within the bore. The conduit shall have an easily removable cap that prevents contaminants entering it.
4. Before exercising this consent the consent holder shall install, and thereafter maintain water measuring and recording equipment at the site of taking (or a nearby site in accordance with Regulation 10 of the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*. This equipment shall be tamper-proof and record the rate and volume of water taken to an accuracy of $\pm 5\%$ at intervals not exceeding 15 minutes.

Note: Water measuring and recording equipment, such as water meters and dataloggers, must be installed, and regularly maintained, in accordance with manufacturer's specifications in order to ensure that they meet the required accuracy. Even with proper maintenance water meters and dataloggers have a limited lifespan.

5. The records of water taken shall:
 - (a) be in a format that, in the opinion of the Chief Executive, Taranaki Regional Council, is suitable for auditing;
 - (b) specifically record the water taken as 'zero' when no water is taken;
 - (c) be transmitted to the Taranaki Regional Council's computer system within 2 hours of being recorded.
6. The consent holder shall provide the Chief Executive, Taranaki Regional Council with a document from a suitably qualified person certifying that water measuring and recording equipment required by the conditions of this consent ('the equipment'):
 - (a) has been installed and/or maintained in accordance with the manufacturer's specifications; and/or
 - (b) has been tested and shown to be operating to an accuracy of $\pm 5\%$.

Consent 10916-1.0

7. The documentation provided in accordance with condition 6 shall be provided:
 - (a) within 30 days of the installation of a water meter or datalogger;
 - (b) at other times when reasonable notice is given and the Chief Executive, Taranaki Regional Council has reasonable evidence that the equipment may not be functioning as required by this consent; and
 - (c) no less frequently than once every five years.
8. If any measuring or recording equipment breaks down, or for any reason is not operational, the consent holder shall advise the Chief Executive, Taranaki Regional Council immediately. Any repairs or maintenance to this equipment must be undertaken by a suitably qualified person.
9. The water measuring and recording equipment shall be accessible to Taranaki Regional Council officers at all reasonable times for inspection and/or data retrieval.
10. The consent holder shall ensure that a continuous record of groundwater level data is maintained. This record shall begin prior to commencement of irrigation by installing an automatic groundwater level recording device in GND 3106 that records the water level at intervals not exceeding 15 minutes to an accuracy of ± 10 mm and is tamper-proof. The cost of establishing and operating the recorder shall be met by the consent holder.
11. At all times the consent holder shall take all practicable steps to take and use water efficiently and generally prevent or minimise any adverse effects on the environment including as minimum, by ensuring that:
 - (a) the minimum amount of water necessary for the purpose is taken;
 - (b) as far as practicable, soil water does not exceed field capacity;
 - (c) there is no surface ponding or runoff; and
 - (d) equipment does not leak.
12. The taking shall not cause the intrusion of salt water into any freshwater aquifer.
13. This consent lapses 5 years after its date of commencement, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

Consent 10916-1.0

14. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2028 and/or June 2034 for the purposes of:
- a. ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or
 - b. to require any data collected in accordance with the conditions of this consent to be transmitted directly to the Council's computer system, in a format suitable for providing a 'real time' record over the internet.

Signed at Stratford on 29 March 2021

For and on behalf of
Taranaki Regional Council



A D McLay
Director - Resource Management

Appendix II

Categories used to evaluate environmental and administrative performance

Categories used to evaluate environmental and administrative performance

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. Administrative performance is concerned with the Company's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

Events that were beyond the control of the consent holder and unforeseeable (that is a defence under the provisions of the RMA can be established) may be excluded with regard to the performance rating applied. For example loss of data due to a flood destroying deployed field equipment.

The categories used by the Council for this monitoring period, and their interpretation, are as follows:

Environmental Performance

High: No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

Good: Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party but these items were not critical, and follow-up inspections showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects; however abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

For example:

- High suspended solid values recorded in discharge samples, however the discharge was to land or to receiving waters that were in high flow at the time;
- Strong odour beyond boundary but no residential properties or other recipient nearby.

