Fonterra Whareroa
Monitoring Programme
Annual Report
2018-2019

Technical Report 2019-31

ISSN: 1178-1467 (Online)
Document: 2298438 (Word)
Document: 2405080 (Pdf)

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March 2020

Executive summary

Fonterra Co-operative Group Ltd (Fonterra) operates a dairy processing complex located on Whareroa Road at Hawera, in the Tangahoe, Tawhiti and Tasman catchments. Fonterra holds a total of 18 resource consents related to activities undertaken at the Whareroa site to allow for the abstraction of water from the Tawhiti Stream and Tangahoe River; the discharge of river silt and sand back to those two streams; the discharge of stormwater to unnamed tributaries of the Tawhiti Stream, the Tangahoe River and an unnamed coastal stream; the discharge of stormwater and sediment to land; the discharge of dairy factory wastewater to the Tasman Sea; the discharge of laboratory waste and unprocessable wastes to waste pits; the discharge of dairy liquids to land and the discharge of emissions to air. This report for the period July 2018 to June 2019 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess Fonterra's environmental and consent compliance performance during the period under review. This report also details the results of the monitoring undertaken and assesses the environmental effects of their activities.

During the monitoring period, Fonterra demonstrated an overall good level of environmental performance.

The Council's monitoring programme for the year under review included 10 scheduled site inspections; three composite samples from the outfall discharge for inter-laboratory comparison; 30 samples of stormwater pond discharges collected for physicochemical analysis; 10 grab samples of the outfall discharge for physicochemical and microbiological analysis; freshwater inspections and biomonitoring surveys downstream of the stormwater pond discharge points; two intertidal surveys; 30 deposition gauging samples; four nitrogen oxide (NO_x) samples and two periods of fine airborne particulate (PM_{10}) monitoring in relation to air emissions, and auditing of monitoring data collected by Fonterra.

Monitoring showed that the site was generally well managed, and that no adverse environmental effects were discovered during the year. By comparison with previous years, the monitoring indicated an improvement in compliance with water discharges from the site. Initial observations suggest that the recently commissioned in-line stormwater monitoring and diversion system has resulted in improved stormwater quality discharging to the receiving environment. An increase in macroinvertebrate community health was observed in a tributary which had been identified the previous year as having undergone a decline. There were two unauthorised incidents which occurred during the year, one of which resulted in an infringement notice being issued. Environmental management systems and processes were reviewed and improved in response to both incidents.

During the year, Fonterra demonstrated a good level of environmental and high level of administrative performance with the resource consents monitored in this programme.

For reference, in the 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% of the consents, a good level of environmental performance and compliance was achieved.

In terms of overall environmental and compliance performance by the consent holder over the last five years, this report shows that the consent holder's performance was improved in the period under review.

This report includes recommendations for the 2019-2020 year.

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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 2018 to June 2019 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by Fonterra Co-operative Group Ltd (Fonterra). Fonterra operates a dairy processing complex situated on Whareroa Road at Hawera.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by Fonterra that relate to abstractions and discharges of water within the Tangahoe and Tawhiti catchments and discharges to the Tasman Sea. This report also covers the air discharge permits held by Fonterra to cover emissions to air from the site.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of Fonterra's use of water, land and air, and is the 26th combined annual report by the Council for Fonterra.

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 RMA and the Council's obligations;
- the Council's approach to monitoring sites though annual programmes;
- the resource consents held by the Fonterra relating to activities on and around the Whareroa site;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted in Fonterra'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 2018-2019 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' inasmuch 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 Fonterra, this report also assigns them a rating for their environmental and administrative performance during the period under review.

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 Fonterra'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, 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.

For reference, in the 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% of the consents, a good level of environmental performance and compliance was achieved.[1]

1.2 Process description

The Whareroa dairy factory was established in 1972 and is currently operated by Fonterra. The site processes up to 14 million litres of milk a day and produces the largest volume of dairy ingredients from a single factory worldwide. Annually, the factory produces about 428,000 tonnes of milk powder, cheese, cream, protein and lactic casein ingredients (Table 1).

Table 1 Product manufactured at Fonterra annually

Generic product	Metric tonnes/season
Whole & skim milk powders	200,000
Cheese products	95,000
Cream products	88,000
Protein products	35,000

[1] The Council has used these compliance grading criteria for 15 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

Generic product	Metric tonnes/season
Lactic casein	10,000
Total	428,000

The Whareroa site covers approximately 25 ha and is situated on Whareroa Road, east of Hawera (Photo 1). The site includes five milk powder dryers, two cheese plants, a casein plant, a butter plant, a whey plant, a laboratory, a tanker depot, a co-generation plant, a water treatment plant, a rail siding and storage for finished product.

Significant expansion of the factory occurred during the 1996-1997 season. Kiwi Co-operative Dairies greatly increased its milk supply area through the acquisition of small dairy companies in the South Island and the Hawke's Bay and through a merger with the Tui Dairy Company in the Manawatu. Accordingly, the construction of a number of new plants, the upgrade of several existing plants, and improvements in waste treatment systems were undertaken during the 1996-1997 monitoring period.

Currently, the site obtains its water supply from two nearby surface waterways and supplements this with water derived from the milk process (i.e. condensate). Wastewater is discharged through a long marine outfall (1,845 m). Energy is mainly sourced from two on-site gas-fired co-generation plants, operated as a joint venture with Todd Energy Ltd. The 68 Mega Watt plants provide all the steam and electricity requirements for the site.

The consolidation of the dairy processing industry in Taranaki has led to a corresponding centralisation of discharges to both air and water. In 1981 there were 22 dairy processing sites in Taranaki and the resulting discharges to air and water and abstraction of water were dispersed throughout the region. Now the environmental effects are largely confined to the activities at the Whareroa site.

In the 2014-2015 season, a new distribution centre was constructed at the Whareroa site, almost doubling the site's total dry storage capacity to 70,000 tonnes. A new rail loop and siding were constructed to enable increased load out of product by rail. Together, these developments mean a reduction in freight movements by road and more movements by rail.

In the 2015-2016 season, a new chemical storage facility was installed at the tanker workshop, and a new water treatment plant was built (commissioned in August 2016). The plant enables Fonterra to produce water that meets drinking water standards while minimising the amount of water abstracted from the two rivers. The new plant uses less water for back-flushing the filters. The construction of two settling lagoons allows for the recycling of up to 10% of the back-flushing water through the treatment plant.

In the 2016-2017 season, a Reverse Osmosis Plant was installed in the Utilities Department. This system now treats evaporator condensate so that it can be used on site; reducing the amount of water that is abstracted from the rivers. Numerous improvements were made to plants to reduce losses and maximise yield of product which has led to a decrease in fat, COD and suspended solids in the wastewater, compared with previous years. Particulate meters were installed in the dryer exhaust stacks of the Powder-2 and Whey Products powder plants; enabling real-time monitoring of the quality of the air emissions, providing assurance that emissions control measures are working correctly.

Several projects were completed during the 2017-2018 period. These projects were driven by internal targets for reducing energy use, water use and waste volumes, whilst increasing product yield. Some examples of these projects are included below.

- A project in the Casein plant enabled recovery of the curd "wash water" for further processing, which previously went to drain. This has significantly reduced the protein, fat and lactose in the plant wastewater.

- Condensate water recovery has been recommissioned in Powder 2; diverting water for use in other plants, rather than going to wastewater.
- A major capital project began installing inline real-time monitoring of the site stormwater (for pH, conductivity and suspended solids) with the ability to divert contaminated stormwater to newly constructed Contingency Ponds.
- Energy and water use was reduced in the Milk Treatment department by reducing the rinse times during CIPs (clean in place).
- The wastewater loss monitoring and loss reduction programs continued with increased focus in the 2017-2018 season. Losses were reported at daily management meetings, while water and energy usage is reported on a weekly basis.

Further plant upgrades were undertaken in the 2018-2019 season, as discussed in Section 2.1.

Photo 1 The Fonterra Whareroa site

1.3 Resource consents

Fonterra holds 18 resource consents the details of which are summarised in the table below. Summaries of the conditions attached to each permit are set out in Section 3 of this report.

A summary of the various consent types issued by the Council is included in Appendix I, as are copies of all permits held by the Fonterra during the period under review.

Table 2 Summary of resource consents held by Fonterra for the Whareroa site

Consent number	Purpose	Granted	Review	Expires
Water abstraction permit				
0047-4	To take water from the Tawhiti Stream and the Tangahoe River for the purposes of processing and manufacturing dairy products, cleaning of plant, cooling, domestic use and for a co-generation plant	Nov 2017	June 2021	June 2052
Water discharge permits				
1450-3	To discharge all wastewater from dairy factory processes and associated processes undertaken at the Whareroa dairy processing site through a marine outfall into the Tasman Sea	Nov 2017	June 2021	June 2052
3902-3	To discharge stormwater from the Whareroa milk processing site into an unnamed tributary of the Tangahoe River	Feb 2014	June 2022	June 2028
3907-3	To discharge stormwater, back flushing from the sand filters and intermittent discharges of treated water from a reservoir, from the Whareroa milk processing site into an unnamed tributary of the Tawhiti Stream	Feb 2014	June 2022	June 2028
4133-3.1	To discharge stormwater, backwash and treated process water from the Whareroa milk processing site and the Water Treatment Plant into Unnamed Stream 18	Jan 2016	June 2022	June 2028
4927-2	To discharge river silt and sand from mechanical pre-filtering of river water during abstraction of water, by returning it into the Tawhiti Stream	Nov 2017	June 2021	June 2052
5148-2	To discharge river silt and sand from mechanical pre-filtering of river water during abstraction of water, by returning it into the Tangahoe River	Nov 2017	June 2021	June 2052
Air discharge permit				
4103-2.3	To discharge emissions into the air from the manufacture and processing of milk products and associated processes	Jul 2018	June 2020	June 2025
5044-2	To discharge emissions into the air from the disposal of laboratory wastes, and stormwater and sump cleanings onto and into land	Feb 2004	-	June 2022
6257-1.1	To discharge emissions into the air from dual fuel boilers (gas or coal) with a maximum energy output of 250 MW together with associated processes	June 2015	June 2022	June 2034
6273-1.1	To discharge emissions into the air from 'Cogen-I' and 'Cogen-II' co-generation energy generating plants with an energy output of 70 MW together with associated processes	Oct 2018	June 2020	June 2025
7465-1	To discharge emissions into the air from the combustion of waste wood packaging	Mar 2009	June 2022	June 2028
Discharges of waste to land				

Consent number	Purpose	Granted	Review	Expires
4406-2	To discharge laboratory wastes onto and into land	Feb 2004	-	June 2022
5036-2	To discharge waste material from stormwater sumps and road sump and unprocessable dairy factory wastes onto and into land	Dec 2012	-	June 2022
9908-1	To discharge dairy liquids onto land and the associated emissions to air, in various locations throughout the Taranaki region	June 2014	June 2020	June 2034
	Land use permits			
10208-1	To construct, place and use a water intake structure in the bed of the Tangahoe River for industrial water supply purposes, including associated discharge of construction stormwater from the site	Feb 2016	June 2022	June 2028
5845-1	To remove, reconstruct, erect, place and maintain a dam structure and associated fish pass on the Tawhiti Stream for water intake purposes	July 2001	-	June 2015*
	Coastal permits			
5013-2	To occupy the Coastal Marine Area with and carry out routine maintenance on: • a marine outfall pipeline and diffuser structure approximately 1845 metres long; and • a rock wall approximately 100 metres long for the protection of the outfall, stream diversion pipelines and associated structures	Nov 2017	June 2021	June 2052

* This consent expired in June 2015, however, the legality of the structure as a permitted activity is currently being investigated.

1.4 Monitoring programme

1.4.1 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.

The monitoring programme for the Whareroa site consisted of seven primary components.

1.4.2 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.

1.4.3 Site inspections

The Whareroa site was visited 10 times during the monitoring period. With regard to consents for the abstraction of or discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. Air inspections focused on plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions. Sources of data being collected by Fonterra were identified and accessed, so that performance in respect of operation, internal monitoring, and supervision could be reviewed by the Council. The neighbourhood was surveyed for environmental effects.

1.4.4 Discharge sampling

1.4.4.1 Water

The stormwater discharge was sampled on 10 occasions (from three points) and the samples analysed for alkalinity, COD, biological oxygen demand (BOD and filtered carbonaceous BOD), conductivity, pH, free and total chlorine, oil and grease and suspended solids.

The outfall discharge was sampled on 10 occasions and analysed for *E. coli* and enterococci, oil and grease, suspended solids, COD, pH and conductivity.

Inter-laboratory comparisons of a 24 hour time-proportional sample were carried out on three occasions and analysed for conductivity, pH, fats, COD, alkalinity, BOD, suspended solids, nitrogen, phosphorus, faecal coliforms and turbidity.

1.4.4.2 Air

The Council undertook sampling of both the emissions from the site and the ambient air quality in the areas surrounding the site.

Deposition gauges were placed at five selected sites in the vicinity of the factory on six occasions. The samples collected were analysed for total deposited milk powder.

A 'DustTrak' monitor was deployed on two occasions in the vicinity of the site in order to monitor levels of inhalable particulates (PM_{10}).

Monitoring of ambient nitrogen oxide (NO_x) levels at the site was conducted on two occasions using passive absorption discs at four sampling sites.

1.4.5 Freshwater ecological surveys

A biological inspection was performed on one occasion during spring in tributaries of the Tawhiti Stream, and an unnamed coastal stream, to determine whether or not the discharge of stormwater from the site has had a detrimental effect upon the biological communities of the streams. A spring biomonitoring survey was carried out in the tributary of the Tangahoe River in place of the biological inspection during the year under review, following recommendations made in the previous monitoring report.

A six site biomonitoring survey was undertaken during summer in tributaries of the Tawhiti Stream (two sites), Tangahoe River (three sites) and an unnamed coastal stream (one site) to assess whether stormwater discharges had had any adverse effects on the macroinvertebrate communities of these streams. Samples were processed to provide number of taxa (richness), MCI and $SQMCI_S$ scores for each site. They were also checked for heterotrophic growths.

A fish survey is undertaken in the Tawhiti Stream every three years in order to assess if the intake, fish pass, or discharge of sediment undertaken in relation to the Fonterra Whareroa water abstraction have had any impact on the fish communities of the Tawhiti Stream. This survey was carried out in the 2016-2017 monitoring year and is next due to be undertaken in 2019-2020.

1.4.6 Marine ecological surveys

A marine ecological survey was performed on two occasions at sites on the coast surrounding the marine outfall to determine whether the discharge of wastewater through the outfall has had a detrimental effect upon the intertidal marine communities.

1.4.7 Review of Fonterra monitoring data

Fonterra routinely monitors the wastewater discharge for a number of physical, chemical and biochemical parameters. Results are forwarded to the Council along with data relating to water abstractions from the Tangahoe catchment.

Fonterra's independent consultants, CRL Energy Ltd, carried out powder emission measurements on drier exhaust stacks between September 2018 and March 2019. The Council undertook a review of all data upon receipt.

2 Results

2.1 Plant upgrades and improvements

The Whareroa Stormwater Project (WSP) was completed and fully operational midway through the 2018-2019 season. The WSP is a comprehensive stormwater monitoring and containment scheme which continuously monitors stormwater quality, alerts staff to potential stormwater contamination events in real time and automatically diverts any contaminated stormwater to newly constructed contingency ponds. The project involved the installation of inline monitoring in the five main stormwater sumps. These instruments continuously analyse the stormwater for turbidity, pH and conductivity. Any stormwater that exceeds set trigger levels for these parameters is automatically diverted to one of three stormwater contingency ponds, preventing non-compliant stormwater from discharging to waterways. At the same time, the system alerts staff on site that a stormwater event has occurred. This was a significant capital investment to protect the local waterways and reduce the risk of non-compliance.

Particulate meters were installed on the three Powder 3 drier exhausts stacks. These meters now provide a real time indication of the particulate concentration being emitted from the stacks. The plant has trigger limits in place which drive actions to be taken when the levels increase. This information has helped the plant better understand the effects that various plant operating conditions can have on emissions concentrations.

Solid waste reduction targets have been set for the site. In the 2018-2019 season the site achieved a 3% reduction in solid waste to landfill compared to the previous season. This work is continuing into the 2019-2020 season with the reduction targets increasing each year.

A number of water and energy reduction initiatives were carried out at the site which resulted in a reduction in water abstraction by over 520 million litres for the year.

2.2 Water

2.2.1 Inspections

Routine site inspections were conducted on a monthly basis throughout the 2018-2019 dairy season. A total of ten site inspections were undertaken between August 2018 and May 2019, with each visit including an assessment of stormwater catchments, chemical storage, truck wash areas, and general site maintenance and management. The three stormwater discharges and the wastewater discharge to the Tasman Sea were also inspected and sampled during the visits.

No major issues were identified during inspections in the year under view. IBC valve seals were continually corroding, with minor volumes of chemicals found to have crystallised on the valves. However, these chemicals were kept covered and bunded so no chemicals discharged to stormwater. Fonterra monitor these IBCs as it is an ongoing issue. On one occasion, a 200 L chemical drum was found to be in use with no bund in place; this issue was resolved at the time of the inspection. A leaking flange was discovered amongst the milk train CIP pipework. This resulted in an ongoing discharge of mildly caustic solution into the site's wastewater network. This issue was identified on a number of occasions and was finally resolved during the end of season shut down. The site's in-line stormwater monitoring and diversion system was commissioned in January 2019.

Overall, site management was found to be good throughout the monitoring period. Based on the inspections that were undertaken, the site remained in compliance with consent conditions.

2.2.2 Water abstraction

Fonterra holds resource consent 0047-4, which authorizes a daily abstraction of up to 30,000 m^3/day of water from two locations in the Tangahoe catchment; including the Tawhiti Stream and the Tangahoe River. The exercise of this consent is monitored by both Fonterra and the Council.

Fonterra continuously measures abstraction rates for both intakes and daily abstraction rate data has been supplied on a monthly basis to the Council for review. Instantaneous abstraction data is also telemetered to the Council's database.

Photo 2 Tangahoe River intake structure

The Council maintains telemetered hydrological recorders in the Tawhiti Stream and Tangahoe Rivers, downstream of the abstraction points, to monitor compliance with flow restrictions on consent 0047-4.

Abstraction limits

Condition 1 states that the total amount of water abstracted from the Tawhiti and Tangahoe locations over 24 hours (from 06:00 to 06:00) must not exceed 30,000 m^3. A summary of the abstraction data provided by Fonterra is presented in Table 3. Compliance with the maximum daily abstraction volume has been determined in terms of number of days that limits were breached. Fonterra was found to be compliant with these conditions for the duration of the monitoring period. The maximum daily abstraction from the Tawhiti Stream was 22,965 m^3 which occurred on 10 September 2018. The maximum daily abstraction from the Tangahoe River was 23,445 m^3 which occurred on 18 February 2019. The maximum combined daily abstraction locations was 24,813 m^3 on 21 December 2018.

Table 3 Summary of abstraction rate data for 2018-2019

Month	Tawhiti Stream			Tangahoe River			Total abstraction		
	Mean m^3/day	Max m^3/day	Breach days	Mean m^3/day	Max m^3/day	Breach days	Mean m^3/day	Max m^3/day	Breach days
July	4,726	10,352	0	1,374	9,568	0	6,099	10,352	0
August	13,298	18,553	0	126	2,491	0	13,424	18,553	0
September	19,894	22,965	0	0	0	0	19,894	22,965	0
October	13,589	22,086	0	7,689	12,345	0	21,278	24,520	0
November	9,940	15,937	0	10,784	13,199	0	20,724	23,136	0
December	10,405	12,296	0	9,668	14,444	0	20,073	24,813	0
January	6,681	11,352	0	12,374	21,557	0	19,055	21,583	0
February	0	0	0	19,744	23,445	0	19,744	23,445	0

Month	Tawhiti Stream			Tangahoe River			Total abstraction		
	Mean m^3/day	Max m^3/day	Breach days	Mean m^3/day	Max m^3/day	Breach days	Mean m^3/day	Max m^3/day	Breach days
March	0	0	0	17,206	20,468	0	17,206	20,468	0
April	62	1,874	0	15,603	19,955	0	15,666	19,955	0
May	830	7,638	0	10,145	14,292	0	10,975	14,292	0
June	3,582	12,070	0	18	541	0	3,600	12,070	0

Condition 2 states that when the flow in the Tawhiti Stream is less than 800 L/s, the rate of taking from the Tawhiti Stream shall not exceed 184 L/s, unless the turbidity of the Tangahoe River at the take site is greater than 850 NTU, and then the rate shall not exceed 347 L/s.

In 2018-2019, there were just under 194 days where the flow in the Tawhiti Stream was less than 800 L/s, during which time the abstraction rate exceeded 184 L/s for a total of 220 minutes (3 ¾ hours). However, river flow and abstraction data have associated levels of accuracy of ±10% and 5±, respectively. Therefore, when assessing compliance with Condition 2, the hard lower limit for river flow is 720 L/s, and the hard upper limit for abstraction rate is 193 L/s. The maximum abstraction rate when flow was less than 720 L/s was 190.7 L/s, on 27 June 2019, when the Tawhiti flow rate was 614 L/s. Based on these results, this condition was complied with during 2018-2019 (Appendix II). Turbidity in the Tangahoe River during the year remained less than 850 NTU.

Minimum flows

Condition 3 states that no abstraction shall occur when the flow immediately downstream of the Tangahoe River take site is less 450 L/s (though this can be as low as 273 L/s during an 'emergency period' of up to 48 hours under Condition 5). Additionally, for 21 days of the monitoring year, Fonterra are able to continue abstracting from the Tangahoe when the flow is between 300 and 450 L/s under Condition 4. The minimum flow was maintained above 450 L/s during 2018-2019 (Appendix II). The minimum flow recorded during the year was 669 L/s on 1 March 2019.

Condition 3 also states that no abstraction shall occur when the flow in the Tawhiti Stream is less than 240 L/s (though this can be as low as 50 L/s during an 'emergency period' of up to 48 hours under Condition 5). The minimum flow was maintained above 240 L/s during 2018-2019 (Appendix II). The minimum flow recorded during the year was 241 L/s on 2 March 2019.

2.2.3 Stormwater

Figure 1 Approximate stormwater catchments at the Whareroa site

There are three stormwater catchments covering the Whareroa site. The northern catchment drains to an unnamed tributary of the Tawhiti Stream (consent 3907), the eastern catchment drains to an unnamed tributary of the Tangahoe River (consent 3902), while the southern catchment drains to an unnamed coastal stream (consent 4133). The discharge to the unnamed tributary of the Tawhiti Stream can also include intermittent discharges of back flushing from sand filters and chlorinated water from the water reservoir. The approximate stormwater catchment areas at the Whareroa site are shown in Figure 1.

Each of the discharges are from a detention pond system designed to contain any spillage that occurs on the site and to attenuate storm flows. The two-pond system in the Tangahoe catchment was completed in May 1996. The benefits of this system were immediately apparent in the results of monitoring in the unnamed tributary.

There are now two stormwater ponds in the southern catchment (the unnamed coastal stream) following major upgrade works undertaken during the 2014-2015 year (Photo 3). The second pond was installed to ensure sufficient capacity to treat the stormwater following the site expansion. The construction of the new distribution centre increased the size of the catchment area for the southern stormwater discharge.