Improvement required: Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

Poor: Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent moderate non-compliant activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

Administrative performance

High: The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and were addressed promptly and co-operatively.

Good: Perhaps some administrative requirements of the resource consents were not met at a particular time, however this was addressed without repeated interventions from the Council staff. Alternatively

adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

Improvement required: Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.

Poor: Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.

Appendix III

Active irrigation consents in Taranaki
July 2021 to June 2022

Irrigation Water Takes

Surface water takes

Consent	Consent Holder	Usage	Irrigation system
0017-3.1	Manaia Golf Club	Recreational	K – line
0124-5	Kaitake Golf Club Inc	Recreational	K – line
0132-3	Hawera Golf Club Inc	Recreational	K – line
0189-4	AI & KJ Williams	Pasture Irrigation	Travelling irrigator
0270-3	Westown Golf Club Inc	Recreational	K – line
0278-4	Oceanview Trust	Pasture Irrigation	K – line and flood irrigation
0464-3	Oakura Farms Limited	Horticultural	n/a
0880-3	IHC New Zealand Inc (NORTH TARANAKI)	Horticultural	K – line
1223-3	EO & CP Lander	Horticultural	K – line
1721-3.1	Manukorihi Golf Club Inc	Recreational	K – line
1877-3	Te Ngutu Golf Club Incorporated	Recreational	K – line
2138-3	Riverside Farms Taranaki Ltd	Pasture Irrigation	K – line
4450-2.1	Waitara Golf Club Inc	Recreational	K – line
4494-3	CT & JM McDonald	Pasture Irrigation	K – line
4783-3	Larsen Trusts Partnership	Pasture Irrigation	K – line and travelling irrigator
4993-2	J & EG Sanderson	Pasture Irrigation	K – line
4994-2	J & EG Sanderson	Pasture Irrigation	K – line
5128-2	Coastal Country Farms Limited	Pasture Irrigation	K – line and travelling irrigator
5570-3	Kaihihi Trust	Pasture Irrigation	K – line
5571-2	Jimian Limited	Pasture Irrigation	K – line
5623-2.1	WD & SC Morrison	Pasture Irrigation	Centre pivot and K - line
5636-2	Waiwira Trust	Pasture Irrigation	Centre pivot and K - line
5773-2	Goodin FJ & Sons Limited	Pasture Irrigation	K – line
5778-2	Mara Trust	Pasture Irrigation	K – line
5781-2.1	Waikaikai Farms Limited	Pasture Irrigation	K – line
5791-2	AL & LA Campbell	Pasture Irrigation	K – line
5797-2	Pihama Farms Limited	Pasture Irrigation	K – line
5807-2	Dickie Roger Family Trust	Pasture Irrigation	Centre pivot and K – line
5827-2	Walker & McLean Partnership	Pasture Irrigation	Centre pivot
5829-2	Julian RM & MC Family Trust	Pasture Irrigation	K – line and travelling irrigator
5840-2	Gibbs G Trust	Pasture Irrigation	Centre pivot
5863-2.1	Geary AR Trust (A R Geary)	Pasture Irrigation	Centre pivot and K – line
5876-2	GA & RJ Dorn	Pasture Irrigation	K – line

Consent	Consent Holder	Usage	Irrigation system
5878-2.1	Woollaston Family Trust Partnership	Pasture Irrigation	Travelling irrigator
5887-2	Croftwest Trust	Pasture Irrigation	K – line
5896-2	Kohi Investments Limited	Pasture Irrigation	K – line
5898-2	David Pease Family Trust	Pasture Irrigation	K – line
6159-1	Waireka Trust	Pasture Irrigation	K – line & travelling irrigator
6292-2	New Plymouth Golf Club Inc	Recreational	K – line
6429-1	Leatherleaf Limited	Pasture Irrigation	Centre pivot
6430-1	Fonic Farms Limited	Pasture Irrigation	Centre pivot and K – line
6628-1.1	Hamblyn Family Trusts	Pasture Irrigation	K – line
7346-1.1	Spenceview Farms	Pasture Irrigation	Centre pivot
7372-1	Pukeone Partnership	Pasture Irrigation	Centre pivot
7527-1.1	Pukeone Partnership	Pasture Irrigation	Centre pivot
7528-1.1	Kereone Farms Limited	Pasture Irrigation	Centre pivot
7626-1	NW & DM King	Pasture Irrigation	K – line
7768-1	Carter AJ Limited	Pasture Irrigation	Travelling irrigator
7781-1	D Krumm	Pasture Irrigation	Travelling irrigator
7895-1	Ohawe Farm Limited	Pasture Irrigation	K – line
9577-1.1	MJ Washer Trusts Partnership	Pasture Irrigation	K – line and travelling irrigator
9597-1	Nilock & Camole Trusts	Pasture Irrigation	Centre pivot
10135-1.1	Luttrell Trust Partnership	Pasture Irrigation	K – line

Groundwater takes

Consent	Consent Holder	Usage	Irrigation system
0714-2	GD & HM McCallum	Pasture Irrigation	K – line and travelling irrigator
0721-3	Go 2 Milk Limited	Horticultural	n/a
3312-3.1	The Tom Lance Trust	Horticultural	K – line
5879-2	BR & RG Harvey Family Trust	Pasture Irrigation	n/a
5950-2.1	WD & SC Morrison	Pasture Irrigation	Centre pivot and K - line
6026-1	JR & DM Baker	Pasture Irrigation	K – line
7470-1.2	Taranaki Thoroughbred Racing	Recreational	Travelling irrigator
9561-1	Kereone Farms Limited	Pasture Irrigation	Centre pivot
9608-1.2	D Wilson	Pasture Irrigation	Centre pivot
10369-1	Inglewood Golf Club Inc	Recreational	K – line
10767-1	Alexander Farms Limited	Pasture Irrigation	Centre pivot
10903-1	Summerset Villages	Horticultural	K – line
10916-1	Waitotara Kiwifruit Limited Partnership	Horticultural	K – line

n/a - consent holder does not have any system in place.

Appendix IV

Water take consent usage for 2021-2022

Water take consent usage for 2021-2022

Consent	Consent holder	Consented allowable annual usage (m ³ /annum)	Actual water usage from 1 July 2021 to 30 June 2022 (m ³ /annum)	Percentage of consented volume used
0017-3.1	Manaia Golf Club	36,500	6,652	18%
0124-5	Kaitake Golf Club Inc	47,450	11,300	24%
0132-3	Hawera Golf Club Inc	91,250	n/a ¹	0%
0189-4	AI & KJ Williams	365,000	0	0%
0270-3	Westown Golf Club Inc	131,400	4,506	3%
0278-4	Oceanview Trust	4,320,432	0	0%
0464-3	Oakura Farms Limited	36,500	0	0%
0714-2	GD & HM McCallum	182,500	0	0%
0721-3	Go 2 Milk Limited	30,660	7,214	24%
0880-3	IHC New Zealand Inc (NORTH TARANAKI)	32,120	3,919	12%
1223-3	EO & CP Lander	108,405	6,515	6%
1721-3.1	Manukorihi Golf Club Inc	69,350	7,261	10%
1877-3	Te Ngutu Golf Club Incorporated	73,000	9,494	13%
2138-3	Riverside Farms Taranaki Ltd	756,864	11,832	2%
3312-3.1	The Tom Lance Trust	29,200	20,769	71%
4450-2.1	Waitara Golf Club Inc	18,250	5,349	29%
4494-3	Fresianroots Limited	788,400	4,919	1%
4783-3	Larsen Trusts Partnership	1,169,825	0	0%
4993-2	J & EG Sanderson	1,022,000	100,244	10%
4994-2	J & EG Sanderson	1,186,250	44,332	4%
5128-3	Coastal Country Farms Limited	851,545	0	0%
5570-3	Kaihihi Trust	547,500	17	0%
5571-2	Jimian Limited	1,261,440	0	0%
5623-2.1	WD & SC Morrison	4,730,400	332,022	7%
5636-2	Waiwira Trust	2,584,930	483,386	19%
5773-2	Goodin FJ & Sons Limited	630,720	101,787	16%
5778-2	Mara Trust	630,720	68,044	11%
5781-2.1	Waikaikai Farms Limited	2,269,205	181,244	8%