Photo 3 Southern stormwater pond following upgrade (surrounded by native riparian plantings)

The detention pond system at the headwaters of the unnamed tributary of the Tawhiti Stream (Photo 4) was upgraded in July 1998. The previous, single pond rapidly filled with sediment from sand filter back-flushing and was therefore ineffective as a detention pond. This pond was replaced with a three-pond system. In response to Abatement Notice 11657, issued February 2011, Fonterra undertook extensive works on the Tawhiti stormwater system during 2011 in order to prevent the growth of sewage fungus in the Tawhiti stormwater ponds and the downstream tributaries. These works included cleaning out the third settlement pond, modifying the outlet structures between the three ponds and repairing the stormwater isolation sump adjacent to the water treatment plant. A marked improvement in pond water quality has occurred following completion of these works.

Photo 4 Tawhiti stormwater pond following remedial work

In a voluntary initiative, Fonterra has fenced off and planted areas around the ponds with native vegetation and wetland plants to create wetlands that will help maintain the health and habitat of the small streams that receive the discharges. The plantings are progressively being extended down the riparian margins under Riparian Plan 372, and have been found to be well tended during inspections by the Council.

During the 2018-2019 reporting period, the monitoring of stormwater discharges consisted of three components; the collection of stormwater discharge samples, a freshwater biological inspection of each of the unnamed tributaries and a macroinvertebrate survey of six sites in an unnamed tributary of the Tawhiti stream, the Tangahoe River, and an unnamed coastal stream.

2.2.3.1 Discharge monitoring

Discharge samples were collected during each site inspection. The samples were analysed for temperature, conductivity, pH, alkalinity, oil and grease, total residual chlorine, free chlorine, suspended solids, turbidity, chemical oxygen demand (COD), biochemical oxygen demand (BOD) and filtered carbonaceous biochemical oxygen demand (BODCF). Parameters, with associated consent limits, are listed in Table 4. Samples were analysed by Hill Laboratories.

Table 4 Limits for stormwater composition for each parameter 2018-2019 (consents 3902, 3907, 4133)

Parameter	Units	Consent limit*		
		3902	3907	4133
Temperature	°C	25	25	25
Oil and grease	g/m^3	5	5	5
Total residual chlorine	g/m^3	0.2	0.2	0.2
pH	pH	6.0-9.0	6.0-9.0	6.0-9.0
Suspended solids	g/m^3	30	30	100
BOD	g/m^3	10	10	10
BODCF	g/m^3	2.0	2.0	2.0

* Consent limits apply to eight out of ten consecutive samples over the course of an annual monitoring period

Tributary of Tawhiti Stream

Samples of the discharge to the Tawhiti tributary are taken at the outlet of the three-pond system. Since the construction of the three-pond system, there has been a considerable decrease in the levels of BOD and suspended solids in the discharge, while temperature, conductivity and pH have remained constant. Oil and grease (O&G) and free chlorine levels have typically remained low since the site upgrade.

Samples results for the discharge to the Tawhiti tributary are presented in Table 5. A summary of previous results, since the installation of the three-pond system in 1998, is also included for comparison.

Table 5 Sample results for the stormwater discharge to an unnamed tributary of the Tawhiti Stream

Parameter	Alkalinity	BODCF	BOD	COD	Cond.	O&G	pH	SS	Turb.	Temp.	Total Cl_2	Free Cl_2
Unit	**g/m^3 $CaCO_3$**	**g/m^3**	**g/m^3**	**g/m^3**	**µS/cm @ 25°C**	**g/m^3**	**pH**	**g/m^3**	**NTU**	**°C**	**g/m^3**	**g/m^3**
Summary statistics previous data (November 1998 to June 2018)												
Minimum	23	0.06	0.25	2.5	150	0.25	7.0	1	1.0	8.0	0.005	0.005
Maximum	157	19	21	210	408	7.6	9.9	660	350	22.5	0.3	0.3
Median	65	0.5	1.1	11	273	0.25	7.6	8	5.8	15.6	0.05	0.05
Number	137	83	144	141	143	140	143	141	104	140	143	142
2018-2019 monitoring results												
16 Aug 2018	60	<1	1.6	<6	263	<4	7.6	6	10.2	12.2	0.13	<0.07
13 Sep 2018	68	<1	1.1	8	306	**25**	7.4	<8	5.0	13.0	<0.07	<0.07
18 Oct 2018	72	<1	0.9	<6	315	4	7.4	<3	3.0	16.4	<0.07	<0.07
21 Nov 2018	72	<1	1.7	8	300	**6**	7.7	<3	2.4	16.0	<0.07	<0.07
18 Dec 2018	60	<1	1.0	<6	264	<4	7.2	4	2.7	21.9	0.1	0.08
16 Jan 2019	53	<1	<0.8	9	234	<4	7.4	3	3.0	18.5	<0.07	<0.07
20 Feb 2019	70	<1	1.2	<6	307	<4	8.2	3	1.90	19.6	0.2	0.1

Parameter	Alkalinity	BODCF	BOD	COD	Cond.	O&G	pH	SS	Turb.	Temp.	Total Cl_2	Free Cl_2
Unit	**g/m³ $CaCO_3$**	**g/m³**	**g/m³**	**g/m³**	**µS/cm @ 25°C**	**g/m³**	**pH**	**g/m³**	**NTU**	**°C**	**g/m³**	**g/m³**
28 Mar 2019	36	<1	2.0	10	150	<4	7.2	5	4.4	19.4	<0.07	<0.07
17 Apr 2019	61	<1	1.0	<6	256	<4	7.4	3	1.69	16.1	<0.07	<0.07
22 May 2019	67	<1	<0.8	<6	291	<4	7.2	<3	1.99	13.6	<0.07	<0.07
Consent limit*	**-**	**2.0**	**10**	**-**	**-**	**5**	**6.0 – 9.0**	**30**	**-**	**25**	**0.2**	**-**

Refer to glossary for an explanation of abbreviations
Consent limits apply to eight out of ten consecutive samples over the course of an annual monitoring period
'Less than values' in the summary statistics have been halved

Elevated oil and grease concentrations were detected twice, on 13 September and 21 November 2018 (25 and 6 g/m^3, respectively). The result from 13 September 2018 was the highest ever recorded. However, it should be noted that the test method for oil and grease changed in April 2018, when the Council laboratory closed and samples were instead sent to an external laboratory. Technically, the new oil and grease method is more sensitive, as it is able to detect a wider range of plant and animal oils than the previous test. No other stormwater contaminants exceeded consent thresholds during the 2018-2019 monitoring year.

Overall, no single parameter exceeded the consent limit on three occasions or more, therefore, stormwater samples were fully compliant during the year. The contaminants not assessed against consent limits were comparable with those from previous surveys.

Tributary of Tangahoe River

Samples of the discharge to the Tangahoe tributary are taken at the outlet of the two-pond system. The characteristics of the discharge have changed since the construction of the ponds. On average, the temperature, conductivity, alkalinity, BOD and O&G values recorded have decreased, while the pH and chlorine values have increased.

Samples of the discharge to the Tangahoe tributary are presented in Table 6. A summary of previous results, since the installation of the two-pond system in 1996, is also included for comparison.

Table 6 Sample results for the stormwater discharge to an unnamed tributary of the Tangahoe River

Parameter	Alkalinity	BODCF	BOD	COD	Cond.	O&G	pH	SS	Turb.	Temp.	Total Cl_2	Free Cl_2
Unit	**g/m³ $CaCO_3$**	**g/m³**	**g/m³**	**g/m³**	**µS/cm @ 25°C**	**g/m³**	**pH**	**g/m³**	**NTU**	**°C**	**g/m³**	**g/m³**
Summary statistics previous data (May 1996 to June 2018)												
Minimum	28	0.25	0.6	5	40	0.25	6.8	1	0.67	8.1	0.005	0.005
Maximum	235	3.6	93	220	576	1.7	9.8	110	48	23.5	0.5	0.4
Median	119	1	5.2	21	367	0.25	7.9	11	5.6	16.4	0.1	0.05
Number	143	82	148	147	148	145	149	147	102	146	145	145
2018-2019 monitoring results												
16 Aug 2018	141	1.1	3	10	50.3	<4	8.0	9	5.5	12.1	<0.07	<0.07

Parameter	Alkalinity	BODCF	BOD	COD	Cond.	O&G	pH	SS	Turb.	Temp.	Total Cl_2	Free Cl_2
Unit	g/m^3 $CaCO_3$	g/m^3	g/m^3	g/m^3	µS/cm @ 25°C	g/m^3	pH	g/m^3	NTU	°C	g/m^3	g/m^3
13 Sep 2018	134	<1	5	22	481	**26**	7.8	15	6.1	12.9	<0.07	<0.07
18 Oct 2018	172	<1	3	8	545	<4	8.3	10	5.3	16.3	0.12	0.11
21 Nov 2018	173	<1	3.1	20	526	<4	8.2	7	4.3	18.3	**0.22**	0.17
18 Dec 2018	104	<1	2.4	10	316	<4	7.6	5	3.7	22.4	**0.24**	0.22
16 Jan 2019	65	**2.7**	8	24	211	<4	7.1	11	5.6	18.5	<0.07	<0.07
20 Feb 2019	180	<1	1.6	13	544	<4	8.5	7	2.6	21.6	0.14	0.07
28 Mar 2019	128	<1	2.7	16	414	<4	7.5	4	3.0	19.5	<0.07	<0.07
17 Apr 2019	84	<1	<0.8	6	294	<4	7.5	<3	0.58	15.7	<0.07	<0.07
22 May 2019	132	<1	<0.8	<6	483	<4	7.5	<3	0.76	13.0	<0.07	<0.07
Consent limit*	-	**2.0**	**10**	-	-	**5**	**6.0 – 9.0**	**30**	-	**25**	**0.2**	-

Refer to glossary for an explanation of abbreviations
Consent limits apply to eight out of ten consecutive samples over the course of an annual monitoring period
'Less than values' in the summary statistics have been halved

Oil and grease exceeded the consent threshold once, on 13 September 2018 (26 g/m^3). Total chlorine concentrations technically exceeded the consent threshold twice, on 21 November and 18 December (0.22 and 0.24 g/m^3, respectively). However, the margin of error with this test method is 0.05 g/m^3, so these results should be interpreted with caution. To address this in the future, if a result is less than 0.05 g/m^3 above the limit, then the test will be repeated for confirmatory purposes. Filtered carbonaceous BOD (BODCF) exceeded the respective consent limit once on 16 January 2019 (2.7 g/m^3). No other stormwater contaminants exceeded consent thresholds during the 2018-2019 monitoring year.

Overall, no single parameter exceeded the consent limit on three occasions or more, therefore, stormwater samples were fully compliant during the year. The contaminants not assessed against consent limits were comparable with those from previous surveys.

Unnamed coastal stream

Samples of the discharge to the unnamed coastal stream are presented in Table 7. A summary of previous results, since November 1994, is also included for comparison.

Table 7 Sample results for the stormwater discharge to an unnamed coastal stream

Parameter	Alkalinity	BODCF	BOD	COD	Cond.	O&G	pH	SS	Turb.	Temp.	Total Cl_2	Free Cl_2
Unit	g/m^3 $CaCO_3$	g/m^3	g/m^3	g/m^3	µS/cm @ 25°C	g/m^3	pH	g/m^3	NTU	°C	g/m^3	g/m^3
Summary statistics previous data (November 1994 to June 2017)												
Minimum	16	0.25	0.8	5	36	0.25	6.6	2	1.1	7.7	0.005	0.005
Maximum	130	5.9	22	97	512	2.8	8.5	78	44	23.5	0.7	0.6
Median	72	1.3	7.2	28.5	290	0.25	7.4	16	9	15.7	0.05	0.05

Parameter	Alkalinity	BODCF	BOD	COD	Cond.	O&G	pH	SS	Turb.	Temp.	Total Cl_2	Free Cl_2
Unit	**g/m³ $CaCO_3$**	**g/m³**	**g/m³**	**g/m³**	**µS/cm @ 25°C**	**g/m³**	**pH**	**g/m³**	**NTU**	**°C**	**g/m³**	**g/m³**
Number	145	80	150	148	149	148	150	149	100	147	147	149
2018-2019 monitoring results												
16 Aug 2018	71	<1	0.9	<6	343	<4	7.6	5	3.6	11.7	<0.07	<0.07
13 Sep 2018	67	<1	0.8	7	328	**9**	7.6	<3	1.26	12.3	<0.07	<0.07
18 Oct 2018	67	<1	0.9	<6	309	<4	7.4	<3	1.96	15.6	<0.07	<0.07
21 Nov 2018	76	<1	1.3	14	329	3	7.5	4	2.2	16.4	0.13	0.03
18 Dec 2018	56	2.0	5	30	212	**16**	7.3	10	7.6	22.7	0.10	0.10
16 Jan 2019	29	**9.7**	**27**	70	123	**13**	6.8	34	16.4	18.5	<0.07	<0.07
20 Feb 2019	93	<1	2.9	14	340	<4	7.7	9	5.0	20.8	0.13	0.16
28 Mar 2019	46	1.1	4.8	20	190	<4	7.5	14	9.1	18.6	<0.07	<0.07
17 Apr 2019	44	<1	1.0	<6	234	<4	7.4	4	1.24	14.6	<0.07	<0.07
22 May 2019	59	<1	2.7	7	295	<4	7.4	5	2.1	12.9	<0.07	<0.07
Consent limit*	-	**2.0**	**10**	-	-	**5**	**6.0 – 9.0**	**100**	-	**25**	**0.2**	-

Refer to glossary for an explanation of abbreviations
Consent limits apply to eight out of ten consecutive samples over the course of an annual monitoring period
'Less than values' in the summary statistics have been halved

The oil and grease limit was exceeded on three occasions during the 2018-2019 year, on 13 September 2018, 18 December 2018 and 16 January 2019 (9, 16 and 13 g/m^3, respectively). BOD and filtered carbonaceous BOD also exceeded their associated limits on 16 January 2019 (9.7 and 27 g/m^3, respectively). On this sampling occasion it was noted that the discharge was turbid yellow, and had a strong organic odour. No other stormwater contaminants exceeded consent thresholds during the 2018-2019 monitoring year.

Although there were three elevated oil and grease results during the year, these samples were not deemed to constitute a consent non-compliance due to the change in analytical method. This issue is discussed further in Section 2.4. No other results constituted a non-compliance, and contaminants not assessed against consent limits were comparable with those from previous surveys.

2.2.3.2 Freshwater biomonitoring and biological inspections (spring survey)

A three site biomonitoring survey was undertaken using either the Council's standard 400 ml 'vegetation sweep' method or the 'kick-sampling' method, in a tributary of the Tangahoe River to assess whether stormwater discharges had had any adverse effects on the macroinvertebrate communities of these streams. Samples were processed to provide number of taxa (richness), MCI and $SQMCI_S$ scores for each site. They were also checked for heterotrophic growths. In addition, a biological inspection was carried out at an unnamed tributary of the Tawhiti Stream and an unnamed coastal stream.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The $SQMCI_S$ takes into account taxa abundances as well as sensitivity to pollution. It may indicate subtle changes in communities, and therefore be the more relevant index if non-organic

impacts are occurring. Significant differences in either the MCI or the $SQMCI_S$ between sites indicate the degree of adverse effects (if any) of the discharges being monitored. The presence of masses of heterotrophic organisms can be an indicator of organic enrichment within a stream.

In the unnamed tributary of the Tangahoe River, the macroinvertebrate communities present at the three sites were of 'poor' quality at the time of the survey. The MCI scores recorded were typical for all three sites, however site 2 recorded an MCI score equivalent to the highest score recorded at this site to date. There were no significant changes in MCI scores between the current survey and historical medians. The MCI score significantly increased between the current and previous survey at site 1 and substantially increased at site 2. However, site 3 recorded a significant (Stark, 1998) decrease in MCI score between the current and previous survey. There were substantial improvements in $SQMCI_S$ scores from historical medians at sites 2 and 3, while site 1 recorded a $SQMCI_S$ score slightly lower than the historical median. Site 1 recorded improvements to all three macroinvertebrate indices from the previous survey and showed an improvement to macroinvertebrate community health from the previous four surveys. However, it is recommended that spring and summer biomonitoring continue should there be a return to less favourable results.

The results of this October 2018 survey of an unnamed tributary of the Tangahoe River indicated that stormwater discharges from the factory had not had recent detrimental effects upon the streambed macroinvertebrate communities. The observations made during the biological inspections of the unnamed coastal stream and an unnamed tributary of the Tawhiti Stream also indicated that preceding discharges from the factory had not had significant adverse effects on the macroinvertebrate communities of these streams.

Copies of biological inspection reports for these sites are available from the Council upon request.

2.2.3.3 Freshwater biomonitoring (summer survey)

The Council collected streambed macroinvertebrates from six sites in tributaries of the Tawhiti Stream (two sites), Tangahoe River (three sites) and an unnamed coastal stream (one site), to investigate the effects of the Fonterra Whareroa dairy factory stormwater discharge on macroinvertebrate health. Macroinvertebrates were identified and the number of different types of taxa counted (taxa richness), and MCI and SQMCI scores were calculated for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of nutrient pollution in streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to pollution. The SQMCI takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities. Significant differences in either the MCI or the SQMCI between sites indicate the degree of adverse effects (if any) of the discharges being monitored and enable the overall health of the macroinvertebrate communities to be determined.

The MCI scores categorised sites B1 and B2 in the unnamed tributary of the Tawhiti Stream as having 'poor' health, which is expected for these sites due to habitat. There were no significant differences between the two sites for any of the three macroinvertebrate indices measured. There was no evidence that discharges into the unnamed tributary of the Tawhiti Stream were causing detrimental impacts on the macroinvertebrate communities at site B1 or site B2.

The MCI scores categorised sites 1 and 2 in the unnamed tributary of the Tangahoe River as having 'poor' health and site 3 as having 'fair' health. The MCI and SQMCI scores recorded at site 1 were both similar to the historical medians for the site, while the MCI and SQMCI scores recorded at sites 2 and 3 were both significantly higher than historical medians. Site 1 in particular recorded substantial improvements to macroinvertebrate metrics from the previous summer 2018 survey, which recorded the lowest taxa richness, MCI and SQMCI scores for the site to date. The results of this survey of an unnamed tributary of the Tangahoe River indicated that stormwater discharges from the factory had not had recent detrimental effects upon the streambed macroinvertebrate communities.

The MCI score categorised site S2 in the unnamed coastal stream as having 'fair' health. This score was higher than the median for the site but represented a further decline in MCI score that has been recorded over the past four surveys. However, there was no evidence that discharges into the unnamed coastal stream were causing detrimental impacts on the macroinvertebrate communities of this stream.

Overall, these results indicate that the Fonterra Whareroa dairy factory stormwater discharge had not negatively affected macroinvertebrate communities of the unnamed tributary of the Tawhiti Stream, the unnamed tributary of the Tangahoe River or the unnamed coastal stream.

Copies of biomonitoring reports for this site are available from the Council upon request.

2.2.3.4 Fish survey

The Tawhiti Stream was not due to be surveyed for fish during the period under review. This is next scheduled for the 2019-2020 monitoring year.

2.2.4 Wastewater

Since June 1997, wastewater from the Whareroa dairy complex has been discharged through a 1,845 m long marine outfall. Previously, the wastewater was discharged at the low water mark.

A discharge of up to 40,000 m^3/day of dairy factory wastewater is provided for by consent 1450. Changes to the consent in September 2006 added specific limits on the concentrations of fats, suspended solids and COD. The consent also controls the environmental effects of the discharge by narrative standards placed on the effects of the discharge at the boundary of a mixing zone. No discharge of raw or treated milk, or milk products, cream, whey or whey permeate is allowed, except under emergency provisions defined in a contingency plan.

Remedial measures undertaken to reduce wastewater in recent years have included: an increased level of resourcing in loss monitoring/CIP optimisation personnel, the installation of a second grade water system that reuses up to 3,000,000 L/day of water, and a chemical recovery extension to the nitric acid cleaning system.

Over recent monitoring years, video surveillance has found that the new, long outfall is performing according to design. The effluent field that forms above the diffuser moves parallel to the coast, and has not been observed to impinge upon the shore under standard conditions.

Although occasional surface films form, there has been no evidence of accumulation of material on the seabed near the outfall.

2.2.4.1 Discharge composite samples

Fonterra forwards monitoring results to the Council monthly. These results include daily discharge volumes, as well as the concentrations of fats and suspended solids, COD, pH and mean daily temperature of the discharge. The chemical measurements are based on 24 hour time-proportioned composite samples. A summary of wastewater volume data for the period under review is provided in Table 8.

Table 8 Summary of wastewater volume data for 2018-2019

Month	Mean volume (m^3/day)	Maximum volume (m^3/day)	No. of non-compliance days (> 40,000 m^3/day)
July	5,705	11,393	0
August	16,159	22,543	0
September	25,572	28,217	0

Month	Mean volume (m^3/day)	Maximum volume (m^3/day)	No. of non-compliance days (> 40,000 m^3/day)
October	28,064	30,877	0
November	27,270	29,424	0
December	25,508	28,245	0
January	23,785	27,419	0
February	22,789	25,236	0
March	19,529	23,799	0
April	18,294	27,513	0
May	11,545	15,249	0
June	2,814	8,126	0

The highest maximum daily volume discharged was 30,877 m^3, on 29 October 2018. October 2018 had the highest average daily volume discharged (28,064 m^3), coinciding with the period of highest processing throughput. As with the previous eight monitoring periods, the maximum allowable discharge rate of 40,000 m^3/day was not exceeded.

Daily discharge volumes for the 2018-2019 monitoring period are presented in Figure 2. The wastewater composition discharged through the outfall in terms of daily values for suspended solids, COD and fat concentrations, as supplied by Fonterra, is shown in Figures 3 to 5 and summarised in Table 9 and Table 10.