¹ Consent was exercised, but not required to submit records by the consent or the Regulations

Consent	Consent holder	Consented allowable annual usage (m ³ /annum)	Actual water usage from 1 July 2021 to 30 June 2022 (m ³ /annum)	Percentage of consented volume used
5791-2	AL & LA Campbell	958,125	156,450	16%
5797-2	Pihama Farms Limited	1,314,000	0	0%
5807-2	Dickie Roger Family Trust	6,679,500	725,928	11%
5827-2	PKW Farms LP	821,250	132,087	16%
5829-2	RM & MC Julian Family Trust	1,533,000	153,619	10%
5840-2	Gibbs G Trust	821,250	126,961	15%
5863-2.1	Geary AR Trust (A R Geary)	1,144,640	266,449	23%
5876-2	GA & RJ Dorn	1,350,500	8	0%
5878-2.1	Woollaston Family Trust Partnership	474,500	26,334	6%
5879-2	BR & RG Harvey Family Trust	630,720	7,910	1%
5887-2	BLL Farm Trust	547,500	62,391	11%
5896-2	Kohi Investments Limited	1,460,000	55,538	4%
5898-2	David Pease Family Trust	946,080	90,181	10%
5950-2.1	WD & SC Morrison	313,900	43,509	14%
6026-1	JR & DM Baker	189,070	25,173	13%
6159-1	Waireka Trust	237,250	0	0%
6292-2	New Plymouth Golf Club Inc	292,000	51,895	18%
6429-1	Leatherleaf Limited	912,500	117,250	13%
6430-1	Fonic Farms Limited	1,741,050	0	0%
6628-1.1	Hamblyn Family Trusts	765,770	101,040	13%
7346-1.1	Spenceview Farms	3,815,856	867,036	23%
7372-1	Pukeone Partnership	1,261,440	233,274	18%
7470-2.1	Taranaki Thoroughbred Racing	146,000	15,281	10%
7527-1.1	Pukeone Partnership	5,545,080	652,291	12%
7528-1.1	Kereone Farms Limited	3,416,400	634,695	19%
7626-1	NW & DM King	725,328	116,810	16%
7768-1	Carter AJ Limited	126,144	0	0%
7781-1	D Krumm	105,120	0	0%
7895-1	Ohawe Farm Limited	1,259,250	38,199	3%
9561-1	Kereone Farms Limited	682,550	154,963	23%
9577-1	Bucman Trust	127,750	281	0%

Consent	Consent holder	Consented allowable annual usage (m ³ /annum)	Actual water usage from 1 July 2021 to 30 June 2022 (m ³ /annum)	Percentage of consented volume used
9597-1	Nilock & Camole Trusts	647,875	150,261	23%
9608-1.2	D Wilson	946,080	206,605	22%
10135-1.1	Luttrell Trust Partnership	2,043,533	255,225	12%
10369-1	Inglewood Golf Club Inc	36,500	2,827	8%
10767-1	Alexander Farms Limited	788,400	13,869	2%
10903-1	Summerset Villages	45,333	1,873	4%
10916-1	Waitotara Kiwifruit Limited Partnership	394,200	21,528	5%

Appendix V

Report on consented water permits for farm
and general water supply purposes 2021-2022

Report on water permits for farm and general water supply

Introduction

This report is for water takes for general farm and water supply purposes that have been granted by the Council [water takes in excess of the permitted 1.5 litres per second or 50 cubic metres per day entitlement per property according to the Regional Fresh Water Plan for Taranaki, Rule 15]. This report discusses the consents active to 30 June 2022 and any compliance issues related to them.

These water takes are different to that for water irrigation, as these are used for general farm use and water supply and are used throughout the year unlike irrigation consents that are used for a small portion of the year. These consents generally have different consent conditions attached to them, compared to those for irrigation water, as the takes are generally of a minor nature and generally fall outside the Measurement and Reporting of Water Takes Regulations 2020.

Current water take consents

At 30 June 2022, there were a total of 35 current water take consents for general farm and water supply purposes. Of these eight were from surface water and 27 were from groundwater sources (Table 1).

Table 1 Total consents granted for dairy farm and water supply purposes to 30 June 2022

Consent	Consent holder	Source
1190-3.2	Pungarehu Farmers Group Water Scheme	Surface Water
5413-2	MJ Fahy	Groundwater
5990-2	ID & JA Armstrong	Surface Water
6372-1	Taranaki By-Products Limited	Groundwater
6380-1.1	Caiseal Trust Partnership	Groundwater
6451-2	Nukumaru Water Scheme Society Inc	Groundwater
6903-1	Awatea Hawkes Bay Trust	Groundwater
7272-1	Belmont Dairies Limited	Groundwater
7304-1.2	Gwerder Brothers	Groundwater
7497-1	Te Rua O te Moko 2B Ahuwhenua Trust	Surface Water
7540-1	AJ & DI Dravitzki Trusts Partnership	Groundwater
7569-2	Stoney River Dairy Limited	Groundwater
7608-1	Go 2 Milk Limited	Groundwater
7711-1	Pariroa Marae (The Trustees)	Groundwater
7783-1	Norwood Farm Partnership	Groundwater
7969-1	AB Middleton	Surface Water
9747-1.1	DP & JH Roper Family Trust Partnership	Groundwater
9900-1.1	Kaipu Holdings Limited	Groundwater
9910-1	PKW Farms LP	Groundwater
9947-1	Ngatoro Poultry Limited	Groundwater
10029-1	Hernly Farms Limited	Groundwater

Consent	Consent holder	Source
10112-1	Construction Mechanics (1993) Limited	Groundwater
10113-1.2	Lupton Trust	Groundwater
10120-1.1	SC & MJ O'Neill Family Trust	Groundwater
10199-1	IBEC Holdings	Groundwater
10421-1	Medley Partners	Surface Water
10449-1	Joblin Partners Limited	Groundwater
10484-1	PKW Farms LP	Groundwater
10542-1	Zenith Farms Family Trust	Surface Water
10728-1	Turangarere Trust	Groundwater
10746-1	Hernly Farm Limited	Groundwater
10877-1	Moorelands Trust Partnership	Groundwater
10887-1	Longview Limited	Surface Water
10907-1	K Lupton & D Alexander	Groundwater
10962-1	MP & VMJ Joyce Trusts Partnership	Groundwater

Results and discussion

During the year under review, the Council inspected all water take consents that have a compliance monitoring programme. This meant that some consents were not monitored due to the small nature of the takes, as it was deemed unnecessary, and/or there were no enforceable consent conditions to monitor on the systems.

Of the consents that were inspected, they were checked to ensure that they were compliant with their resource consent conditions, which may include the presence of a flowmeter, a tamperproof flowmeter, adequately screened intakes, bores labelled and cased, pump sheds fenced off, water bodies fenced off, riparian margins planted.

If the consents were required to keep records, the records were either downloaded at the time of the annual inspection, if a data logger was present, or the records were to be sent to the Council by 31 July. **Error! Reference source not found.** lists the consents annual allowable usage and actual water usage for 2021-2022 season.

Table 2 Consents allowable annual water take and 2021-2022 actual annual usage

Consent	Consent holder	Consented allowable annual usage (m ³ /annum)	Actual water usage from 1 July 2021 to 30 June 2022 (m ³ /annum)
1190-3.2	Pungarehu Farmers Group Water Scheme	125,143	77,447
5413-2	MJ Fahy	71,540	861
5990-2	ID & JA Armstrong	43,800	8,072
6372-1	Taranaki By-Products Limited	18,250	n/a
6380-1.1	Caiseal Trust Partnership	36,500	14,166
6451-2	Nukumaru Water Scheme Society Inc	62,050	0
6903-1	Awatea Hawkes Bay Trust	91,250	19,925