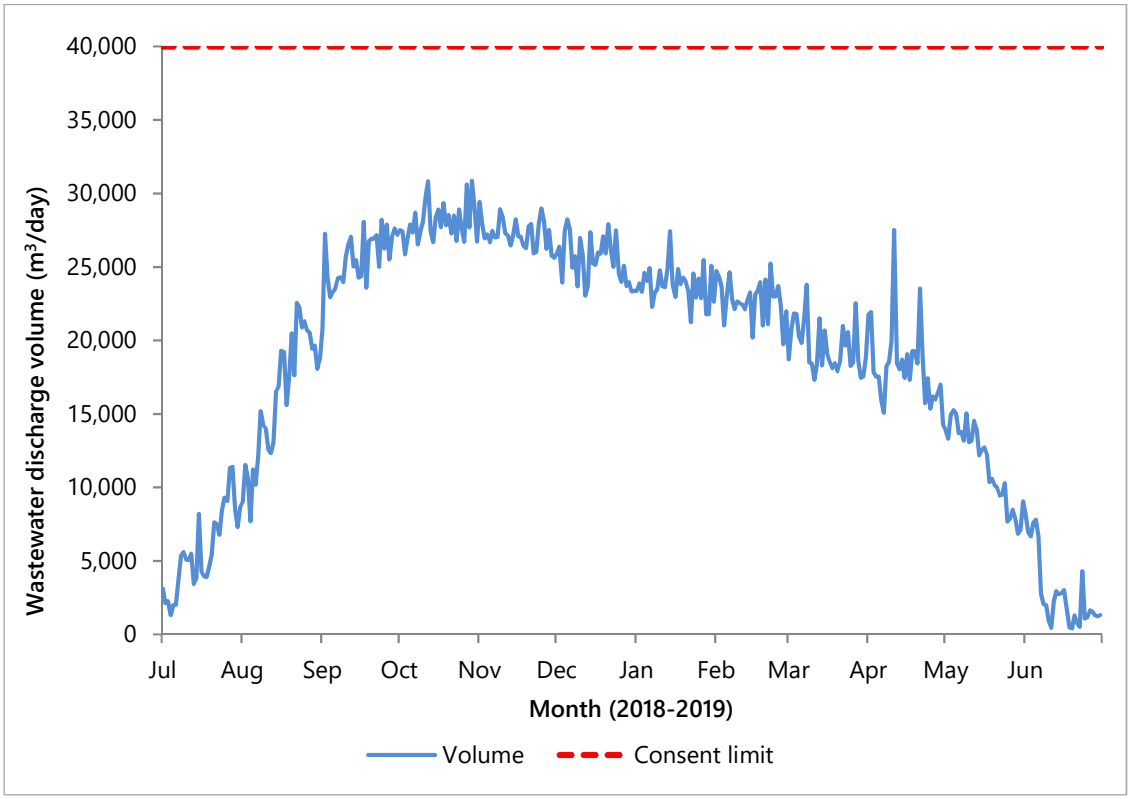

Figure 2 Daily volumes of wastewater discharged through the ocean outfall

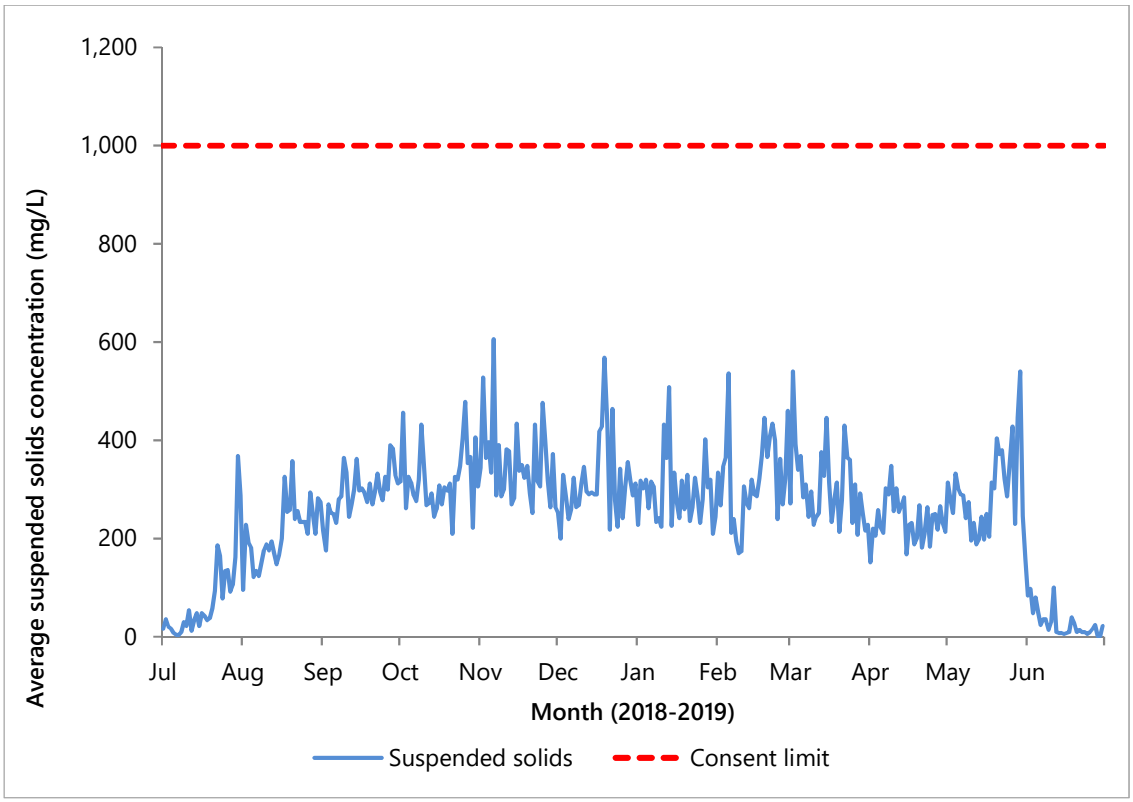

Figure 3 Daily, average concentrations of suspended solids in wastewater discharge, based on 24 hour time-proportioned composite samples

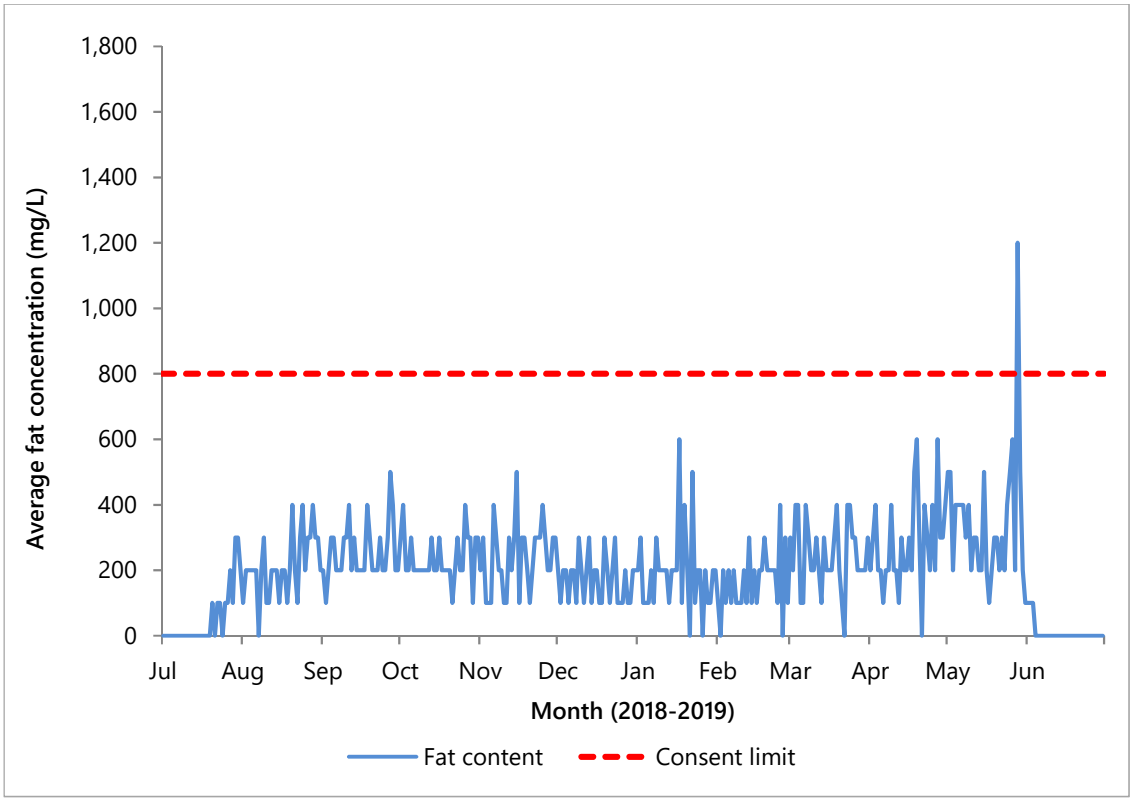

Figure 4 Daily, average concentrations of fats in wastewater discharge, based on 24 hour time-proportioned composite samples

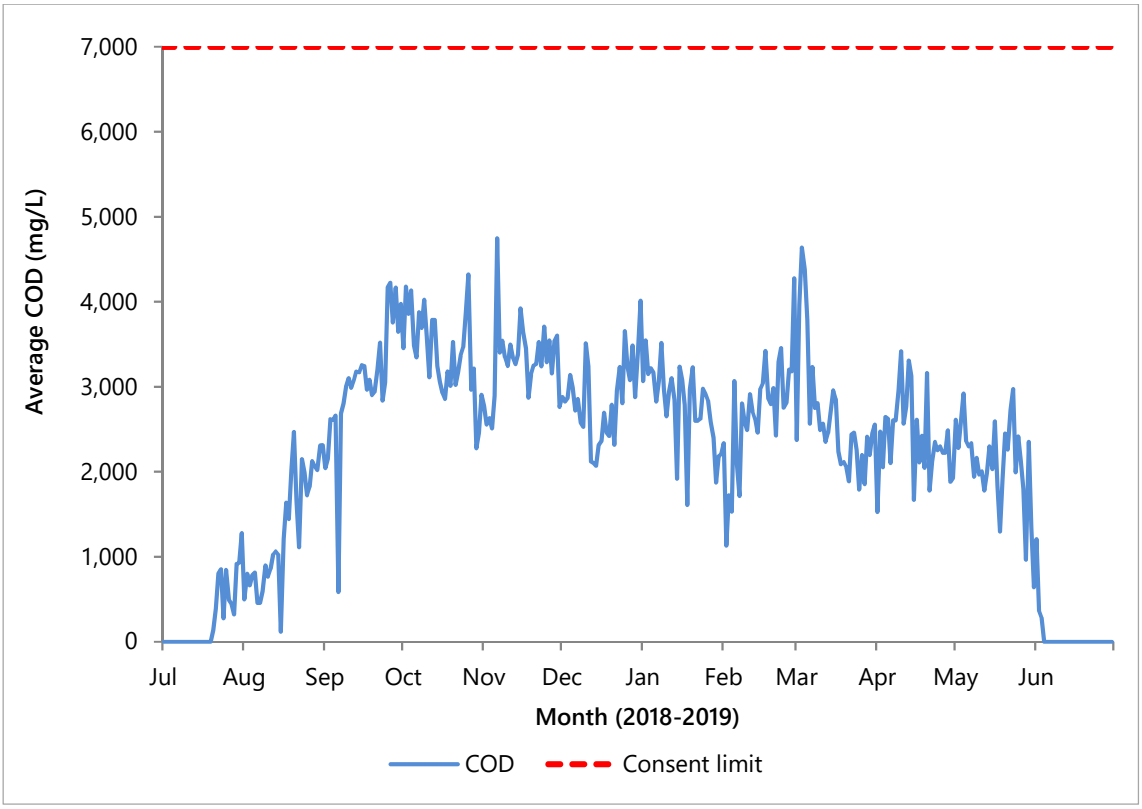

Figure 5 Daily, average COD in wastewater discharge, based on 24 hour time-proportioned composite samples

It should be noted that these data relate to 24 hour time-proportioned samples, and therefore represent daily average values. The Council analysed three 24 hour time-proportioned samples taken from the discharge of this wastewater and these results are presented in Section 2.2.5.3 (Table 12).

The daily discharge volumes, average suspended solids, and average concentrations of COD complied with consent conditions during the entire monitoring period (Figures 2, 3 & 5; Table 9). The average fat concentration exceeded the consent limit on one occasion during the monitoring year (Figure 4).

Table 9 Summary of daily wastewater discharge composition data (2018-2019)

Month	Suspended solids concentration			Fat concentration			COD		
	Mean (mg/L)	Max (mg/L)	Breach days	Mean (mg/L)	Max (mg/L)	Breach days	Mean (mg/L)	Max (mg/L)	Breach days
July	76	368	0	100	300	0	640	1,277	0
August	219	400	0	200	400	0	1,319	2,467	0
September	294	390	0	253	500	0	3,054	4,225	0
October	320	478	0	200	400	0	3,393	4,323	0
November	354	606	0	200	500	0	3,302	4,747	0
December	314	568	0	200	300	0	2,857	4,014	0
January	295	508	0	200	600	0	2,797	3,546	0
February	321	536	0	200	400	0	2,701	1,130	0
March	305	540	0	200	400	0	2,642	4,636	0

Month	Suspended solids concentration			Fat concentration			COD		
	Mean (mg/L)	Max (mg/L)	Breach days	Mean (mg/L)	Max (mg/L)	Breach days	Mean (mg/L)	Max (mg/L)	Breach days
April	237	348	0	300	600	0	2,412	3,418	0
May	293	540	0	300	1200	**1**	2,106	2,972	0
June	28	100	0	0	100	0	62	1,208	0
Consent limit	**≤ 1,000**			**≤ 800**			**≤ 7,000**		
Total no. of breach days	0			1			0		

For the 2018-2019 monitoring year, 6,811,370 m^3 of wastewater was discharged through the outfall, a decrease from the previous monitoring period when 7,321,210 m^3 was discharged (Table 10). The estimated total mass of suspended solids, fats, and COD in the wastewater discharged during the monitoring year under review all decreased compared to the previous monitoring period.

The volumes of wastewater and masses of contaminants discharged over the past five years have fluctuated in response to changing volumes of milk production. However, the average concentrations of constituents in the wastewater have remained relatively stable over this period. In the 2018-2019 monitoring period, the average concentrations of suspended solids, fats, and COD decreased, in comparison with the previous monitoring year.

Table 10 Summary of estimated annual total masses and average concentrations of wastewater discharge constituents over the past five monitoring years, for the 11-month dairy season (July-May)

Monitoring year	Volume discharged (m^3)	Suspended solids		Fat		COD	
		Estimated total mass (tonnes)	Average mg/L	Estimated total mass (tonnes)	Average mg/L	Estimated total mass (tonnes)	Average mg/L
2014-15	8,398,543	3,997	480	2,220	270	24,797	2,914
2015-16	8,187,622	3,677	517	2,410	297	19,829	2,422
2016-17	7,663,420	2,265	280	1,671	222	19,661	2,582
2017-18	7,321,210	2,410	283	1,741	246	19,555	2,447
2018-19	6,811,370	2,011	274	1,523	213	18,541	2,360

2.2.4.2 Discharge grab samples

Grab samples of the wastewater, prior to discharge through the Fonterra outfall, were collected by the Council on 10 occasions during the 2018-2019 dairy season (Table 11). These samples were analysed for temperature, COD, conductivity, pH, suspended solids, oil and grease (O & G), *E. coli* and enterococci bacteria.

The main purpose of collecting the grab samples was to measure the microbiological quality of the discharge, which cannot be undertaken on 24-hour composite samples. These results also allow an assessment of the range of effluent component concentrations, rather than the 'average' results that are produced by composite samples.

Table 11 Results of wastewater grab sample analyses for 2018-2019

Parameter	COD	Conductivity	*E. coli*	Enterococci	pH	SS	Temp.	O & G
Unit	**g/m³**	**µS/cm @ 25°C**	**cfu/100ml**	**cfu/100ml**	**pH**	**g/m³**	**°C**	**g/m³**
Summary statistics (July 2009 to June 2019)								
Minimum	50	288	0.5	2	2.1	12	16	11
Maximum	8,320	9360	110,000	8,500,000	12.5	2,000	41	730
Median	1935	2020	80	82,300	10.9	280	30.85	115
2018-2019 monitoring results								
16 Aug 2018	940	1725	2	12,000	11.8	145	26.8	167
13 Sep 2018	2,600	4720	10	28,000	11.9	460	30.9	310
18 Oct 2018	1,740	1622	2,600	2,000	6.8	55	30.8	30
21 Nov 2018	3,700	1496	1,700	490,000	5.8	460	29.2	150
18 Dec 2018	1,440	1496	22,000	6,200,000	8.3	187	31.3	86
16 Jan 2019	2,000	2780	5,400	36,000	6.9	148	32.2	115
20 Feb 2019	2,400	2000	4,600	290,000	8.7	380	33.4	240
28 Mar 2019	2,200	4920	18	10	12.4	210	34.9	450
17 Apr 2019	1,150	1825	94,000	1,000,000	8.1	113	23.6	92
22 May 2019	3,500	9360	2	1,000	12.5	490	31.3	490

High concentrations of faecal indicator bacteria, in particular enterococci, were recorded in the grab samples (Table 11). The discharge of domestic wastes in the dairy wastewater itself is specifically prohibited, and this condition was complied with. It is not unusual for high numbers of faecal indicator bacteria to be found in dairy factory wastewater in the absence of domestic wastes, as has been found elsewhere in the country e.g. at Clandeboye and Westland Milk Hokitika (Palliser *et al.*, 2013 and referenced therein). In order to determine whether elevated numbers of faecal indicator bacteria in the wastewater occur as a result of faecal contamination (e.g. from birds and rodents) or growth of environmental strains, further testing of waste streams is currently being undertaken by Fonterra.

In most grab samples, enterococci counts were notably higher than those for *E. coli.* Enterococci are more tolerant of extreme growth conditions than faecal coliforms (including *E. coli*), with the high temperatures and variable pH occurring in the wastewater potentially depressing the growth of the latter (Palliser *et al.*, 2013). Accordingly, the relatively high *E. coli* count recorded for the sample collected on 17 April 2019 may be attributed to the cooler temperature of the sample. While wastewater temperatures mostly remained in the range of previous results, the sample collected on 17 April 2019 was 6.4°C colder than the historical median for the past 10 years. This was most likely attributed to a downturn in site activity at the time.

COD and suspended solids concentrations were below the consent limits associated with Fonterra's composite sampling programme and were comparable with historical median results. Likewise, wastewater oil and grease concentrations were within the range of previous results. As is often seen in the grab samples, wastewater pH levels fluctuated about the historical median during the monitoring period. The grab sample pH was found to be particularly high in March and May 2019, with the May result matching the historical maximum.

2.2.4.3 Discharge inter-laboratory comparisons

An inter-laboratory comparison was performed on three occasions during the 2018-2019 monitoring period on the 24 hour time-proportioned samples taken from the wastewater discharge. The results obtained by both laboratories are presented in Table 12.

Table 12 includes an agreements column which summarises the acceptability of the difference in each result for the two laboratories. Differences of less than 10% of the mean of the two values are considered acceptable. Differences of 10-25% are considered to constitute a difference between the two laboratories and differences of greater than 25% are considered significantly different.

Table 12 Inter-laboratory comparisons performed on 24 hour composite wastewater samples (2018-2019)

Parameter	Unit	18 September 2018			18 December 2018			28 March 2019		
		Council	Fonterra	Agree	Council	Fonterra	Agree	Council	Fonterra	Agree
COD	g/m^3	2,100	3,084	**	2,600	2,461	✓	1,330	2,413	**
pH	pH	11.2	11.1	✓	9.0	9.7	✓	6.4	10.9	**
Suspended solids	g/m^3	230	274	*	420	428	✓	280	292	✓

Note: ✓ = acceptable agreement

* = within 10% - 25% difference from the mean

** = significantly different (i.e. > 25% difference from the mean)

In September 2018 COD concentrations and suspended solids varied between the Council and Fonterra analyses. In December 2018 the samples analysed by the Council and Fonterra were found to be in acceptable agreement. In March 2019 COD concentration and pH varied significantly between the Council and Fonterra sample analyses.

It is possible that the differences observed between these sets of results may be related to the differences in analysis timeframes, given that the Council's set of samples are analysed one day later than those of Fonterra. However, this should not account for the magnitude of disagreement seen here. These differences have been raised with Fonterra to understand whether other factors, for example sampling methodology, may be affecting the results.

2.2.4.4 Marine ecological surveys

In order to assess the effects of the Fonterra dairy factory and Hawera Wastewater Treatment Plant combined outfall discharge on the nearby intertidal communities, a spring survey was conducted in November 2018 (peak season) at four sites, and a summer survey was carried out in February-March 2019 (post-peak season) at three sites (Figure 6). The surveys included three potential impact sites either side of the outfall (two southeast and one northwest) and one control site (further northwest). It was expected that adverse effects of the marine outfall discharge on the intertidal communities would have been evident as a significant decline in species richness and diversity at the potential impact sites, relative to the control site. The main findings of these survey reports are summarised below, and are presented in Figures 7 to 10.

Figure 6 Map of sampling sites in relation to the outfall

Compared with the previous spring survey, the results from the 2018 spring survey shows an increase in the mean number of species recorded at all four survey sites, most notably at the 350 m NW and 200 m SE sites (Figure 7). Increases in mean Shannon-Weiner indices were also recorded for all sites except Pukeroa Reef, where there was a slight decrease (Figure 8). The results of the 2019 summer survey showed a slight increase in the mean number of species and the Shannon-Weiner index at all sites, except for a slight decrease in the mean number of species found at the 200 m SE site (Figure 9, Figure 10). There is no evidence of the potential impact sites declining in species richness or diversity over time, relative to the control site.

Overall, neither survey provided evidence to suggest that the outfall was having any adverse effects on the intertidal reef communities of South Taranaki. Natural environmental factors, including coastal erosion, exposure and substrate mobility, appear to remain the dominant drivers of species richness and diversity at the sites surveyed.

Copies of these intertidal ecological survey reports are available from the Council upon request.

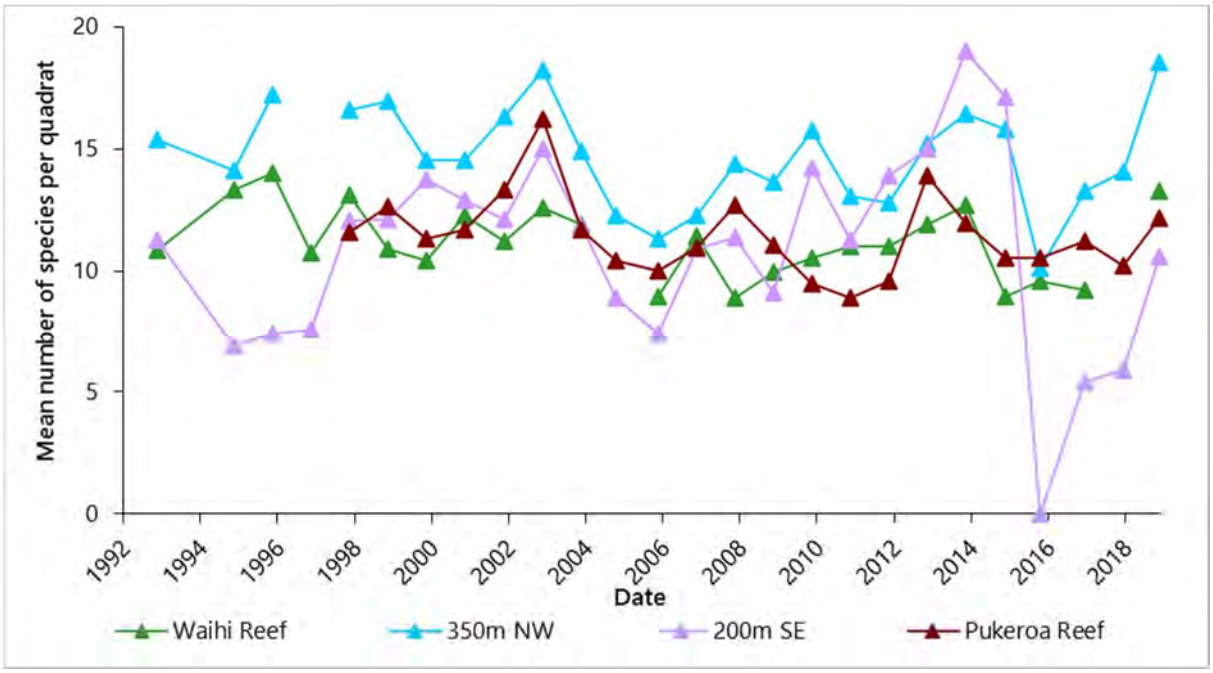

Figure 7 Mean number of species per quadrat for spring surveys (1992-2018)

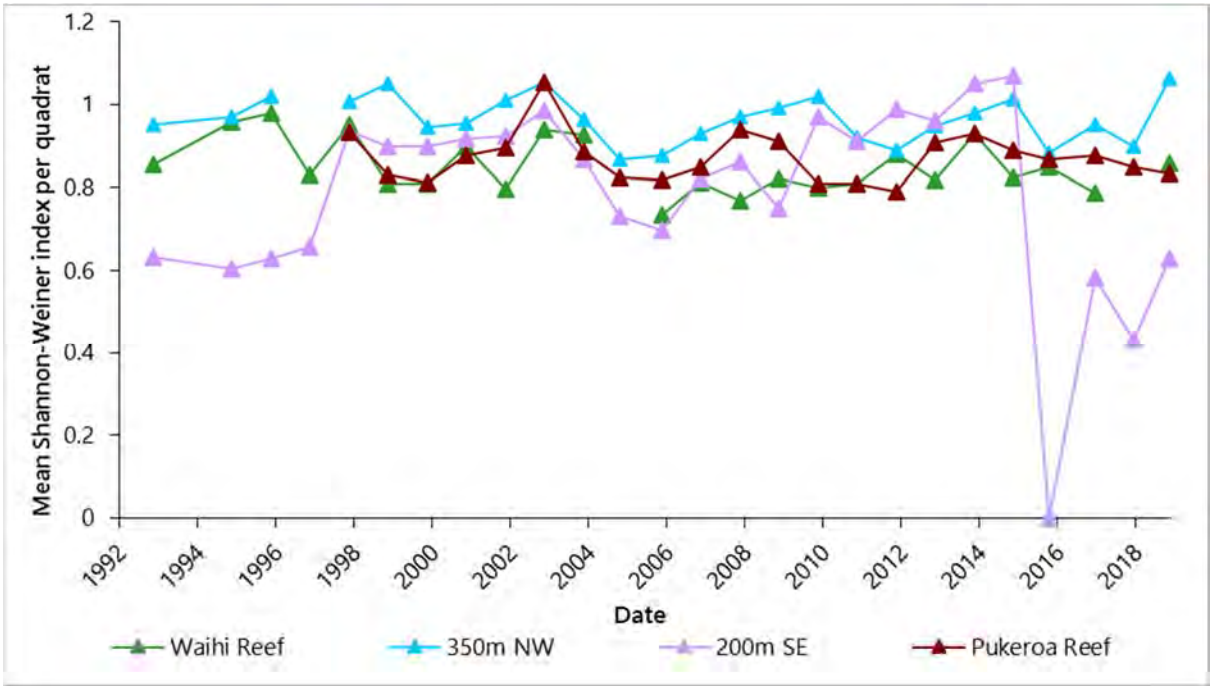

Figure 8 Mean Shannon-Weiner indices per quadrat for spring surveys (1992-2018)

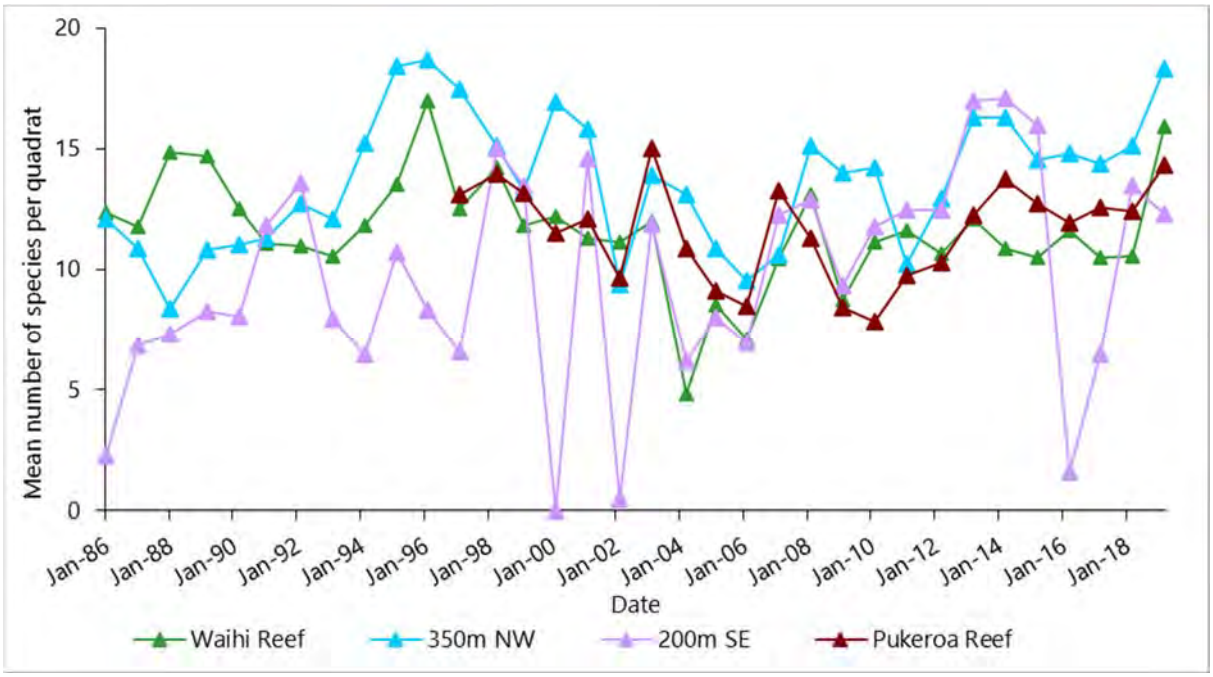

Figure 9 Mean number of species per quadrat for summer surveys (1986-2019)

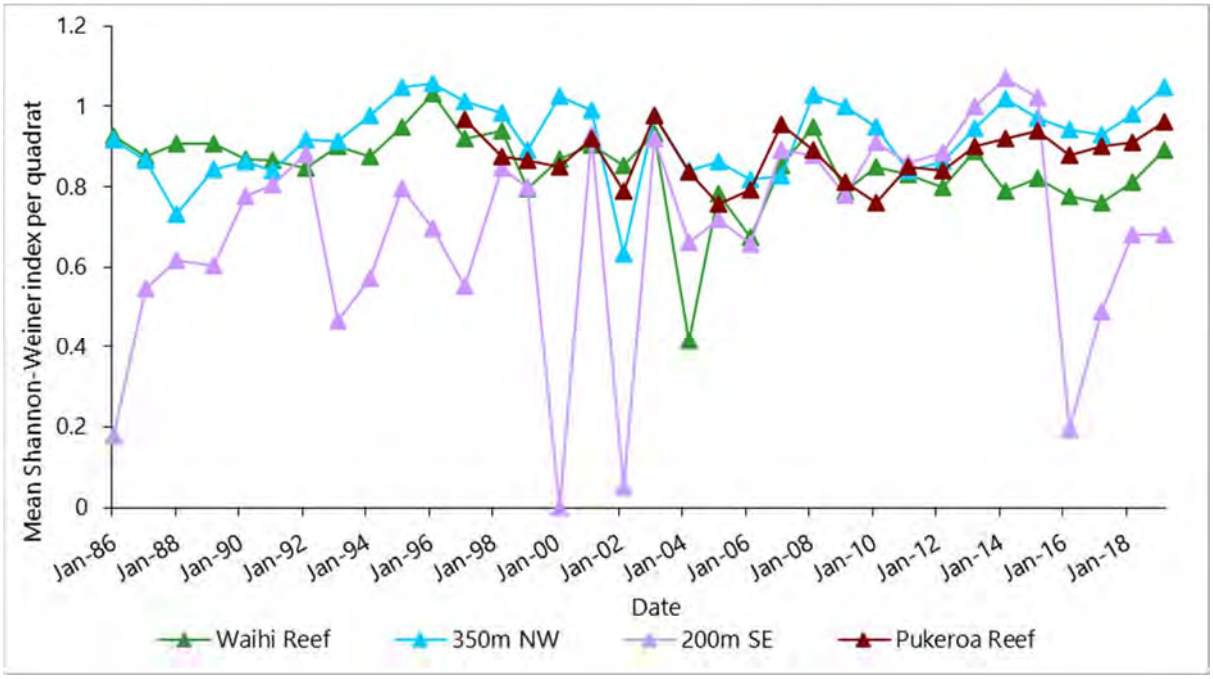

Figure 10 Mean Shannon-Weiner Indices per quadrat for summer surveys (1986-2019)

2.3 Air

2.3.1 Inspections

During each monthly site visit, a good standard of housekeeping was observed and no unusual emissions to air were noticed. Milk odour was occasionally noted around the site, but the odour was never objectionable or offensive and it was not detected beyond the boundaries of the site. Onsite milk powder deposition ranged from negligible to high over the monitoring period. An unusual, offensive odour was detected in the vicinity of the truck wash on one occasion but was not detected during any other inspection.

2.3.2 Emission source analysis

Consent 4103-2.3 limits powder emissions to the atmosphere from the spray drying process cyclone exhausts to 125 mg/m^3. A separate limit is in place for Powder-3, whereby powder emissions from this facility shall not exceed 150 mg/m^3.

Fonterra's independent consultants, CRL Energy Ltd, carried out powder emission measurements on drier exhaust stacks (Powders 2, 3, 4, 5, whey products, and casein) between September 2018 and March 2019. These results are presented in Table 13. All results for Powder-3 are presented separately in Table 14. Powder-1 is no longer in use and has been removed from resource consent 4103.

Table 13 Emission source analysis results for 2018-2019 (special condition 7)

Date	Plant		Emission concentration (mg/m^3 0°C, 1 atm, dry gas)	Emission control
5 September 2018	WPC drier	Exhaust	1	Baghouse
1 November 2018	Alamin	Exhaust	1	Baghouse
	Casein	Drier stack 1	29	Dual cyclones
4 December 2018		Drier stack 2	23	Dual cyclones
	Powder-2	Exhaust	2	Baghouse
	Powder-4*	North stack	-	-
		South stack	-	-
		Wet scrubber	8	Wet scrubber
1 February 2019	Powder-5	North stack	31	Dual cyclones
		South stack	27	Dual cyclones
		East stack	84	Dual cyclones
		West stack	99	Dual cyclones
Consent limit		125		

* North and South stacks not operating at time of testing. These stacks are used when drying milk protein concentrate and the wet scrubber is used when drying skim milk powder.

Table 14 Emission source analysis results for 2018-2019 (special condition 8)

Date	Plant (product)		Emission concentration (mg/m^3 0°C, 1 atm, dry gas)	Emission control
5 September 2018	Powder-3 (whole milk powder)	East Stack	30	Cyclone
		West stack	28	
		Fluid Bed Exhaust	24	
30 January 2019	Powder-3 (high fat whey)	East Stack	130	
		West stack	**150**	
		Fluid Bed Exhaust	**155**	
31 January 2019	Powder-3 (buttermilk)	East Stack	109	
		West stack	**156**	
		Fluid Bed Exhaust	**171**	
13 February 2019	Powder-3 (high fat whey)	East Stack	**174**	
		West stack	140	
		Fluid Bed Exhaust	143	
14 February 2019	Powder-3 (buttermilk)	East Stack	**191**	
		West stack	**208**	
		Fluid Bed Exhaust	**225**	
22 February 2019	Powder-3 (buttermilk)	East Stack	61	
		West stack	68	
		Fluid Bed Exhaust	76	
25 February 2019	Powder-3 (buttermilk)	East Stack	62	
		West stack	92	
		Fluid Bed Exhaust	70	
26 February 2019	Powder-3 (buttermilk)	East Stack	66	
		West stack	65	
		Fluid Bed Exhaust	68	
1 March 2019	Powder-3 (buttermilk)	East Stack	59	
		West stack	62	
		Fluid Bed Exhaust	79	
25 March 2019	Powder-3 (high fat whey)	East Stack	126	
		West stack	125	
		Fluid Bed Exhaust	58	
26 March 2019	Powder-3 (high fat whey)	East Stack	104	
		West stack	111	
		Fluid Bed Exhaust	81	
27 March 2019	Powder-3 (high fat whey)	East Stack	107	
		West stack	100	
		Fluid Bed Exhaust	69	

Date	Plant (product)		Emission concentration (mg/m^3 0°C, 1 atm, dry gas)	Emission control
28 March 2019	Powder-3 (whole milk powder)	East Stack	32	
		West stack	42	
		Fluid Bed Exhaust	8	
Consent limit			150	

Aside from Powder-3, the results from all of the driers were well below the emissions concentration limit based on the testing that was undertaken (Table 13, Table 14). High results were initially recorded for two products at Powder-3 on January 30 and 31, when trials were carried out with high fat whey and buttermilk. Following these initial non-compliances, a further ten stack tests were carried out over the following six weeks. Non-compliant results were recorded over a total of four drying runs, the last of which occurred on 14 February 2019. Emission concentrations for each product reduced considerably over this period as the process was optimized and operational controls were improved.

2.3.3 Deposition gauging

Many industries emit dust from various sources during operational periods. In order to assess the effects of the emitted dust, industries are monitored using deposition gauges.

Deposition gauges are modified buckets, elevated on a stand to approximately 1.6 m. The buckets contain deionised water to ensure that any dust that settles out of the air is not re-suspended by wind. A copper sulphate solution at a concentration of 5 g/L acts as a preservative to prevent the growth of algae and bacteria.

Deposition gauges were deployed at five sampling sites on six occasions around the Whareroa site for periods of approximately three weeks, between August and December 2018. The contents of the gauges were analysed for COD. The COD results are compared with the theoretical COD value for dry milk powder and a "total deposited milk powder" (TDMP) value is calculated.

The locations of the five air deposition monitoring sites are provided in Figure 11.

Figure 11 Location of air deposition sites

TDMP values for each monitoring site are presented in Table 15. The Council's nuisance guideline value for total deposited particulate is 130 mg/m^2/day. The Council does not have a specific guideline value for milk powder deposition. The Fonterra deposition survey determines deposition due to milk powder only, rather than total deposition.

Table 15 Total deposited milk powder values (mg/m^2/day) for each monitoring site during 2018

Site ID	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6
	1 August to 22 August	22 August to 14 September	14 September to 15 October	15 October to 2 November	2 November to 26 November	26 November to 17 December
AIR002409	**193.40**	**190.17**	**320.43**	**418.49**	**255.14**	**256.22**
AIR002416	17.36	102.63	104.36	**156.93**	**143.19**	124.97
AIR002422	19.34	88.75	78.11	18.02	111.08	**223.16**
AIR002424	**198.36**	9.96	81.00	16.86	97.20	**398.05**
AIR002426	18.84	10.41	66.76	18.60	125.55	**181.83**
Council guideline	**130 mg/m^2/day**					

As expected, the highest TDMP values were recorded at the staff car park entrance (AIR002409) throughout the duration of the monitoring period (Table 15; Figure 12). This is the closest site to the powder drying facilities and is where previous monitoring results have typically been the highest. At the corner of Manawapou Road and Whareroa Road (AIR002416), two slightly elevated results were recorded both at the beginning, and at the end of November. The two high results recorded at the sampling site near the corner of Whareroa Road and South Road are indicative of potential contamination from local sources (e.g. vegetation, insects, fertilizer), given the comparatively low deposition values from the remaining sites following those runs. Deposition values exceeded 130 mg/m^2/day at four out of five sites during the final run between 26 November and 17 December 2018. Wind direction was highly variable during this period, which may help explain why deposition was elevated at all monitoring sites surrounding the factory. However, these results were recorded later than peak milk powder production, which is typically from October to November (as demonstrated at AIR002409 which recorded the highest result of the year on 2 November).

Overall, with the exception of the final monitoring run, the results indicate that the majority of the powder fallout occurred in the immediate vicinity of the powder plants and did not extend far beyond the site boundaries. Deposition of milk powder on the site is not of great environmental concern, provided that the stormwater management systems perform satisfactorily. The elevated results are discussed further in Section 3.2.4.

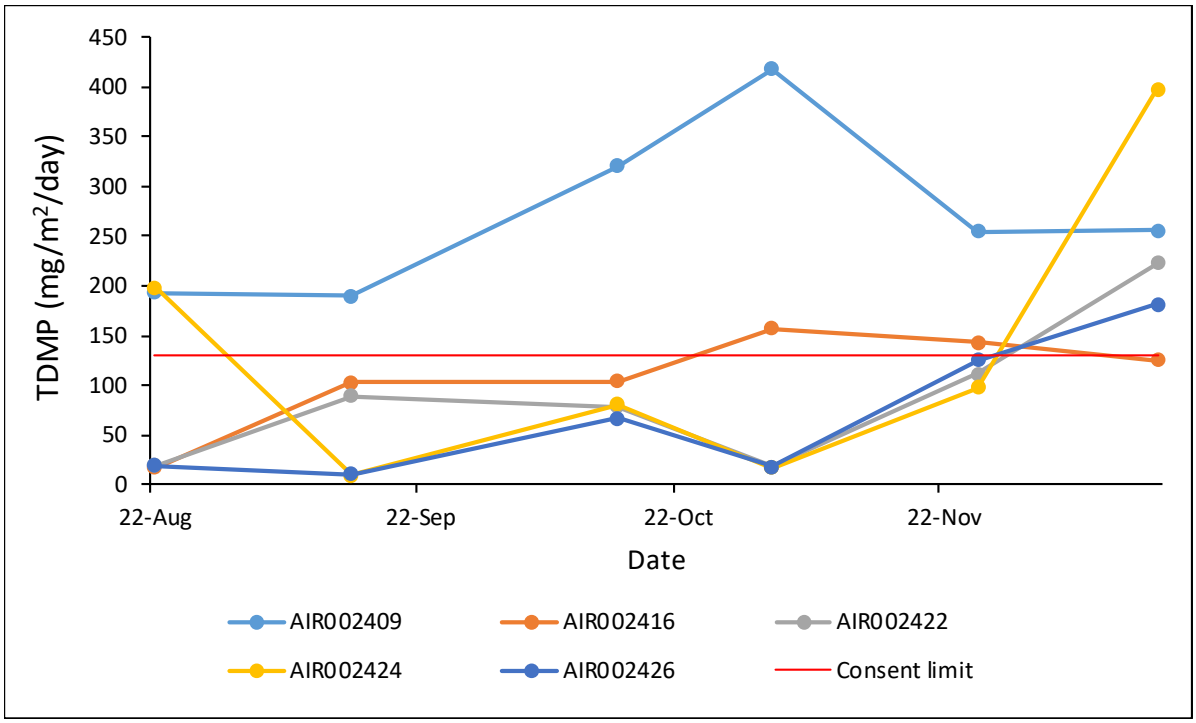

Figure 12 Milk powder fallout at air deposition sites surrounding Whareroa (August to December 2018)

2.3.4 Inhalable particulate (PM_{10}) monitoring

Special condition 10 of consent 4103 sets a limit on the emissions of PM_{10} to the atmosphere from the site to a maximum of 50 µg/m³ (24 hour average).

During the reporting period, a "DustTrak" PM_{10} monitor was deployed on two occasions in the vicinity of the dairy complex. The deployments lasted from approximately 33 to 34 hours, with the instrument placed in a down-wind position at the start of the deployment. Monitoring consisted of continual measurements of PM_{10} concentrations. The results from the sampling runs are shown in Figure 13.

During the first 34-hour run, from 3 to 5 September 2018, the average recorded PM_{10} concentrations for the first and second 24-hour periods were 7.9 µg/m³ and 7.8 µg/m³, respectively. These daily means equate to 15.8% and 15.6%, respectively, of the 50 µg/m³ value that is set by both the National Environmental Standard and the resource consent.

During the second 33-hour run, from 5 to 7 October 2018, the average recorded PM_{10} concentrations for the first and second 24-hour periods were 6.8 µg/m³ and 7.6 µg/m³, respectively. These daily means equate to 13.6% and 15.2%, respectively, of the 50 µg/m³ value that is set by both the National Environmental Standard and the resource consent.

The regional background PM_{10} level has been determined to be approximately 11 µg/m³.

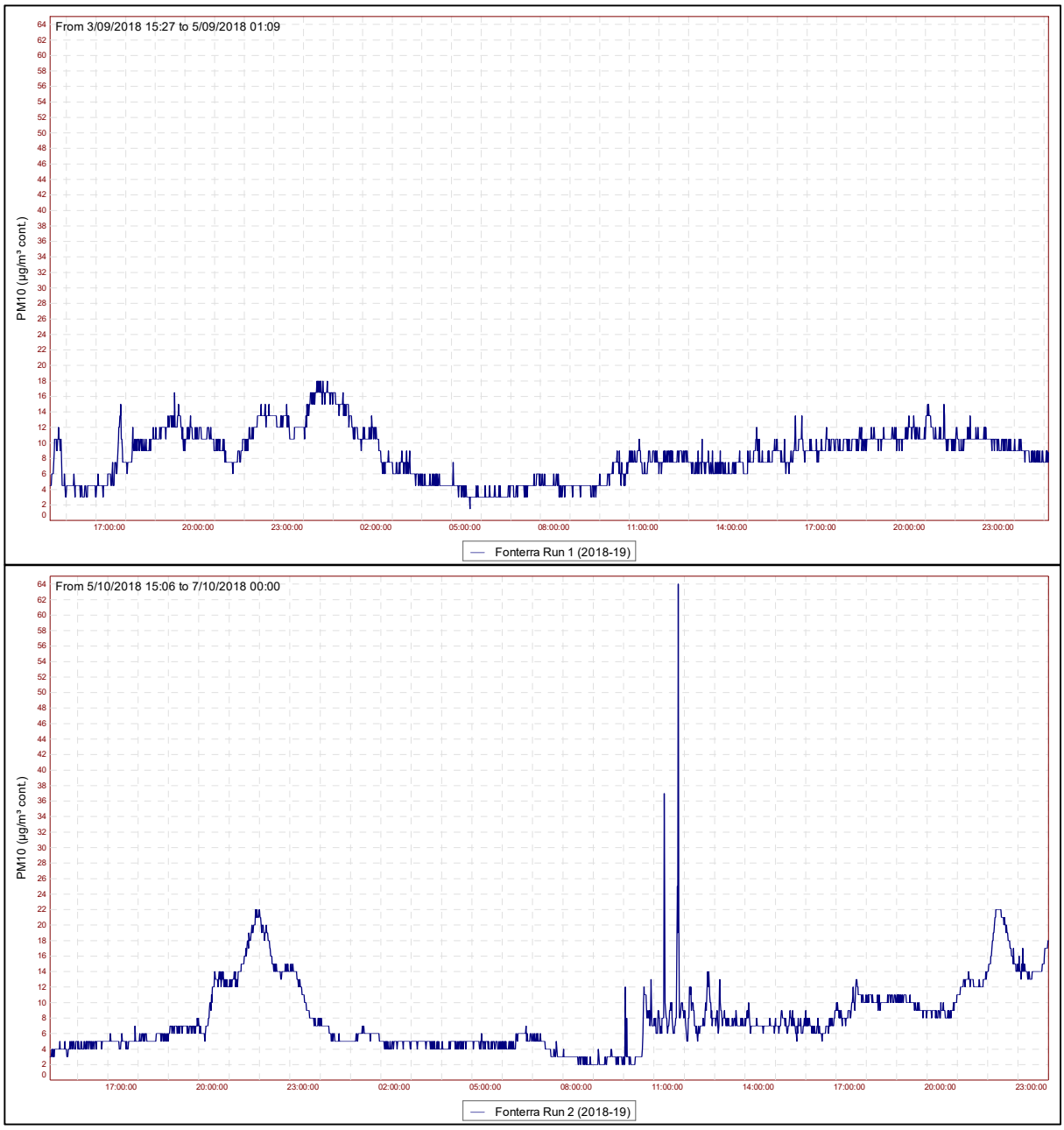

Figure 13 PM_{10} concentrations (µg/m^3) at the Whareroa dairy complex

Copies of PM_{10} monitoring reports for the Whareroa site are available from the Council upon request.