7272-1	Belmont Dairies Limited	94,535	46,388
7304-1.2	Gwerder Brothers	78,214	51,696
7497-1	Te Rua O te Moko 2B Ahuwhenua Trust	28,470	20,063
7540-1	AJ & DI Dravitzki Trusts Partnership	18,250	n/a
7569-1	Stoney River Dairy Limited	78,840	Not setup
7608-1	Go 2 Milk Limited	9,125	n/a
7711-1	Pairoa Marae (The Trustees)	18,250	368
7783-1	Norwood Farm Partnership	51,100	33,960
7969-1	AB Middleton	51,100	n/a
9747-1.1	DP & JH Roper Family Trust Partnership	36,500	25,054
9900-1.1	Kaipī Holdings Limited	220,752	90,078
9910-1	PKW Farms LP	40,150	20,615
9947-1	Ngatoro Poultry Limited	127,020	25,803
10029-1	Hernly Farms Limited	126,144	Not operational
10112-1	Construction Mechanics (1993) Limited	47,450	7,178
10113-1.2	Lupton Trust	45,625	38,570
10120-1.1	SC & MJ O'Neill Family Trust	43,800	n/a
10199-1	IBEC Holdings Ltd	2,008	1,103
10421-1	Medley Partners	78,840	35,399
10449-1	Joblin Partners Limited	54,750	33,311
10484-1	PKW Farms LP	50,057	29,364
10542-1.1	Zenith Farms Family Trust	58,400	n/a
10728-1	Turangareere Trust	49,275	6,331
10746-1	Hernly Farm Limited	60,955	17,415
10877-1	Moorelands Trust Partnership	18,250	n/a
10887-1	Longview Limited	58,400	28,088
10907-1	K Lupton & D Alexander	87,600	45,741
10962-1	MP & VMJ Joyce Trusts Partnership	n/a	8,463

n/a – not applicable (no requirement to provided records)

The average annual consented water usage across all consents is 61ML. In contrast, the actual average annual usage is 26ML. The highest water user for the year was Kaipī Holdings with 90ML.

Thirty-four of the consents had an end of year site inspection, with five consent holder being found to be non-compliant with their consent conditions, which resulted in two abatement notices to be issued to require the consent holder to comply with their consent conditions at all times. A summary of this non-compliances identified during the 2021-2022 year, and the Council's response, is presented in Table 3.

Table 3 Consent non-compliance found during 2020-2021

Date	Consent Holder (Consent number)	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
18/07/2022	Te Rua O te Moko 2B Ahuwhenua Trust	Abstraction volume and rate breaches throughout the monitoring year.	N	14 day letter	Letter of explanation received, consent renewal in place to apply for more water.
19/07/2022	Lupton Trust	Abstraction volume breaches throughout the monitoring year.	N	Abatement notice	An abatement notice was issued requiring them to comply with their consent conditions at all times.
19/07/2022	K Lupton & D Alexander	No Datalogger.	N	Abatement notice	An abatement notice was issued requiring them to comply with their consent conditions at all times.
22/07/2022	Turangarere Trust	No flow meter present at time of annual inspection	N	None	Subsequent investigation found that contractors had removed the flow meter due to it not being able to be verified. Contractor has put a new flow meter in and is installed as best practice
22/07/2022	Construction Mechanics (1993) Limited	Flowmeter was not operational at the time of the annual inspection.	N	14 day letter	Letter of explanation received and Council accepted.

Summary

Of the 33 sites inspected, five were found to be non-compliant with their consent conditions. Council will continue to work with all consent holders to ensure they comply their consent conditions in future seasons.

The biggest water user for the 2021-2022 season was Kaipi Holdings Limited with 90ML. The average annual water use across all consents was 26ML.

The Council will continue to monitor these water takes and any new consents that may be granted in the future, as although they are relatively minor in size, it is still important to manage the resources and assess if there are any adverse environmental effects arising from the exercising of these consents.