2.3.5 Nitrogen oxide (NO_x) monitoring

Ambient NO_x monitoring was incorporated into the monitoring programme in 1996-1997, to monitor the effects of the co-generation plant at the site. In October 1997, Fonterra commissioned a second co-generation plant (Co-gen 2) in response to increased milk coming to the site. NO_x is the main emission of concern associated with Fonterra's co-generation plants, from the perspective of potential environmental effects. Special condition 7 of consent 6273 set limits for nitrogen dioxide emissions:

> *"The consent holder shall control all emissions of nitrogen dioxide or its precursors to the atmosphere from the site, so as to ensure that the maximum ground level concentration of nitrogen dioxide measured under ambient conditions does not exceed 200 micrograms per cubic metre [µg/m^3] [one-hour average], or 100 µg/m^3 [twenty-four hour average], at or beyond the boundary of the site."*

The Council uses passive absorption discs to monitor ambient nitrogen dioxide (NO_2). The gases diffuse into the discs and any target gases are captured. These discs are deployed for periods of approximately three weeks and are then sent to an external laboratory for analysis.

Passive NO_x discs were placed in four locations surrounding the Fonterra site (Figure 14) on one occasion during the 2018-2019 monitoring year.

Figure 14 NO_x sample site locations around the Fonterra plant

From the average concentration measured, it is possible to calculate a theoretical maximum daily concentration that may have occurred during the exposure period. There are mathematical equations used by air quality scientists to predict the maximum concentrations over varying time periods. These are somewhat empirical, in that they take little account of factors such as local topography, micro-climates and diurnal variation. Nevertheless, they are applied conservatively and have some recognition of validity.

One formula generally used is:

$$C(t2) = C(t_1) \times (\frac{t_1}{t_2})^P$$

where C(t) = the average concentration during the time interval t, and p = a factor lying between 0.17 and 0.20. When converting from longer time periods to shorter time periods, using p = 0.20 gives the most conservative estimate (i.e. the highest calculated result for time period t2, given a measured concentration for time period t1). Using the 'worst case' factor of p = 0.20, the monitoring data reported above has been converted to equivalent 'maximum' 24 hour exposure levels.

Table 16 presents the actual levels found, theoretical maximum 1 hour and 24 hour concentrations of NO_x, and consent 6273 limits.

Table 16 NO_x levels and theoretical 1 hour and 24 hour maximums for each air monitoring site at Fonterra (2018-2019)

Monitoring period	NO_x concentration µg/m^3											
	AIR002410			AIR002411			AIR002412			AIR002413		
	NOx (Lab)	1 h (Cal)	24 h (Cal)	NOx (Lab)	1 h (Cal)	24 h (Cal)	NOx (Lab)	1 h (Cal)	24 h (Cal)	NOx (Lab)	1 h (Cal)	24 h (Cal)
11/01/2019 – 1/02/2019	11.5	39.9	21.1	5.5	19.1	10.1	4.0	13.9	7.3	4.3	14.9	7.9
Consent limit		**200**	**100**		**200**	**100**		**200**	**100**		**200**	**100**

1 h = 1 hour theoretical maximum

24 h = 24 hour theoretical maximum

Throughout the 2018-2019 monitoring period NO_x concentrations remained well below consent condition limits (consent 6273, special condition 7 – 200 mg/m^3 one hour average, 100 mg/m^3 24 hour average).

Variation in NO_x concentration values can be explained in terms of distance from possible NO_x sources, namely the plant and road traffic, as well as wind speed and direction.

Since 2014, the Council has coordinated a region-wide monitoring programme to measure NO_x, not only at individual compliance monitoring sites near industries that emit NO_x, but simultaneously at urban sites (from the Council's regional state of the environment programme) to determine exposure levels for the general population. The programme involves deploying all measuring devices on the same day, with retrieval three weeks later. This approach enables the Council to further evaluate the effects of local and regional emission sources and ambient air quality in the region.

Figure 15 presents the average NO_x levels (theoretical 1 hour concentrations) from 11 industrial sites monitored around the region from January 2014 to February 2019. The results from Figure 15 show that NO_x levels at Fonterra are comparable with some of the larger production stations around Taranaki.

Copies of regional NO_x monitoring reports are available from the Council upon request.

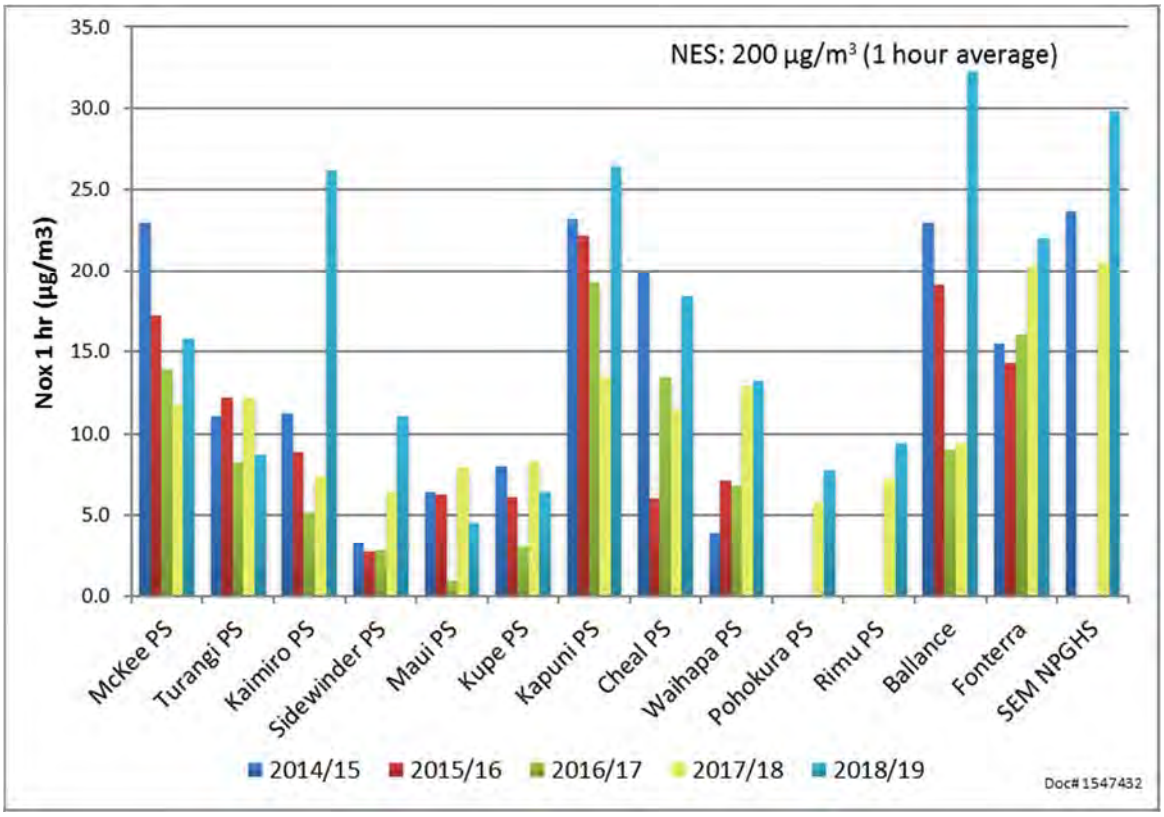

Figure 15 Average NO_x levels at 11 monitored industrial sites throughout the region

2.4 Investigations, interventions, and incidents

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 Fonterra. 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.

The Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The incident register includes events where Fonterra has itself notified the Council. The register contains details of any investigation and corrective action taken.

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 company is indeed the source of the incident (or that the allegation cannot be proven).

Table 17 below sets out details of any incidents recorded, additional investigations, or interventions required by the Council in relation to Fonterra's activities during the 2018-2019 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.

Table 17 Incidents, investigations, and interventions summary table

Date	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
16/01/19	Consent limit breach – oil and grease in western stormwater discharge. Results from routine sampling found that oil and grease concentrations in the western stormwater discharge had exceeded the consent limit (5 g/m^3) for the third time in the monitoring year, constituting a breach of the associated consent condition.	Y	No. Analytical method for oil and grease had changed in the previous monitoring year. New method is more 'sensitive' as it detects a wider range of plant and animal oils, in addition to hydrocarbons. Consent limit was originally intended for Horiba method and was informed by previous monitoring results using this method. Discussed further in Section 3.2.2.	The Council is working with Fonterra to initiate a review of the current consent limit for oil and grease.
30/01/19 31/01/19 13/02/19 14/02/19	Consent limit breach – particulate emissions from Powder-3 drier facility. High particulate emissions were identified through stack testing when drying buttermilk and whey powder in Powder-3.	N	A 14-day letter was issued. Fonterra took necessary steps to ensure consent compliance was achieved. No adverse environmental effects were observed. No further action was taken. Discussed further in Section 3.2.2.	Operating parameters updated for drying products in Powder-3. In-line particulate meters were installed in order to provide an additional means of controlling emissions.
13/03/19	Cleaning of a blocked drier resulting in a possible discharge of milk powder through the marine outfall.	Y	No. Wastewater discharge limits were not exceeded, no visible effects were found on the sea surface above the outfall or on the foreshore at Ohawe beach.	-

Date	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
28/05/19	Consent limit breach – high fat concentration in wastewater. Milk fat spill within cream products plant led to non-compliant wastewater discharging to marine outfall.	N	Yes. Infringement notice issued.	Management of cream sump pump was reviewed. Procedure for responding to cream spills in the cream products plant was also updated to ensure cream spills are managed correctly.

3 Discussion

3.1 Discussion of site performance

3.1.1 Inspections

Routine inspections found the site was compliant with consent conditions throughout the monitoring period. The in-line stormwater monitoring and diversion system, which was commissioned in January 2019, showed promising signs that it would reliably prevent poor quality stormwater from discharging to receiving tributaries. The continuous monitoring system also provides a significant amount of data for Fonterra staff to investigate potential contamination issues. For example, in-line monitoring at the sand filter stormwater sump identified ongoing issues with pH. In response to this, the stormwater from this part of the site has been diverted to containment ponds and the source of contamination has been investigated.

3.1.2 Provision of data

Fonterra provided its self-monitoring data (i.e. abstraction and wastewater volume and composition information) to the Council in a timely manner.

3.1.3 Monitoring and management plans

Resource consents 0047-4 (water abstraction) and 1450-3 (wastewater discharge) contain four special conditions relating to Tangata Whenua Involvement Plans (TWIPs).

0047-4

Condition 12 requires Fonterra to submit to Council a TWIP, developed in consultation with Te Runanga o Ngati Ruanui and Te Korowai o Ngāruahine (collectively referred to as "Tangata Whenua" for the purposes of this consent). Conditions 13, 14 and 15 provide further details around the purpose, processes and requirements of the TWIP.

Two Kaitiaki Group (KG) meetings were held in October and November 2018 and the TWIP was finalised during the year under review.

Conditions 16 and 17 outline Monitoring Plan requirements.

A monitoring regime was developed during the year under review in consultation with Tangata Whenua. The monitoring is to focus on fish and macroinvertebrate communities within the Tangahoe River and Tahwiti Stream, as required by condition 16 (in addition to conditions in resource consents 4927-2 and 5148-2). These surveys will be first trialed in the 2019-2020 monitoring year.

1450-3

Condition 11 requires STDC and Fonterra to submit to Council a TWIP, developed in consultation with Te Runanga o Ngati Ruanui and Te Korowai o Ngāruahine (collectively referred to as "Tangata Whenua" for the purposes of this consent). Conditions 12, 13 and 14 provide further details around the purpose, processes and requirements of the TWIP.

Two Kaitiaki Group (KG) meetings were held in October and November 2018 and the TWIP was finalised during the year under review.

Conditions 15 and 16 outline Monitoring Plan requirements.

In addition to the current monitoring programme, an additional monitoring regime began development during the year under review in consultation with Tangata Whenua. The monitoring is to focus on the

Taonga intertidal species which inhabit Pukeroa Reef, as required by condition 15. The survey will be first trialed in the 2019-2020 monitoring year.

3.2 Environmental effects of exercise of consents

3.2.1 Abstractions

Fonterra were compliant with all water abstraction consent conditions during the year. Maximum daily abstraction volumes weren't exceeded and minimum flows were maintained. There was no monitoring of environmental effects undertaken in 2018-2019, as this work occurs on a triennial basis. Fish and macroinvertebrate surveys are scheduled to be undertaken in the summer of 2019-2020.

3.2.2 Stormwater

Discharge sampling from the Tawhiti, Tangahoe and coastal stormwater ponds was undertaken on ten occasions over the 2018-2019 monitoring year. At the discharge from the Tawhiti ponds, one parameter (oil and grease), exceeded the consent limit on two occasions. As three or more exceedances are required for consent non-compliance, this discharge is deemed to have been compliant throughout 2018-2019. At the discharge from the Tangahoe ponds, two parameters (filtered carbonaceous BOD and oil and grease) exceeded the consent limit on one occasion while another parameter (total chlorine) exceeded the consent limit on two consecutive occasions. No parameters exceeded the consent limit more than twice; therefore this discharge is deemed to have been compliant throughout 2018-2019. At the discharge from the coastal stormwater ponds, two parameters (filtered carbonaceous BOD and total BOD) exceeded the consent limit on one occasion while another parameter (oil and grease) exceeded the consent limit on three occasions. These three exceedances constitute non-compliance with consent 4133-3, condition 7. As was noted in the previous monitoring report, samples have been analysed by an external laboratory since April 2018. As a result of this laboratory change, a different analytical method has been adopted. Technically, the new oil and grease test method (Soxhlet extraction, gravimetric analysis) is more sensitive, as it is able to detect a wider range of plant and animal oils than the previous test (Horiba: Solvent extraction, infrared spectroscopy). The associated consent limit was originally intended for the Horiba method and was informed by previous monitoring results which had used this method. Furthermore, concentrations of associated parameters, e.g. BOD, were well below their respective consent limits on two of the occasions that oil and grease was elevated; reducing the total contamination of the stormwater. For these reasons, in conjunction with the results of the monitoring undertaken in the receiving tributary (discussed later in this section), no enforcement action was taken in response to the third of these elevated discharge results. No sewage fungus or heterotrophic growths were found at any of the three discharge points during sample collection.

Overall, the performance of Whareroa's stormwater system has continued to improve compared with recent monitoring years when there had been multiple breaches of the consent limit for BOD, SS and pH. After January 2019, there were no results above consent limits at any of the discharges. Furthermore, all oil and grease results were less than the limit of detection. This improvement in stormwater quality may be attributed to the newly commissioned in-line monitoring and diversion system. It should be noted that the Council recommends Fonterra initiates a review of the oil and grease consent limit given the change in test method.

During the year, a spring biological inspection was undertaken in the tributaries that receive stormwater from the Tawhiti and coastal pond systems, while a biomonitoring survey was carried out in the tributary downstream of the Tangahoe ponds. In the summer, biomonitoring surveys were carried out in all three tributaries. In summary, the results from the surveys and inspections indicated that stormwater discharges from the factory had not had recent detrimental effects upon the streambed communities in any of the tributaries.

Results from biomonitoring undertaken in the 2017-2018 monitoring year indicated a decline in stream health in the tributary downstream of the Tangahoe pond system. These results were most pronounced at the site closest to the discharge, and corroborated initial findings from the spring biological inspection which were indicative of mildly eutrophic conditions. In response to this, the Council undertook a complete spring biomonitoring survey in this tributary in place of the biological inspection in the year under review. The results indicate that the instream health of this tributary has generally improved over the past 12 months. As such, the spring biomonitoring survey will revert back to the standard inspection format (a recommendation to this effect is included in Section 3.4).

3.2.3 Wastewater

A number of routine monitoring components were used to assess the wastewater discharge and its environmental effects. Fonterra measured effluent outflow and collected 24-hour composite samples to analyse the wastewater composition. The Council collected ten wastewater grab samples and undertook three inter-laboratory comparisons of 24-hour composite samples with Fonterra. In terms of environmental effects, the marine outfall was visually inspected from the coastal look out during each Council inspection, and two intertidal ecological surveys were undertaken.

The limit on the daily volume of wastewater discharged was not exceeded during the 2018-2019 season. Results of composite monitoring by Fonterra found that suspended solids and COD concentrations remained compliant throughout the year. However, wastewater fat content exceeded the consent limit (800 g/m^3) on one occasion, on 28 May 2019 (1,200 g/m^3). This exceedance was due to a cream spill which ultimately discharged via the marine outfall. There was no evidence of dairy fat contamination on any of the nearby beaches that were searched following receipt of the sample results. An infringement notice was issued in response to this event. Earlier in the year, on 13 March 2019, Fonterra notified Council of a potential non-compliance when the cleaning of a blocked drier resulted in a possible discharge of milk powder through the marine outfall. Discharge limits were complied with following the event. No visible effects were observed on the sea surface above the outfall or on the foreshore at Ohawe beach. Despite one non-compliance during the year, Fonterra's wastewater performance showed an improvement from the previous year, where there were three exceedances on two separate days. Fonterra's wastewater performance over recent monitoring years is summarised in Table 18, below.

Table 18 Wastewater discharge compliance history

Month	Discharge volume	Suspended solids	Fat	COD	Number of non-compliance days
2015-2016	-	12	2	-	14
2016-2017	-	-	-	-	0
2017-2018	-	1	2	-	2
2018-2019	-	-	1	-	1

Wastewater grab samples were collected by the Council on 10 occasions during the monitoring period. All of the results complied with consent limits. As the consent limits in special condition 5, consent 1450 apply to the composite samples and not the grab samples, any exceedances would not have counted as a breach of consent. Bacteriological results have remained high; an issue that warrants ongoing investigation.

Visual inspections of the outfall discharge undertaken from the coastal lookout during routine inspections found no evidence of the discharge adversely affecting the coastal environment beyond the mixing zone designated in resource consent 1450.

Spring and summer intertidal ecological surveys were undertaken in the year under review. Neither survey provided evidence to suggest that the outfall was having any adverse effects on the intertidal reef

communities of South Taranaki. Natural environmental factors, including coastal erosion, exposure and substrate mobility, appeared to be dominant drivers of species richness and diversity at the sites surveyed.

Although monitoring did not detect any further impacts, it should be noted that milk and cream spills can have insidious effects in the marine environment. These events can potentially lead to short-lived proliferations of bacterial and algal communities in the receiving environment, due to the high BOD and nutrient content. Following these proliferation events, or blooms, dissolved oxygen content is depleted from the water column, leading to hypoxic or even anoxic conditions. Further adverse effects may also arise, from increased loading of suspended solids, for example.

3.2.4 Air discharges

Throughout the 2018-2019 monitoring period, emissions to air were monitored with visual inspections, odour surveys, testing of particulate emissions, gauging of milk powder deposition, measurement of ambient nitrogen concentration and PM_{10} monitoring.

Onsite milk powder deposition ranged from negligible to high during the year, however, no environmental impacts were detected beyond the site boundary with visual inspections or odour observations.

Emission source analysis (stack testing) results found that particle emissions from all drier facilities were compliant, except for Powder-3, during the year. In the previous monitoring year, Fonterra trialled drying whey powder concentrate (WPC) in the Powder-3 facility (which was typically used for the manufacture of whole milk powder and butter milk powder). Following the trials, Fonterra applied to change the consent to reflect the WPC drying operation in Powder-3 going forward (4103-2.3, July 2018). The emissions' concentration consent limit was increased from 125 mg/m^3 to 150 mg/m^3, however, the production changes were such that the potential mass load discharged from the dryer stacks did not increase. Subsequent stack testing carried out in January 2019 found that Powder-3 emissions were non-compliant when drying buttermilk and WPC. Considerable investigative efforts were made to optimise the process such that emissions were reduced to an acceptable range for all products that are dried in Powder-3. Fonterra also undertook additional measures to prevent further non-compliances with consent conditions, including transporting whey stock to another Fonterra site for drying (at considerable expense). Powder deposition levels around site during these compliance issues were typical and no adverse environmental effects were discovered.

Consistent with previous years, milk powder deposition was consistently high at the staff car park over the monitoring period, suggesting that the majority of the powder fallout occurred in the immediate vicinity of the powder plants. Deposition of milk powder on the site is not of great environmental concern, provided that the stormwater management systems perform satisfactorily. There were also a series of high results from various locations outside of the site boundary recorded during the year. Of note, deposition values exceeded 130 mg/m^2/day at four out of five monitoring sites between 26 November and 17 December 2018. However, it is difficult to definitively attribute these results to milk powder deposition without corroborating evidence, given the potential for other sources of organic material to affect the results (e.g. vegetation, insects, and fertilizer). Deposited milk powder levels appeared typical during the site inspections, and no complaints were received regarding high volumes of deposited milk powder on neighboring properties. Elevated particulate emission concentrations at Powder-3 may have increased powder fallout beyond the site boundary above typical levels, however, the throughput and performance of the other driers must also be taken into account.

Fonterra remained compliant with NO_x limits stipulated in consent 6273 during the 2018-2019 monitoring period. Ambient NO_x concentrations at Fonterra Whareroa were comparable with those at some of Taranaki's larger hydrocarbon production stations.

Monitoring indicated that PM_{10} concentrations at Fonterra Whareroa remained below the consent limit and National Environmental Standard.

3.3 Evaluation of performance

A summary of Fonterra's compliance record for the year under review is set out in Tables 19-36.

3.3.1 Water abstraction

Table 19 Summary of performance for Consent 0047-4.0

Purpose: ***To take water from the Tawhiti Stream and the Tangahoe River for various plant purposes***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Combined total abstraction limit of 30,000 m^3 over 24 hours	Fonterra monitor compliance. Abstraction data is also telemetered to the Council and reviewed by Council officers	Yes
2. Maximum abstraction rate in Tawhiti Stream when flow is less than 800 L/s	Fonterra monitor compliance. Abstraction data is also telemetered to the Council and reviewed by Council officers	Yes
3. Maintenance of minimum flows	Council's telemetered sites	Yes
4. Reduced minimum flow in Tangahoe River for maximum of 21 days	Council's telemetered site	N/A
5. Maintenance of minimum flows during an emergency situation of no more than 48 hours	Council's telemetered sites	N/A
6. Report requirement following an emergency situation	Council review	N/A
7. Requirements for measuring and recording flow	Equipment inspected by Council. Data telemetered to Council	Yes
8. Requirements for installation of water meters, data loggers, and turbidity meters	Equipment inspected by Council. Data telemetered to Council	Yes
9. Requirement for installation of fish screens at intakes	Installation due by 8 November 2019	N/A
10. Certification of water meters and data loggers	Equipment inspected by Council	Yes
11. Preparation, implementation and compliance with all plans required by consent	Kaitiaki Group meetings, self-reporting, Council monitoring	Yes
12. Preparation and submission of Tangata Whenua Involvement Plan (TWIP)	Tangata Whenua Involvement Plan (version 2) provided to Council	Yes
13. Purpose of the TWIP	Council review	Yes
14. Minimum requirements of the TWIP	Council review	Yes
15. Provision for consent holder review and amendment of TWIP	Review not undertaken during monitoring period	N/A
16. Monitoring Plan requirement	Monitoring Plan revisions underway	Yes

Purpose: *To take water from the Tawhiti Stream and the Tangahoe River for various plant purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
17. Provision of Monitoring Plan to Fish and Game for review	Monitoring Plan revisions underway	N/A
18. Implementation and compliance with Monitoring Plan	Monitoring Plan revisions underway	N/A
19. Preparation of Low Flow Contingency Plan	Plan received April 2018	Yes
20. Recording and reporting of turbidity, abstraction volumes and river flow in accordance with consent	Council review	Yes
21. Consent holder to notify Council if measuring or recording equipment malfunctions	No issues during monitoring year	N/A
22. Equipment to be readily accessible for Council Officers to inspect and verify	Council inspection	Yes
23. Provision of Annual Performance Data Summary Report	Report received July 2019	Yes
24. Water Efficiency BPO Report	First report due 1 June 2021	N/A
25. Provision of financial contribution for the mitigation of adverse environmental effects	Payment received April 2019	Yes
26. Specification for financial contribution	Council review	Yes
27. Annual provision of Financial Contribution and Environmental Enhancement Report (FCEER)	No enhancement projects completed yet	N/A
28. Council review provision	Next optional review in June 2021	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

3.3.2 Water discharges

Table 20 Summary of performance for Consent 1450-3.0

Purpose: *To discharge dairy factory wastewater into the Tasman Sea*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Discharge to only occur through outfall and diffuser	Diving inspections	Yes

Purpose: *To discharge dairy factory wastewater into the Tasman Sea*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
2. Discharge volume not to exceed 40,000 m^3 over 24 hours	Council review of Fonterra monitoring data	Yes
3. Discharge shall not include sewage	Council wastewater sampling and review of Fonterra monitoring data	Yes
4. Constituent limits for wastewater discharge	Council wastewater sampling and review of Fonterra monitoring data	**No**
5. No adverse effects on receiving environment beyond mixing zone	Council monitoring	Yes
6. Measure, record and report rate and volume of wastewater data	Council review of Fonterra monitoring data	Yes
7. Installation and commission of Dissolved Air Flotation (DAF) Unit	DAF Unit to be commissioned by 1 August 2021	N/A
8. Provision of DAF Performance Report	Report due by 1 June 2022	N/A
9. Preparation, implementation and compliance with all plans required by consent	Kaitiaki Group meetings, self-reporting, Council monitoring	Yes
10. Preparation and submission of Tangata Whenua Involvement Plan (TWIP)	Tangata Whenua Involvement Plan (version 2) provided to Council	Yes
11. Purpose of the TWIP	Council review	Yes
12. Minimum requirements of the TWIP	Council review	Yes
13. Provision for consent holder review and amendment of TWIP	Review not undertaken during monitoring period	N/A
14. Monitoring Plan requirement	Monitoring Plan revisions underway	Yes
15. Implementation and compliance with Monitoring Plan	Monitoring Plan revisions underway	Yes
16. Preparation of Contingency Plan	Fonterra Whareroa Wastewater Discharge Management Plan received December 2018 (version 2)	Yes
17. Provision of Annual Performance Data Summary Report	Report received July 2019	Yes
18. Wastewater Management BPO Report	First report due 1 June 2021	N/A
19. Council review provision	Next optional review in June 2021	N/A
20. Provision for review of condition 4, upon receipt of DAF Performance Report	Report due by 1 June 2022	N/A

Purpose: *To discharge dairy factory wastewater into the Tasman Sea*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Good** **High**

Table 21 Summary of performance for Consent 3902-3.0

Purpose: *To discharge stormwater into Tangahoe River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option to prevent or minimise adverse effects	Site inspections	Yes
2. Catchment area not to exceed 10 ha	Consent holder liaison	Yes
3. Consent holder to prepare and maintain contingency plan	Whareroa Underground Services and Water Discharge Management Plan (version 1) received Jan 2018	Yes
4. Consent holder to prepare and maintain stormwater management plan	Whareroa Underground Services and Water Discharge Management Plan (version 1) received Jan 2018	Yes
5. Effects on receiving waters	Site inspections, physicochemical analysis, freshwater biomonitoring surveys	Yes
6. No visible bacterial and/or fungal growths downstream	Site inspections and freshwater biomonitoring surveys	Yes
7. Limits on chemical composition of discharge	Physicochemical analysis	Yes
8. Maintenance of fencing and planting of riparian margin	Site inspections	Yes
9. Optional review provision re. environmental effects	Next optional review in June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

Table 22 Summary of performance for Consent 3907-3.0

Purpose: ***To discharge stormwater into Tawhiti Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option to prevent or minimise adverse effects	Site inspections	Yes
2. Catchment area not to exceed 13 ha	Consent holder liaison	Yes
3. Consent holder to prepare and maintain contingency plan	Whareroa Underground Services and Water Discharge Management Plan (version 1) received Jan 2018	Yes
4. Consent holder to prepare and maintain stormwater management plan	Whareroa Underground Services and Water Discharge Management Plan (version 1) received Jan 2018	Yes
5. Effects on receiving waters	Site inspections, physicochemical analysis, freshwater biomonitoring surveys	Yes
6. No visible bacterial and/or fungal growths downstream	Site inspections and freshwater biomonitoring surveys	Yes
7. Limits on chemical composition of discharge	Physicochemical analysis	Yes
8. Optional review provision re. environmental effects	Next optional review in June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

Table 23 Summary of performance for Consent 4133-3.1

Purpose: ***To discharge stormwater to the unnamed coastal stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option to prevent or minimise adverse effects	Site inspections	Yes
2. Catchment area not to exceed 21 ha	Consent holder liaison	Yes
3. Consent holder to prepare and maintain contingency plan	Whareroa Underground Services and Water Discharge Management Plan (version 1) received Jan 2018	Yes
4. Consent holder to prepare and maintain stormwater management plan	Whareroa Underground Services and Water Discharge Management Plan (version 1) received Jan 2018	Yes
5. Effects on receiving waters	Site inspections, physicochemical analysis, freshwater biomonitoring surveys	Yes

Purpose: *To discharge stormwater to the unnamed coastal stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
6. No visible bacterial and/or fungal growths downstream	Site inspections and freshwater biomonitoring surveys	Yes
7. Limits on chemical composition of discharge	Physicochemical analysis	Yes
8. Maintenance of fencing and planting of riparian margin	Site inspections	Yes
9. Optional review provision re. environmental effects	Next optional review in June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

Table 24 Summary of performance for Consent 4927-2.0

Purpose: *To discharge river silt and sand to the Tawhiti Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. No adverse effects beyond mixing zone	Implementation of Monitoring Plan	N/A
2. Preparation of a Monitoring plan	Monitoring plan under revision	Yes
3. Implementation and compliance with Monitoring plan	Monitoring plan yet to be established	N/A
4. Optional review provision re. environmental effects	Next review due in June 2021	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

Table 25 Summary of performance for Consent 5148-2.0

Purpose: *To discharge river silt and sand into the Tangahoe River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. No adverse effects beyond mixing zone	Implementation of Monitoring Plan	N/A
2. Preparation of a Monitoring plan	Monitoring plan under revision	Yes
3. Implementation and compliance with Monitoring plan	Monitoring plan yet to be established	N/A
4. Optional review provision re. environmental effects	Next review due in June 2021	N/A

Purpose: *To discharge river silt and sand into the Tangahoe River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

3.3.3 Coastal permits

Table 26 Summary of performance for Consent 5013-2.0

Purpose: *To occupy CMA with, and maintain, a rock wall, outfall and diffuser structure*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Structures to be maintained so that they function effectively	Structures were deemed to be functioning effectively during period under review	Yes
2. Annual outfall inspection and report	Annual inspection report received July 2018	Yes
3. Provision of Maintenance Work Plan, if necessary	Maintenance work plan received December 2018	Yes
4. Confirmation of completion of works, if undertaken	Maintenance carried out between 17 Jan 2019 – 15 Feb 2019, report received April 2019	Yes
5. Outfall pipeline shall not be visible at any time	Intertidal ecological inspections	Yes
6. Optional review provision re. environmental effects	Next review option in June 2021	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

3.3.4 Air discharges

Table 27 Summary of performance for Consent 4103-2.3

Purpose: *To discharge emissions to air from the manufacture and processing of milk products*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option to prevent or minimise adverse effects	Review of contingency and management plans and air quality monitoring	Yes
2. Measures representing best practicable option may be reviewed	Provision of BPO report	Yes

Purpose: *To discharge emissions to air from the manufacture and processing of milk products*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
3. Any alterations to the plant, processes or operations must be approved by Council	WPC drying in Powder-3 authorised by Council through consenting processes	Yes
4. Written report with regard to emissions, improvements and mitigation within five years and every six thereafter	Report submitted July 2013, next due July 2019	N/A
5. Consent authorises discharges to air according to application	Consent holder liaison	Yes
6. Use of most appropriate process equipment and controls to minimise emissions and impacts	Report detailing emissions and technology received	Yes
7. Powder emissions to atmosphere <125 mg/m^3 (subject to condition 8)	Emission source analysis (stack testing)	Yes
8. Powder emissions to atmosphere from Powder-3 <150 mg/m^3	Emission source analysis (stack testing)	**No**
9. Limits on depositions beyond boundary	Inspections, deposition gauging	Yes
10. PM_{10} not to exceed 50 µg/m^3	Air quality monitoring	Yes
11. No odour at or beyond boundary	Inspections	Yes
12. Monitoring of emissions	Air quality monitoring	Yes
13. Annual meeting with Council and submitters	Whareroa community meeting held June 2019	Yes
14. Powder-5 can only process skim milk powder if Council are given five days' notice and a monitoring programme for the emissions is developed	No skim milk powder processed in Powder-5	N/A
15. Review of conditions if Condition 14 activated	No skim milk powder processed in Powder-5	N/A
16. Council may review consent for the purpose of dealing with any adverse effects	Next optional review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

Table 28 Summary of performance for Consent 5044-2.0

Purpose: *To discharge emissions into the air from the disposal of laboratory wastes, and stormwater and sump cleanings onto and into land*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of BPO to minimise adverse effects on the environment	Set out in management plan and emission report submitted to Council	Yes
2. Exercise of consent in accordance with application	Site inspections, consent holder liaison	Yes
3. Approval of a management plan	Air Management Plan (version 4) received Dec 2019, Whareroa Land Disposal Management Plan (version 8) received Dec 2019	Yes
4. Discharges resulting in no objectionable odours at site boundary	Site inspections.	Yes
5. Characteristics of an objectionable odour		N/A
6. Optional review	No further reviews available, expires June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

Table 29 Summary of performance for Consent 6257-1.1

Purpose: *To discharge emissions to air from dual fuel boilers*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practicable option to prevent or minimise adverse environmental effects	Consent not yet exercised	N/A
2. Exercise of consent in accordance with application	Consent not yet exercised	N/A
3. Characteristics of coal similar to that described in application	Consent not yet exercised	N/A
4. Report on best practicable option within three months of commissioning	Consent not yet exercised	N/A
5. Review of measures relating to best practicable option	Consent not yet exercised	N/A
6. Minimisation of emissions	Consent not yet exercised	N/A
7. Minimum height of discharges 60 m	Consent not yet exercised	N/A

Purpose: *To discharge emissions to air from dual fuel boilers*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
8. Approval from Council prior to plant alterations	Consent not yet exercised	N/A
9. Discharges not to exceed 20% obscuration	Consent not yet exercised	N/A
10. Discharges of particulate not to exceed 100 mg/Nm^3	Consent not yet exercised	N/A
11. Sulphur dioxide discharges not to exceed 385 kg/hr	Consent not yet exercised	N/A
12. Discharges of particulate not to exceed 43 kg/hr	Consent not yet exercised	N/A
13. Discharges of nitrogen oxides not to exceed 319 kg/hr	Consent not yet exercised	N/A
14. Maximum ground level concentration of sulphur dioxide not to exceed 350 mg/m^3	Consent not yet exercised	N/A
15. Maximum ground level concentration of nitrogen dioxide not to exceed 350 mg/m^3	Consent not yet exercised	N/A
16. Maximum ground level concentration of PM_{10} not to exceed 50 mg/m^3	Consent not yet exercised	N/A
17. Maximum ground level concentration of each or any metal not to exceed guideline values	Consent not yet exercised	N/A
18. Maximum ground level concentration of other contaminants not to exceed workplace exposure standards	Consent not yet exercised	N/A
19. Discharges not to give rise to significant ecological effects	Consent not yet exercised	N/A
20. Analysis of coal on a monthly basis	Consent not yet exercised	N/A
21. Consent holder to install and maintain various measuring devices	Consent not yet exercised	N/A
22. Consent holder to undertake annual source emission monitoring	Consent not yet exercised	N/A
23. Monitoring programme prepared	Provisional programme in place	Yes
24. Reporting regarding advances in technology	Consent not yet exercised	N/A
25. Reporting regarding emissions	Due 12 months from exercise of consent	N/A

Purpose: *To discharge emissions to air from dual fuel boilers*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
26. Cultural impact report	Due 12 months from exercise of consent	N/A
27. Consent holder to undertake annual liaison meetings	Within 12 months of commissioning of energy centre	N/A
28. Consent lapse	Consent will lapse 1 June 2034 unless given effect to earlier	N/A
29. Review of conditions	Next optional review in June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**N/A**

N/A = not applicable

Table 30 Summary of performance for Consent 6273-1.1

Purpose*: To discharge emissions into the air from 'Cogen I' and 'Cogen II' co-generation energy generating plants*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practical option to minimise adverse effects on environment	Site inspections, air quality monitoring, report as required by condition 4	Yes
2. Review of best practical option measures	No review undertaken	N/A
3. Approvals to be obtained for alterations	No alterations during period under review	N/A
4. Report on emissions and new technologies	Next report due in 2020	N/A
5. Specified circumstances under which diesel may be used to heat boilers	Diesel not used during period under review	N/A
6. Notification requirement	Diesel not used during period under review	N/A
7. Diesel specifications	Diesel not used during period under review	N/A
8. Sulphur dioxide < 350 µg/m^3 (1 hour exposure) or < 125 µg/m^3 (24-hour exposure)	Diesel not used during period under review	N/A
9. Carbon monoxide < 10 mg/m^3 (8 hour exposure) or <30 mg/m^3 (one-hour exposure)	Not monitored during period under review	N/A
10. Sum of nitrogen oxides not to exceed 48 g/s	Not monitored during period under review	N/A
11. Nitrogen dioxide not to exceed 200 µg/m^3 (one-hour average) or 100 µg/m^3 (24-hour average)	Air quality monitoring	Yes

Purpose: *To discharge emissions into the air from 'Cogen I' and 'Cogen II' co-generation energy generating plants*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
12. PM_{10} not to exceed 50 µg/m^3 (24-hour average)	Air quality monitoring	Yes
13. Control of emissions so that max concentration of any contaminant is not increased by more than 1/30th of the relevant Workplace Exposure Standard	Not monitored during period under review	N/A
14. Minimum height of discharge 17.5 m above ground	Structure has not been altered	Yes
15. Minimisation of emissions and impacts by selection of most appropriate equipment etc	Air quality monitoring, as discussed in report required by condition 4	Yes
16. Consent holder to undertake monitoring of emissions and their effects	Monitoring plan in place	Yes
17. No emissions of visible smoke or plume of water vapour	Inspections	Yes
18. Water treatment regime to the satisfaction of Council	Inspections	Yes
19. Optional review of consent	Next optional review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

Table 31 Summary of performance for Consent 7465-1.0

Purpose: *To discharge emissions into the air from the combustion of waste wood packaging*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Only untreated timber packaging to be burned	Consent no longer exercised	N/A
2. Total volume not to exceed 4m^3	Consent no longer exercised	N/A
3. Best practicable option to minimise environmental effects	Consent no longer exercised	N/A
4. Regard to wind and weather conditions	Consent no longer exercised	N/A
5. Discharge not to give rise to contaminants beyond boundary	Consent no longer exercised	N/A
6. Discharge not to give rise to odour beyond the boundary	Consent no longer exercised	N/A

Purpose: *To discharge emissions into the air from the combustion of waste wood packaging*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
7. Records to be maintained of burning events	Consent no longer exercised	N/A
8. Consent lapse if not given effect before 2014	Consent no longer exercised	N/A
9. Optional review of consent	Next scheduled optional review in June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**N/A**

N/A = not applicable

3.3.5 Discharges of waste to land

Table 32 Summary of performance for Consent 4406-2.0

Purpose: *To discharge laboratory wastes onto and into land*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of action likely to minimise adverse effects on the environment	Consent no longer exercised	N/A
2. Enacted in accordance with the terms of the application	Consent no longer exercised	N/A
3. Limitations on size of discharge	Consent no longer exercised	N/A
4. Management plan for discharge site provided	Consent no longer exercised	N/A
5. Siting of discharge pits	Consent no longer exercised	N/A
6. Limitations on placing of discharge sites	Consent no longer exercised	N/A
7. Disposal pits cannot intercept water table	Consent no longer exercised	N/A
8. Contaminants entering other bodies of water not permitted	Consent no longer exercised	N/A
9. Cannot lead to adverse impacts on surrounding bodies of water	Consent no longer exercised	N/A
10. Items permitted to be discharged	Consent no longer exercised	N/A
11. Earth cover over discharge	Consent no longer exercised	N/A
12. Soil and vegetation cover over pits	Consent no longer exercised	N/A
13. Maintenance of soil cover	Consent no longer exercised	N/A
14. Records to be kept on pit usage	Consent no longer exercised	N/A

Purpose: *To discharge laboratory wastes onto and into land*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
15. Optional review provision re environmental effects	No further reviews available, expires June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**N/A**

N/A = not applicable

Table 33 Summary of performance for Consent 5036-2.0

Purpose: *To discharge waste material onto land*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of action likely to minimise adverse effects on the environment	Review of management plan	Yes
2. Disposal of unprocessable wastes via irrigation to comply with nitrogen and COD loading limits	Not monitored during period under review	N/A
3. Exercise of consent in accordance with applications	Liaison with consent holder	Yes
4. Limits on discharge of stormwater sump cleanings and unprocessable dairy waste	Liaison with consent holder	Yes
5. Consent holder to provide management plan	Whareroa Land Disposal Management Plan (version 8) received Dec 2019	Yes
6. Discharge not within 50 m of bore, 25 m of surface water, 100 m from cliff	Liaison with consent holder	Yes
7. Disposal pit(s) not to intercept the water table	Site inspections and liaison with consent holder	Yes
8. Exercise of consent not to lead to contaminants entering a water body via overland surface flows	Not monitored during period under review; no incidents reported	N/A
9. Exercise of consent not to result in adverse impacts on groundwater	Not monitored during period under review; no incidents reported	N/A
10. Discharged material to be covered by 50 mm soil	Site inspections and liaison with consent holder	Yes
11. Liquid to be removed from disposal pits prior to covering	Site inspections and liaison with consent holder	Yes
12. Only materials outlined in application to be discharged	Site inspections, liaison with consent holder and requirements in management plan	Yes
13. Disposal pits to be reinstated and re-vegetated	Site inspections and liaison with consent holder	Yes

Purpose: *To discharge waste material onto land*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
14. Cover layer to be suitably maintained	Site inspections and liaison with consent holder	Yes
15. Disposal not to give rise to objectionable or offensive odours beyond boundary	Site inspections and liaison with consent holder; no complaints received	Yes
16. Consent holder to maintain records of discharge	Records of dates and volume of discharges available	Yes
17. Discharge of unprocessable wastes to occur only after all other options have been exhausted	Site inspections, liaison with consent holder	Yes
18. Optional review provision re. environmental effects	No further reviews available, expires June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

Table 34 Summary of performance for Consent 9908-1.0

Purpose: *To discharge dairy liquids onto land and the associated emissions to air, in various locations throughout the Taranaki region*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Dairy liquids to be discharged; limited to dairy by-products, unprocessable dairy products and surplus dairy products	Consent not exercised during year under review	N/A
2. Exercise of consent in accordance with Dairy Liquids Spreading Management Plan	Dairy Liquids Spreading Management Plan (July 2019, version 8) received August 2019	Yes
3. Notify the Council of the intent to discharge dairy liquids to land	Consent not exercised during year under review	N/A
4. Discharge shall not result in any liquids ponding for more than 30 minutes	Consent not exercised during year under review	N/A
5. Discharge shall not result in any liquids reaching surface water, any subsurface drainage system or any adjacent property	Consent not exercised during year under review	N/A
6. Best practicable option to minimise environmental effects	Consent not exercised during year under review	N/A
7. No spray drift beyond the boundary of the property	Consent not exercised during year under review	N/A

Purpose: *To discharge dairy liquids onto land and the associated emissions to air, in various locations throughout the Taranaki region*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
8. Sodium adsorption ratio not exceeding 15	Consent not exercised during year under review	N/A
9. Nitrogen loading rate shall not exceed limits provided in consent	Consent not exercised during year under review	N/A
10. Discharge shall not occur within the minimum buffer distances provided in consent	Consent not exercised during year under review	N/A
11. No discharge within, adjacent to or directly impacting on any Statutory Acknowledgement Area	Consent not exercised during year under review	N/A
12. No offensive or objectionable odour beyond property boundary	Consent not exercised during year under review	N/A
13. Notify the Council within 48 hours of any accidental discharge	Consent not exercised during year under review	N/A
14. Maintain a complaints register	Consent not exercised during year under review	N/A
15. Notify the Council of event having significant adverse effect on water quality	Consent not exercised during year under review	N/A
16. Record of application sites	Consent not exercised during year under review	N/A
17. Farm register	Appendix 1 of Dairy Liquids Spreading Management Plan (July 2019, version 8)	Yes
18. Consent shall lapse 2019 if not exercised	Consent has been exercised	N/A
19. Optional review of consent	Next scheduled optional review in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

3.3.6 Land use permits

Table 35 Summary of performance for Consent 10208-1.0

Purpose: *To construct, place and use a water intake structure in the bed of the Tangahoe River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Structure shall be constructed in accordance with specified documentation	Site inspections and liaison with consent holder (construction now complete)	N/A
2. Signage requirements	Site inspections and liaison with consent holder (construction now complete)	N/A

Purpose: *To construct, place and use a water intake structure in the bed of the Tangahoe River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
3. Meet with a Council Officer prior to commencement of works	Site inspections and liaison with consent holder (construction now complete)	N/A
4. Erosion control requirements	Site inspections and liaison with consent holder (construction now complete)	N/A
5. Sediment control requirements	Site inspections and liaison with consent holder (construction now complete)	N/A
6. Earthwork stabilisation requirements	Site inspections and liaison with consent holder (construction now complete)	N/A
7. Works notification requirement	Notification received (construction now complete)	N/A
8. Concrete work to be isolated from running water	Site inspections and liaison with consent holder (construction now complete)	N/A
9. Concrete to remain isolated from running water for 48 hours	Site inspections and liaison with consent holder (construction now complete)	N/A
10. Bank protection structures shall be installed following the installation of the coffer dam (in accordance with specified documentation)	Site inspections and liaison with consent holder (construction now complete)	N/A
11. No instream works between 1 May and 31 October inclusive	Site inspections and liaison with consent holder (construction now complete)	N/A
12. Streambed disturbance to be minimised and reinstated as far as practicable	Site inspections and liaison with consent holder (construction now complete)	N/A
13. Reasonable steps taken to minimise instream effects from sediment	Site inspections and liaison with consent holder (construction now complete)	N/A
14. Adopt best practicable option to prevent/ minimise adverse effects	Site inspections and liaison with consent holder (construction now complete)	N/A
15. Water flow shall not be adversely affected	Site inspections and liaison with consent holder (construction now complete)	N/A
16. Following works, river banks shall not be steeper than the existing natural banks	Site inspections and liaison with consent holder (construction now complete)	N/A
17. Works to remain responsibility of consent holder (and subsequent erosion, etc)	No issues noted during monitoring period	N/A
18. Protocols adopted if archaeological remains are discovered	Liaison with consent holder (construction now complete)	N/A
19. Consent lapse clause	Consent has been exercised	N/A

Purpose: *To construct, place and use a water intake structure in the bed of the Tangahoe River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
20. Consent review clause	Next optional review in June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**N/A**

N/A = not applicable

Table 36 Evaluation of overall environmental performance over time

Year	High	Good	Improvement req	Poor
2015	-	✓	-	-
2016	-	-	✓	-
2017	-	✓	-	-
2018	-	-	✓	-
2019	-	✓	-	-
Totals	-	3	2	0

During the year, Fonterra demonstrated a good level of environmental and high level of administrative performance with the resource consents as defined in Section 1.1.4.

3.4 Recommendations from the 2017-2018 Annual Report

In the 2017-2018 Annual Report, it was recommended:

1. THAT in the first instance monitoring of air emissions from the Whareroa plant in the 2018-2019 year continues at the same level as in 2017-2018.
2. THAT monitoring of water discharges (including stormwater) and abstractions for the Whareroa plant in the 2018-2019 year continues at the same level as in 2017-2018.
3. THAT freshwater and marine ecological monitoring in the 2018-2019 year continues at the same level as in 2017-2018, with the inclusion of an additional three site biomonitoring survey (as discussed in Section 3.5).
4. THAT combined inspections of the Whareroa plant for monitoring of air emissions and of water abstractions and discharges in the 2018-2019 year continues at the same level as in 2017-2018.
5. THAT additional monitoring components may be incorporated into the programme to satisfy new consent requirements (1450, 0047, 4927 and 5148), pending agreement between the Kaitiaki group.
6. THAT the wastewater and coastal components of the 2018-2019 monitoring programme are reported in conjunction with the Hawera Wastewater Treatment Plant monitoring programme as a combined outfall report.
7. THAT the freshwater, land and air components of the 2018-2019 monitoring programme are reported together, separate from the combined outfall report.

8. THAT should there be issues with environmental or administrative performance in 2018-2019, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

With the exceptions of 6 and 7, these recommendations were all implemented during the 2018-2019 monitoring period. In order to keep the respective monitoring reports clear and succinct, the Fonterra Whareroa report will continue to remain a separate report.

3.5 Alterations to monitoring programmes for 2019-2020

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 2019-2020, the spring biomonitoring survey undertaken in the unnamed tributary of the Tangahoe River reverts back to a biological inspection. Further monitoring components, including a Taonga species survey on Pukeroa Reef, and biomonitoring surveys in the Tawhiti Stream and Tangahoe River will also be trialled, as required by resource consents 1450, 0047, 4927 and 5148.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site 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 2019-2020.

A recommendation to this effect is attached to this report.

4 Recommendations

1. THAT in the first instance monitoring of air emissions from the Whareroa plant in the 2019-2020 year continues at the same level as in 2018-2019.
2. THAT, monitoring of water discharges (including stormwater) and abstractions for the Whareroa plant in the 2019-2020 year continues at the same level as in 2018-2019.
3. THAT, subject to recommendations 4 and 5, freshwater and marine ecological monitoring in the 2019-2020 year continues at the same level as in 2018-2019.
4. THAT, the spring biomonitoring survey undertaken in the unnamed tributary of the Tangahoe River reverts back to a biological inspection.
5. THAT, further monitoring components, including a Taonga species survey on Pukeroa Reef, and biomonitoring surveys in the Tawhiti Stream and Tangahoe River will also be trialled, as required by resource consents 1450, 0047, 4927 and 5148.
6. THAT combined inspections of the Whareroa plant for monitoring of air emissions and water discharges in the 2019-2020 year continues at the same level as in 2018-2019.
7. THAT, Fonterra initiates a review of the current oil and grease stormwater consent limit, given the recent change in test method.
8. THAT should there be issues with environmental or administrative performance in 2018-2019, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Glossary of common terms and abbreviations

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

Biomonitoring	Assessing the health of the environment using aquatic organisms.
BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
BODCF	Biochemical oxygen demand of a filtered sample.
Bund	A wall around a tank to contain its contents in the case of a leak.
CBOD	Carbonaceous biochemical oxygen demand. A measure of the presence of degradable organic matter, excluding the biological conversion of ammonia to nitrate.
cfu	Colony forming units. A measure of the concentration of bacteria usually expressed as per 100 millilitre sample.
COD	Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in in µS/cm.
Cumec	A volumetric measure of flow- 1 cubic metre per second (1 m^3s^{-1}).
DO	Dissolved oxygen.
DRP	Dissolved reactive phosphorus.
E. coli	*Escherichia coli*, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Ent	Enterococci, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre of sample.
FC	Faecal coliforms, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
$g/m^2/day$	grams/$metre^2$/day.
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.
m^2	Square metres.
MCI	Macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats.
µS/cm	Microsiemens per centimetre
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
NH_4	Ammonium, normally expressed in terms of the mass of nitrogen (N).
NH_3	Unionised ammonia, normally expressed in terms of the mass of nitrogen (N).
NO_3	Nitrate, normally expressed in terms of the mass of nitrogen (N).
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
O&G	Oil and grease, defined as anything that will dissolve into a particular organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons).
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.
Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment.
PM_{10}	Relatively fine airborne particles (less than 10 micrometre diameter, respectively).
$PM_{10,}$ $PM_{2.5,}$ $PM_{1.0}$	Relatively fine airborne particles (less than 10 or 2.5 or 1.0 micrometre diameter, respectively).
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	*Resource Management Act 1991* and including all subsequent amendments.
Shannon-Wiener index	An ecological diversity measure which factors in the number of species present and their relative abundance.
SS	Suspended solids.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
Turb	Turbidity, expressed in NTU.

For further information on analytical methods, contact a Science Services Manager.

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Appendix I

Resource consents held by Fonterra

(For a copy of the signed resource consent
please contact the TRC Consents department)

Consent number	Purpose	Granted	Review	Expires
Water abstraction permit				
0047-4	To take water from the Tawhiti Stream and the Tangahoe River for the purposes of processing and manufacturing dairy products, cleaning of plant, cooling, domestic use and for a co-generation plant	Nov 2017	June 2021	June 2052
Water discharge permits				
1450-3	To discharge all wastewater from dairy factory processes and associated processes undertaken at the Whareroa dairy processing site through a marine outfall into the Tasman Sea	Nov 2017	June 2021	June 2052
3902-3	To discharge stormwater from the Whareroa milk processing site into an unnamed tributary of the Tangahoe River	Feb 2014	June 2022	June 2028
3907-3	To discharge stormwater, back flushing from the sand filters and intermittent discharges of treated water from a reservoir, from the Whareroa milk processing site into an unnamed tributary of the Tawhiti Stream	Feb 2014	June 2022	June 2028
4133-3.1	To discharge stormwater, backwash and treated process water from the Whareroa milk processing site and the Water Treatment Plant into Unnamed Stream 18	Jan 2016	June 2022	June 2028
4927-2	To discharge river silt and sand from mechanical pre-filtering of river water during abstraction of water, by returning it into the Tawhiti Stream	Nov 2017	June 2021	June 2052
5148-2	To discharge river silt and sand from mechanical pre-filtering of river water during abstraction of water, by returning it into the Tangahoe River	Nov 2017	June 2021	June 2052
Air discharge permit				
4103-2.3	To discharge emissions into the air from the manufacture and processing of milk products and associated processes	Jul 2018	June 2020	June 2025
5044-2	To discharge emissions into the air from the disposal of laboratory wastes, and stormwater and sump cleanings onto and into land	Feb 2004	-	June 2022
6257-1.1	To discharge emissions into the air from dual fuel boilers (gas or coal) with a maximum energy output of 250 MW together with associated processes	June 2015	June 2022	June 2034
6273-1.1	To discharge emissions into the air from 'Cogen-I' and 'Cogen-II' co-generation energy generating plants with an energy output of 70 MW together with associated processes	Oct 2018	June 2020	June 2025
7465-1	To discharge emissions into the air from the combustion of waste wood packaging	Mar 2009	June 2022	June 2028
Discharges of waste to land				
4406-2	To discharge laboratory wastes onto and into land	Feb 2004	-	June 2022

Consent number	Purpose	Granted	Review	Expires
5036-2	To discharge waste material from stormwater sumps and road sump and unprocessable dairy factory wastes onto and into land	Dec 2012	-	June 2022
9908-1	To discharge dairy liquids onto land and the associated emissions to air, in various locations throughout the Taranaki region	June 2014	June 2020	June 2034
Land use permits				
10208-1	To construct, place and use a water intake structure in the bed of the Tangahoe River for industrial water supply purposes, including associated discharge of construction stormwater from the site	Feb 2016	June 2022	June 2028
5845-1	To remove, reconstruct, erect, place and maintain a dam structure and associated fish pass on the Tawhiti Stream for water intake purposes	July 2001	-	June 2015*
Coastal permits				
5013-2	To occupy the Coastal Marine Area with and carry out routine maintenance on: • a marine outfall pipeline and diffuser structure approximately 1845 metres long; and • a rock wall approximately 100 metres long for the protection of the outfall, stream diversion pipelines and associated structures	Nov 2017	June 2021	June 2052

* This consent expired in June 2015, however, the legality of the structure as a permitted activity is currently being investigated.

Water abstraction permits

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14. Permits authorising the abstraction of water are issued by the Council under Section 87(d) of the RMA.

Water discharge permits

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations. Permits authorising discharges to water are issued by the Council under Section 87(e) of the RMA.

Air discharge permits

Section 15(1)(c) of the RMA stipulates that no person may discharge any contaminant from any industrial or trade premises into air, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising discharges to air are issued by the Council under Section 87(e) of the RMA.

Discharges of wastes to land

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national

regulations. Permits authorising the discharge of wastes to land are issued by the Council under Section 87(e) of the RMA.

Land use permits

Section 13(1)(a) of the RMA stipulates that no person may in relation to the bed of any lake or river use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Land use permits are issued by the Council under Section 87(a) of the RMA.

Coastal permits

Section 12(1)(b) of the RMA stipulates that no person may erect, reconstruct, place, alter, extend, remove, or demolish any structure that is fixed in, on, under, or over any foreshore or seabed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Coastal permits are issued by the Council under Section 87(c) of the RMA.

Water Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	17 October 2017
Commencement Date:	8 November 2017

Conditions of Consent

Consent Granted:	To take water from the Tawhiti Stream and the Tangahoe River for the purposes of processing and manufacturing dairy products, cleaning of plant, cooling, domestic use and for a co-generation plant
Expiry Date:	1 June 2052
Review Date(s):	June 2021 and at 5-yearly intervals thereafter
Site Location:	Main South Road & 135 Hicks Road, Hawera
Grid Reference (NZTM)	1712861E-5616233N (Tawhiti) 1715769E-5612503N (Tangahoe)
Catchment:	Tangahoe
Tributary:	Tawhiti

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

Rate of taking

1. The total amount of water taken from the Tawhiti Stream and the Tangahoe River in any 24 hour period ending at 6.00am (New Zealand Standard Time) shall not exceed 30,000 cubic metres.

2. When the flow in the Tawhiti Stream is less than 800 litres per second, as measured at the 'Tawhiti at Duffys' flow recorder site (Grid Ref NZTM 1714275-5615594), the rate of taking from the Tawhiti Stream shall not exceed 184 litres per second, unless the turbidity of the Tangahoe River at the take site (Grid Ref NZTM 1715770-5612494) is greater than 850 NTU, then the rate shall not exceed 347 litres per second.

   Advice Note:
   For the avoidance of doubt, this condition does not limit the amount of water that may be taken from the Tangahoe River, provided the amount does not exceed 30,000 cubic metres in accordance with condition 1.

Minimum flows

3. Except as provided for by conditions 4 and 5, no taking shall occur:
   (a) when the flow immediately downstream of the Tangahoe River take site is less than 450 litres per second; or
   (b) from the Tawhiti Stream when the flow, as recorded at the 'Tawhiti at Duffys' flow recorder site, is less than 240 litres per second.

4. On no more than 21 days during any period commencing 01 July and ending 30 June of the following year, taking may occur from the Tangahoe River if its flow is between 300 litres per second and 450 litres per second.

5. During an emergency situation, taking in accordance with condition 1 may occur for a period not exceeding 48 hours from the:
   (a) Tawhiti Stream when the flow at the 'Tawhiti at Duffys' flow recorder site is more than 50 litres per second; and
   (b) Tangahoe River when the flow immediately downstream of the intake is more than 273 litres per second.

   For the purposes of this condition, an emergency situation is the inability of the consent holder to take, pump, or treat the water taken, due to an event beyond the control of the consent holder, including: failure of power supply; contamination of river water, and damage to infrastructure (pumping station, pipeline, treatment plant).

6. On each occasion that condition 5 is exercised, the consent holder shall within seven working days of the emergency ceasing provide a written report to the Chief Executive, Taranaki Regional Council giving reasons for the emergency, the volumes of water abstracted, the minimum flows that occurred, the water conservation measures adopted during the emergency and any measures that can be adopted to prevent a reoccurrence. A copy of each report shall also be provided to Tangata Whenua and Fish & Game New Zealand (Taranaki).

7. The consent holder shall ensure that the flow in the river downstream of each take site is measured and recorded at intervals not exceeding 15 minutes to an accuracy of +10% for flows less than:

   (a) 2000 litres per second for the Tangahoe River; and
   (b) 1000 litres per second for the Tawhiti Stream.

   Advice Note:
   For the avoidance of doubt, the river flow gauging stations downstream of each take site, and any associated data telemetry, is owned and operated by the Taranaki Regional Council. This flow data shall be provided to the consent holder so it can manage the takes from each take site in accordance with the conditions of this consent.

Installation of Monitoring Equipment and Screens

8. Before exercising this consent the consent holder shall:

   (a) install, and thereafter maintain a water meter and a datalogger at each site of taking (or a nearby site in accordance with Regulation 10 of the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*. Water meters and dataloggers shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of ± 5% at intervals not exceeding 15 minutes;

   (b) install, and thereafter maintain equipment that records the turbidity of the Tangahoe River at the take site to an accuracy of ± 5% at intervals not exceeding 15 minutes;

9. Within two years of the commencement date of this consent, the consent holder shall install screens on each water intake structure for the purpose of preventing fish from entering the intake. The screens shall have a mesh aperture not exceeding 2 mm and the sweep velocity shall exceed the approach velocity.

10. Within 30 days of the commencement date of this consent, the consent holder shall provide the Taranaki Regional Council with a document from a suitably qualified person certifying that the water meter and datalogger at each site of taking required by condition 8(a) of this consent:

    (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 ± 5%.

    The documentation shall also be provided:

    (c) at other times when reasonable notice is given by the Chief Executive, Taranaki Regional Council who has reasonable evidence that the equipment may not be functioning as required by this consent; and
    (d) no less frequently than once every five years.

Monitoring and Management Plans

11. The consent holder shall prepare, implement and comply with its obligations under all plans required by the conditions of this consent.

Tangata Whenua Involvement Plan

12. Within 3 months of the commencement date of this consent, the consent holder shall prepare and submit to the Taranaki Regional Council a Tangata Whenua Involvement Plan ("TWIP"). The TWIP shall be developed in consultation with Te Runanga o Ngati Ruanui Trust and Te Korowai o Ngaruahine Trust (collectively referred to as "Tangata Whenua" for the purposes of this consent).

13. The purpose of the Plan is to recognise Tangata Whenua's kaitiakitanga responsibilities and to identify the process and extent of involvement by Tangata Whenua in:

    (a) the development, implementation and review of the Monitoring Plan (condition 16) and Water Efficiency BPO Report (condition 24);
    (b) the development and implementation of environmental enhancement projects in accordance with condition 25.
    (c) monitoring the conditions of this consent.
    (d) the establishment of a Kaitiaki Group.

14. As a minimum the TWIP shall detail:

    (a) *Development of Plans* - A process for Tangata Whenua to have input into and provide feedback to the consent holder and Taranaki Regional Council on the development of the Monitoring Plan (condition 16) and Water Efficiency BPO Report (condition 24) prior to each being lodged with the Taranaki Regional Council.

    (b) *Implementation and review of Plan*s - A process for Tangata Whenua to have input into and provide feedback on the implementation and reviews of:
        (i) the Monitoring Plan;
        (ii) monitoring of the effects of the takes;
        (iii) the Annual Performance and Data Summary Reports; and
        (iv) the Water Efficiency BPO Report.

    (c) *Information Sharing* - A process for ongoing information sharing between Tangata Whenua and the consent holder to enable an improved understanding of the relevant cultural values that may be affected by the activities authorised by this consent and the traditional/cultural uses of the Tawhiti Stream and Tangahoe River.

    (d) *Kaitiaki Group* - A process to establish and maintain a Kaitiaki Group (KG), which shall include:
        (i) the process by which the Taranaki Regional Council, Te Runanga o Ngati Ruanui Trust, Te Korowai o Ngaruahine Trust and the consent holder will be invited to become members of the KG;
        (ii) the process by which membership may be amended and advisers appointed and/or engaged by the KG;

(iii) the terms of reference for the KG, which shall be:
- the conditions of this consent and their implementation; and
- the environmental enhancement projects to be carried out pursuant to condition 25;

(iv) the way the KG will operate, including frequency of meetings and methods of communication between members; and

(v) the reasons the KG may cease to function and the process for that.

15. The consent holder may review and amend the TWIP from time to time in consultation with Tangata Whenua. A copy of the amended plan shall be provided to the Taranaki Regional Council.

Monitoring Plan

16. Within 6 months of the date of commencement of this consent, the consent holder shall ensure a Monitoring Plan is prepared. The purpose of the Monitoring Plan is to identify the techniques, methodologies and procedures that will be employed to acquire data in relation to, and monitor compliance with the conditions of this consent, and the effects of the taking authorised by this consent on:

(a) instream habitat values and macroinvertebrate communities within the Tawhiti Stream and Tangahoe River; and

(b) native fish populations within the Tawhiti Stream and Tangahoe River.

Advice Note:
The Taranaki Regional Council assumes responsibility for the preparation and implementation of the Monitoring Plan for annual compliance purposes.

17. The consent holder shall provide a copy of the Monitoring Plan to Fish and Game New Zealand for comment prior to it being approved by the Taranaki Regional Council.

18. At all times, the consent holder shall implement and comply with those aspects of the Monitoring Plan that the consent holder is responsible for (as detailed in the Monitoring Plan).

Low Flow Contingency Plan

19. Within 6 months of the commencement date of this consent, the consent holder shall prepare a Low Flow Contingency Plan and provide a copy of the plan to the Taranaki Regional Council, Tangata Whenua and Fish and Game New Zealand. The purpose of the Low Flow Contingency Plan is to identify the techniques, methods and procedures that will be employed by the consent holder to reduce the amount of water taken from the Tawhiti Stream and Tangahoe River to the greatest extent that is practicable during periods when the flow downstream of the Tangahoe River take site is between 300 litres per second and 450 litres per second and abstraction is occurring in accordance with conditions 4 and 5.

Reporting

20. Within 6 months of the commencement date of this consent, the consent holder shall begin recording turbidity, the volumes of water taken and river flow in accordance with the conditions of this consent. The records 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.

21. If any measuring or recording equipment required by the conditions of this consent, which is owned and operated by the consent holder, breaks down, or for any reason is not operational, the consent holder shall advise the Chief Executive, Taranaki Regional Council as soon as is reasonably practicable after the consent holder becomes aware of the breakdown or malfunction, by emailing hydro@trc.govt.nz. Any repairs or maintenance to the equipment must be undertaken by a suitably qualified person.

22. All measuring or recording equipment required by the conditions of this consent shall be accessible to Taranaki Regional Council officers at all reasonable times for inspection and/or data retrieval. In addition the data logger shall be designed and installed so that Taranaki Regional Council officers can readily verify that it is accurately recording the required information.

Annual Performance Data Summary Report

23. Each year by 31 August, the consent holder shall prepare an Annual Performance Data Summary Report and provide a copy of the report to the Chief Executive, Taranaki Regional Council. The Annual Performance Data Summary Report shall relate to the preceding 12 month period ending 30 June and summarise:

    (a) Data relating to the performance of major components within the water take systems and compliance with the conditions of this consent; and
    (b) Any results of monitoring undertaken in accordance with the Monitoring Plan.

Water Efficiency BPO Report

24. Before 1 June 2021 and at 5 yearly intervals thereafter, the consent holder shall undertake a water efficiency study that assesses the overall water use efficiency on site, identifies the best practicable options ("BPO") to improve water use efficiency and makes recommendations about the implementation of any BPOs. The study shall also include a review of hydrological records to determine whether the minimum flows specified in conditions 3(a), 4, 5 and 19 should be increased. The consent holder shall then prepare a Water Efficiency BPO Report which summarises the study and its findings and recommendations and provide a copy of it to the Chief Executive, Taranaki Regional Council, Tangata Whenua and Fish and Game New Zealand within 30 working days of the study being completed.

For the purposes of the consent, best practicable option means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to—

(a) the nature of the taking and the sensitivity of the receiving environment to adverse effects; and
(b) the financial implications, and the effects on the environment, of that option when compared with other options; and
(c) the current state of technical knowledge and the likelihood that the option can be successfully applied.

Financial Contributions

25. The consent holder shall make a $10,000 (plus GST and adjusted for inflation) payment to the Taranaki Regional Council for each year of this consent as a financial contribution for the purpose of mitigating the adverse environmental effects of the taking. The first payment shall be made within 30 days of the commencement date of this consent and subsequent payments shall be made annually before 1 September.

26. The contribution that is to be made in accordance with condition 25 shall only be used for specific environmental enhancement projects within the Tangahoe River catchment that have been agreed to by the Kaitiaki Group and the Chief Executive, Taranaki Regional Council including, but not limited to:

(a) Riparian planting and fencing of waterbodies;
(b) Enhancement, fencing and protection of wetlands;
(c) Enhancement of the native fishery;
(d) Enhancement of the Tangahoe River mouth/estuary; and
(e) Removal of fish barriers.

Advice Note:
If the financial contributions paid pursuant to this consent accumulate with the Taranaki Regional Council over a period of 5 years or more without being spent and/or there are no agreed projects pursuant to condition 26 that the fund is to be applied to, the consent holder may make an application under section 127 of the RMA, to change, suspend or waive the contributions required under this condition or to otherwise modify this condition.

27. Annually before 1 August the consent holder shall submit a "Financial Contribution and Environmental Enhancement Report" ("FCEER") to the Chief Executive, Taranaki Regional Council. The purpose of the FCEER shall be to document the environmental enhancement project(s) that have occurred in the previous year pursuant to conditions 26, and it shall include as a minimum:

(a) the projects initiated and completed; and
(b) the total cost of each project.

Review

28. 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 2021 and at 5-yearly intervals thereafter, 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; or

    (b) implementing a best practicable option with respect to improving water use efficiency identified in a Water Efficiency BPO Report prepared in accordance with condition 24;

    (c) increasing the flows specified in conditions 3(a), 4, 5 and 19 in accordance with any recommendation as a result of the Tangahoe River hydrological data review required by condition 24.

Signed at Stratford on 17 October 2017

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

Coastal Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	17 October 2017
Commencement Date:	8 November 2017

Conditions of Consent

Consent Granted:	To discharge all wastewater from dairy factory processes and associated processes undertaken at the Whareroa dairy processing site through a marine outfall into the Tasman Sea
Expiry Date:	1 June 2052
Review Date(s):	June 2021 and at 5-yearly intervals thereafter
Site Location:	Tasman Sea, Rifle Range Road, Hawera
Grid Reference (NZTM)	Between 1711371E-5612940N & 1710410E-5611381N
Catchment:	Tasman Sea

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

Discharge requirements

1. The discharge shall only occur through the outfall and diffuser located between the points defined by map references (NZTM) 1711371E-5612940N and 1710410E-5611381N.

2. The discharge over any 24-hour period ending at 6.00am New Zealand Standard Time (NZST) shall not exceed 40,000 cubic metres.

3. The discharge may include any wastewater from dairy factory processes and associated processes undertaken at the Whareroa dairy processing site and site stormwater, but shall not include any sewage.

4. The discharge, as determined by any 24 hour composite time-proportioned sample taken as the discharge leaves the Whareroa dairy processing site shall meet the standards below

   (a) suspended solids concentration no greater than 1,000 milligrams/litre;
   (b) total fats concentration no greater than 800 milligrams/litre; and
   (c) Chemical Oxygen Demand [COD] concentration no greater than 7000 milligrams/litre.

5. The discharge authorised by this consent shall not give rise to any of the following effects in the Tasman Sea beyond a mixing zone of 200 metres from the centre line of the outfall diffuser:

   (a) the production of conspicuous oil or grease films, scums or foams, or floatable suspended materials;
   (b) any conspicuous change in the colour or visual clarity;
   (c) any emission of objectionable odour; or
   (d) any significant adverse effects on marine life, in particular: benthic communities; and intertidal aquatic life in and around Pukeroa Reef.

6. The consent holder shall measure and record the rate and volume of wastewater discharged to an accuracy of ± 5%. Records of the date, time, rate and cumulative volume of discharge from 6.00am (NZST), taken at intervals not exceeding 15 minutes shall be transmitted to the Taranaki Regional Council's computer system within 2 hours of being recorded.

7. Before 1 August 2021 the consent holder shall install and commission a Dissolved Air Flotation Unit (DAF) to treat all wastewater from the Cream, Cheese and Milk Treatment processing plants prior to its discharge.

8. By 1 June 2022 the consent holder shall submit to the Taranaki Regional Council a report that:

   (a) summarises the performance of the DAF unit required by condition 7,including the wastewater characteristics to and discharging from the DAF unit;
   (b) summarises any change in the wastewater characteristics discharged pursuant to this consent post installation and commissioning the DAF unit; and
   (c) includes an analysis of whether it is appropriate to amend the discharge standards specified in condition 4 (a)-(c) of this consent to more accurately reflect any ongoing reductions of suspended solids, total fats or COD concentrations in the discharge which are occurring as a result of higher levels of treatment by the DAF unit, and makes any recommendations to that effect.

Monitoring and Management Plans

9. The consent holder shall prepare, implement and comply with its obligations under all plans required by the conditions of this consent.

Tangata Whenua Involvement Plan

10. Within 3 months of the commencement date of this consent, the consent holder in conjunction with South Taranaki District Council shall prepare and submit to the Taranaki Regional Council a Tangata Whenua Involvement Plan ("TWIP"). The TWIP shall be developed in consultation with Te Runanga o Ngati Ruanui Trust and Te Korowai o Ngāruahine Trust (collectively referred to as "Tangata Whenua" for the purposes of this consent).

11. The purpose of the TWIP is to recognise Tangata Whenua's kaitiakitanga responsibilities and to identify the process and extent of involvement by Tangata Whenua in:

   (a) the development, implementation and reviews of the Monitoring Plan, Contingency Plan, and Wastewater Management BPO Report;
   (b) monitoring the conditions of this consent; and
   (c) the establishment of a Kaitiaki Group.

12. As a minimum the TWIP shall detail:
   (a) *Development of Plans* - A process for Tangata Whenua to have input into and provide feedback to the consent holder and Taranaki Regional Council on the development of the Monitoring Plan (condition 14), Contingency Plan (condition 16) and Wastewater Management BPO Report (condition 18) prior to each being lodged with the Taranaki Regional Council.

   (b) *Implementation and review of Plans* - A process for Tangata Whenua to have input into and provide feedback on the implementation and reviews of:
      (i) the Monitoring Plan;
      (ii) the Contingency Plan;
      (iii) monitoring of the effects of the discharge;
      (iv) the Annual Performance and Data Summary Reports; and
      (v) Wastewater Management BPO Reports.

(c) *Information Sharing* - A process for ongoing information sharing between Tangata Whenua and the consent holder to enable an improved understanding of the relevant cultural values that may be affected by the activities authorised by this consent.

(d) *Kaitiaki Group* - A process to establish and maintain a Kaitiaki Group (KG), which shall include:
   (i) the process by which the Taranaki Regional Council, Te Runanga o Ngati Ruanui Trust, Te Korowai o Ngāruahine Trust, South Taranaki District Council and the consent holder will be invited to become members of the KG;
   (ii) the process by which membership may be amended and advisers appointed and/or engaged by the KG;
   (iii) the terms of reference for the KG, which shall be the conditions of this consent and any other consent authorising a discharge from the same outfall, and their implementation;
   (iv) the way the KG will operate, including frequency of meetings and methods of communication between members; and
   (v) the reasons the KG may cease to function and the process for that.

13. The consent holder may review and amend the TWIP from time to time in consultation with Tangata Whenua. A copy of the amended plan shall be provided to the Taranaki Regional Council.

Monitoring Plan

14. Within 6 months of the commencement date of this consent, the consent holder shall ensure a Monitoring Plan is prepared The purpose of the Monitoring Plan is to identify the techniques, methodologies and procedures that will be employed to acquire data in relation to, and to monitor compliance with the conditions of this consent, and the effects of the discharge authorised by this consent and any other consent authorising a discharge from the same outfall on:

    (a) Benthic sediments and marine ecology; and
    (b) Pukeroa Reef.

    Advice Note: *The Taranaki Regional Council assumes responsibility for the preparation and implementation of the Monitoring Plan for annual compliance purposes.*

15. At all times, the consent holder shall implement and comply with those aspects of the Monitoring Plan that the consent holder is responsible for (as detailed in the Monitoring Plan).

Contingency Plan

16. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent and remedy any environmental effects from a spillage or any discharge of contaminants not authorised by this consent. The plan and any amended versions shall be provided to the Chief Executive of the Taranaki Regional Council.

Reporting

Annual Data and Performance Report

17. Each year by 31 August, the consent holder shall prepare an Annual Data and Performance Report and forward a copy of the report to the Chief Executive, Taranaki Regional Council. The Annual Data and Performance Report shall relate to the preceding 12 month period ending 30 June and summarise:

    (a) Data relating to the performance of major components within the consent holder's wastewater system and compliance with the conditions of this consent;
    (b) Any results of monitoring undertaken in accordance with the Monitoring Plan; and
    (c) Any incidents involving spills or accidental discharges and the measures taken to avoid, remedy or mitigate the adverse environmental effects of such a spill or discharge.

Wastewater Management BPO Report

18. Before 1 June 2021 and at 5-yearly intervals thereafter, the consent holder shall provide to the Chief Executive, Taranaki Regional Council, a 'Wastewater Management BPO Report' reviewing relevant best practicable options ("BPO") in dairy wastewater management and how these might be applicable at the Whareroa site, and detailing any measures taken by the consent holder to improve or minimise the wastewater discharge.

    For the purposes of the consent, **best practicable option** means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to-

    (a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
    (b) the financial implications, and the effects on the environment, of that option when compared with other options; and
    (c) the current state of technical knowledge and the likelihood that the option can be successfully applied.

Review

19. 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 2021 and at 5-yearly interval thereafter, 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; or

    (b) implementing a best practicable option in dairy wastewater management as identified in the Wastewater Management BPO Report prepared in accordance with condition 18.

20. 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 condition 4 of this resource consent by giving notice of review within 6 months of receipt of the report required by condition 8, for the purposes of setting discharge standards more appropriate for the higher level of treatment.

Signed at Stratford on 17 October 2017

For and on behalf of
Taranaki Regional Council

_____

A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	14 February 2014
Commencement Date:	14 February 2014

Conditions of Consent

Consent Granted:	To discharge stormwater from the Whareroa milk processing site into an unnamed tributary of the Tangahoe River
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	89 Whareroa Road, Hawera
Legal Description:	Lot 1 DP 12929 Lots 1 & 2 DP 13689 Lot 1 DP 17308 Lot 1 DP 17686 Lots 1-3 DP 19722 Pt Sec 234 Blk X Hawera SD (Discharge source) Lot 2 DP 2777 Blk X Hawera SD (Discharge site)
Grid Reference (NZTM)	1711975E-5614565N
Catchment:	Tangahoe

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 consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be from a catchment area not exceeding 10 hectares.

3. Before 31 August 2014, the consent holder shall prepare and maintain a contingency plan that details measures and procedures to be undertaken to prevent spillage or any discharge of contaminants not authorised by this consent. The contingency plan shall be followed in the event of a spill or unauthorised discharge and shall be certified by the Chief Executive, Taranaki Regional Council as being adequate to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.

4. Before 31 August 2014, the consent holder shall prepare and maintain a stormwater management plan that documents how the site is to be managed to minimise the contaminants that become entrained in the stormwater. This plan shall be followed at all times, shall be certified by the Chief Executive, Taranaki Regional Council, and shall include but not necessarily be limited to:

   a) cleaning procedures for the site catchments discharging to the Eastern Pond; and
   b) details of maintenance and cleaning programmes to remove the accumulated sediment from the ponds.

   A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

5. After allowing for reasonable mixing, within a mixing zone extending 10 metres below the discharge point, the discharge shall not give rise to any of the following effects in the receiving waters:

   a. the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b. any conspicuous change in the colour or visual clarity;
   c. any emissions of objectionable odour;
   d. the rendering of fresh water unsuitable for consumption by farm animals; and
   e. any significant adverse effects on aquatic life, habitats or ecology.

6. There shall be no visible bacterial and/or fungal growths downstream of the discharge.

7. Constituents of the discharge shall meet the standards shown in the following table for eight of ten consecutive samples taken at least two weeks apart over the course of an annual monitoring period:

Constituent	Standard
Oil and grease	Concentration not greater than 5 gm^{-3}
pH	Within the range 6.0 to 9.0
Suspended solids	Concentration not greater than 30 gm^{-3}
BOD	Concentration not greater than 15 gm^{-3} for the first two years following the date of issue of this consent, and 10 gm^{-3} thereafter
Filtered carbonaceous BOD	Concentration not greater than 3.5 gm^{-3} for the first two years following the date of issue of this consent, and 2 gm^{-3} thereafter
Temperature	Not greater than 25°C
Total residual chlorine	Concentration not greater than 0.2 gm^{-3}

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

8. The consent holder shall maintain the existing fencing and planting of the riparian margins of the receiving water body for a distance of 500 metres downstream of the discharge point for the purpose of mitigating the effects of the discharge.

9. 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 2016 and/or June 2022, for the purpose of 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.

Transferred at Stratford on 13 April 2015

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	14 February 2014
Commencement Date:	14 February 2014

Conditions of Consent

Consent Granted:	To discharge stormwater, back flushing from the sand filters and intermittent discharges of treated water from a reservoir, from the Whareroa milk processing site into an unnamed tributary of the Tawhiti Stream
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	89 Whareroa Road, Hawera
Legal Description:	Lot 1 DP 12929 Lots 1 & 2 DP 13689 Lot 1 DP 17308 Lot 1 DP 17686 Lots 1-3 DP 19722 Pt Sec 234 Blk X Hawera SD (Discharge source) Pt Lot 2 DP 15204 Blk X Hawera SD (Discharge site)
Grid Reference (NZTM)	1711919E-5615318N
Catchment:	Tangahoe
Tributary:	Tawhiti

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 consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be from a catchment area not exceeding 13 hectares.

3. Before 31 August 2014, the consent holder shall prepare and maintain a contingency plan that details measures and procedures to be undertaken to prevent spillage or any discharge of contaminants not authorised by this consent. The contingency plan shall be followed in the event of a spill or unauthorised discharge and shall be certified by the Chief Executive, Taranaki Regional Council as being adequate to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.

4. Before 31 August 2014, the consent holder shall prepare and maintain a stormwater management plan that documents how the site is to be managed to minimise the contaminants that become entrained in the stormwater. This plan shall be followed at all times, shall be certified by the Chief Executive, Taranaki Regional Council, and shall include but not necessarily be limited to:

   a) cleaning procedures for the site catchments discharging to the Northern Pond; and
   b) details of maintenance and cleaning programmes to remove the accumulated sediment from the ponds.

   A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

5. After allowing for reasonable mixing, within a mixing zone extending 10 metres below the discharge point, the discharge shall not give rise to any of the following effects in the receiving waters:

   a. the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b. any conspicuous change in the colour or visual clarity;
   c. any emissions of objectionable odour;
   d. the rendering of fresh water unsuitable for consumption by farm animals; and
   e. any significant adverse effects on aquatic life, habitats or ecology.

6. There shall be no visible bacterial and/or fungal growths downstream of the discharge.

7. Constituents of the discharge shall meet the standards shown in the following table for eight of ten consecutive samples taken at least two weeks apart over the course of an annual monitoring period:

Constituent	Standard
Oil and grease	Concentration not greater than 5 gm^{-3}
pH	Within the range 6.0 to 9.0
Suspended solids	Concentration not greater than 30 gm^{-3}
BOD	Concentration not greater than 10 gm^{-3}
Filtered carbonaceous BOD	Concentration not greater than 2 gm^{-3}
Temperature	Not greater than 25°C
Total residual chlorine	Concentration not greater than 0.2 gm^{-3}

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

8. 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 2016 and/or June 2022, for the purpose of 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.

Transferred at Stratford on 13 April 2015

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date (Change):	24 July 2018
Commencement Date (Change):	24 July 2018 (Granted Date: 2 August 2017)

Conditions of Consent

Consent Granted:	To discharge emissions into the air from the manufacture and processing of milk products and associated processes
Expiry Date:	1 June 2025
Review Date(s):	June 2020
Site Location:	Whareroa Road, Hawera
Grid Reference (NZTM)	1711450E-5614870N (Powder 3) 1711600E-5614624N (DAF plant)

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 consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants into the environment from the site.

2. The measures representing the best practicable option may be reviewed in accordance with the procedure provided for in condition 16.

3. Prior to undertaking any alterations to the plant, processes or operations, as specified in the information provided in support of the original application for this consent, and with any subsequent application to change consent conditions which may significantly change the nature or quantity of contaminants emitted from the site, the consent holder shall consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act 1991 and any amendments.

4. The consent holder shall provide to the Taranaki Regional Council within five years from the granting of this consent, and every six years thereafter a written report:
   a) reviewing any technological advances in the reduction or mitigation of emissions, especially but not exclusively in respect of milk powder and other particulate emissions, how these might be applicable and/or implemented at the Whareroa site, and the costs and benefits of these advances; and
   b) detailing an inventory of emissions from the site of such contaminants as the Chief Executive, Taranaki Regional Council, may from time to time specify following consultation with the consent holder; and
   c) addressing any other issue relevant to the minimisation or mitigation of emissions from the Whareroa site that the Chief Executive, Taranaki Regional Council, considers should be included.

5. The consent holder shall be permitted to discharge into the air emissions of contaminants arising from the spray drying processes in the facilities known as WPC, Alamin, Powder-2, Powder-3, Powder-4, Powder-5, Casein-1 and Casein-2, together with other milk processing facility and supporting utility services (including the dissolved air floatation plant), as described in the information provided in support of the original application for this consent, and with any subsequent application to change consent conditions. Where there is conflict between applications the later application shall prevail, and where there is conflict between an application and consent conditions the conditions shall prevail.

6. The consent holder shall minimise the emissions and impacts of air contaminants discharged from the site by the selection of the most appropriate process equipment, process control equipment, emission control equipment, methods of control, supervision and operation, and the proper and effective operation, supervision, control and maintenance of all equipment and processes.

7. Subject to condition 8, powder emissions to the atmosphere from the spray drying process cyclone exhausts shall not exceed 125 milligrams per cubic metre (mg/m^3) of gas flow, adjusted to 0 degrees Celsius, 1 atmosphere pressure, and dry gas basis.

8. Powder emissions to the atmosphere from the Powder-3 cyclone exhausts shall not exceed 150 milligrams per cubic metre (mg/m^3) of gas flow, adjusted to 0 degrees Celsius, 1 atmosphere pressure, and dry gas basis.

9. The discharges authorised by this consent shall not give rise to suspended or deposited dust at or beyond the boundary of the site that, in the opinion of at least one enforcement officer of the Taranaki Regional Council, is offensive or objectionable. For the purposes of this condition, effects in excess of the following limits are deemed to be offensive or objectionable:

    a) deposition of milk powder equivalent to 0.13 grams total deposited milk powder per square metre per day ($g/m^2/day$); and/or
    b) a suspended milk powder level of 1 milligram per cubic metre (mg/m^3).

10. The consent holder shall control all emissions of fine particulates (PM_{10}) to the atmosphere from the site, in order that the maximum ground level concentration of fine particulates (PM_{10}) arising from the exercise of this consent measured under ambient conditions does not exceed 50 micrograms per cubic metre ($\mu g/m^3$) (twenty-four hour average), at or beyond the boundary of the site.

11. The discharges authorised by this consent shall not give rise to an odour at or beyond the boundary of the site that, in the opinion of at least one enforcement officer of the Taranaki Regional Council, is offensive or objectionable.

12. The consent holder, in conjunction with the Taranaki Regional Council, shall undertake monitoring of emissions and their effects upon the environment as required by the Chief Executive, Taranaki Regional Council.

13. The consent holder shall convene an annual meeting of representatives of the Taranaki Regional Council, and interested submitters to application 2747, to discuss any matter relating to the exercise of this consent.

14. The Powder-5 facility may process skim milk powder only if the consent holder has:

    a) given five (5) days prior notice to the Chief Executive, Taranaki Regional Council; and
    b) developed a monitoring programme for the emissions and their effects upon the environment as required by the Chief Executive, Taranaki Regional Council.

15. The Taranaki Regional Council shall, within six (6) months of notice under condition 14, serve notice that it intends to review the conditions of this consent, in accordance with section 128(1)(a) of the Resource Management Act 1991, for the purpose of dealing with any significant adverse effect on the environment arising from the use of the Powder-5 plant for skim milk powder production.

16. 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 within six months of receiving a report prepared by the consent holder pursuant to condition 4 of this consent, or in any case in June 2010 and/or June 2015 and/or June 2020, for the purposes of:

    a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered and which it is appropriate to deal with at the time of the review; and/or
    b) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge; and/or
    c) to alter, add, or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant or contaminants; and/or
    d) taking into account any Act of Parliament, regulation, national policy statement, national environmental standard, regional policy statement or regional rule which relates to limiting, recording, or mitigating airborne contaminants and which is relevant to emissions from the milk and milk product processing plants and/or associated processes.

Signed at Stratford on 24 July 2018

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date (Change):	12 January 2016
Commencement Date (Change):	12 January 2016 (Granted Date: 14 February 2014)

Conditions of Consent

Consent Granted:	To discharge stormwater, backwash and treated process water from the Whareroa milk processing site and the Water Treatment Plant into Unnamed Stream 18
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	89 Whareroa Road, Hawera
Legal Description:	Lot 2 DP 2777 Blk X Hawera SD (Discharge source) Lot 1 DP 18056 Blk X Hawera SD (Discharge site)
Grid Reference (NZTM)	1711420E-5614456N
Catchment:	Tangahoe
Tributary:	Unnamed Stream 18

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 consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The storm water, backwash and treated process water discharged shall be from a catchment area not exceeding 22 hectares.

3. Before 31 August 2014, the consent holder shall prepare and maintain a contingency plan that details measures and procedures to be undertaken to prevent spillage or any discharge of contaminants not authorised by this consent. The contingency plan shall be followed in the event of a spill or unauthorised discharge and shall be certified by the Chief Executive, Taranaki Regional Council as being adequate to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.

4. Before 31 August 2014, the consent holder shall prepare and maintain a stormwater management plan that documents how the site is to be managed to minimise the contaminants that become entrained in the stormwater. This plan shall be followed at all times, shall be certified by the Chief Executive, Taranaki Regional Council, and shall include but not necessarily be limited to:

   a) cleaning procedures for the site catchments discharging to the Western Pond; and
   b) details of maintenance and cleaning programmes to remove the accumulated sediment from the ponds.

   A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

5. Prior to commissioning the Water Treatment Plant, the consent holder shall update and maintain the stormwater management plan required under condition 4 that documents how the site is to be managed to minimise the additional contaminants that became entrained in the stormwater. This plan shall be followed at all time, shall be certified by the Chief Executive, Taranaki Regional Council, and shall include but not necessarily be limited to cleaning procedures for the site catchments discharging to the Pond.

6. After allowing for reasonable mixing, within a mixing zone extending 10 metres below the discharge point, the discharge shall not give rise to any of the following effects in the receiving waters:

   a. the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b. any conspicuous change in the colour or visual clarity;
   c. any emissions of objectionable odour;
   d. the rendering of fresh water unsuitable for consumption by farm animals; and
   e. any significant adverse effects on aquatic life, habitats or ecology.

7. There shall be no visible bacterial and/or fungal growths downstream of the discharge.

8. Constituents of the discharge shall meet the standards shown in the following table for eight of ten consecutive samples taken at least two weeks apart over the course of an annual monitoring period:

Constituent	Standard
Oil and grease	Concentration not greater than 5 gm^{-3}
pH	Within the range 6.0 to 9.0
Suspended solids	Concentration not greater than 100 gm^{-3}
BOD	Concentration not greater than 15 gm^{-3} for the first two years following the date of issue of this consent, and 10 gm^{-3} thereafter
Filtered carbonaceous BOD	Concentration not greater than 3.5 gm^{-3} for the first two years following the date of issue of this consent, and 2 gm^{-3} thereafter
Temperature	Not greater than 25ºC
Total residual chlorine	Concentration not greater than 0.2 gm^{-3}

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

9. The consent holder shall maintain the existing fencing and planting of the riparian margins of the receiving water body for a distance of 500 metres downstream of the discharge point for the purpose of mitigating the effects of the discharge.

10. 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 2016 and/or June 2022, for the purpose of 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.

Signed at Stratford on 12 January 2016

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	3 February 2004
Commencement Date:	3 February 2004

Conditions of Consent

Consent Granted:	To discharge laboratory wastes onto and into land
Expiry Date:	1 June 2022
Review Date(s):	June 2016
Site Location:	Rifle Range Road, Hawera
Legal Description:	Pt Lot 13 DP 2625 Blks IX & X Hawera SD
Grid Reference (NZTM)	1711450E-5613270N
Catchment:	Tangahoe Waihi

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

   i) the administration, monitoring and supervision of this consent; and
   ii) charges authorised by regulations.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The exercise of this resource consent shall be undertaken generally in accordance with the documentation submitted in support of application 2746. In the case of any contradiction between the documentation submitted in support of application 2746 and the conditions of this consent, the conditions of this resource consent shall prevail.

3. The discharge authorised by this consent shall not exceed 1 m^3/day.

4. The consent holder shall provide a management plan for the discharge site to the Chief Executive, Taranaki Regional Council, for written approval within three months of the granting of this consent, and regularly updated as required, to ensure that the conditions of this consent can be met, including but not limited to:

   i) means of pit excavation;
   ii) pit preparation;
   iii) dimensions of each pit;
   iv) placement and covering of wastes;
   v) stormwater control;
   vi) site control;
   vii) nature of wastes;
   viii) location of all present and previous pits; and
   ix) an outline of the site options for future pit use.

5. The siting of each discharge pit shall be to the satisfaction of the Chief Executive, Taranaki Regional Council.

6. The discharge shall not occur within 50 metres of any bore, well or spring used for water supply purposes, nor within 25 metres of any surface water body, nor within 100 metres from the coastal cliff edge.

7. The disposal pit(s) shall not intercept the water table.

8. The exercise of this consent, including the design and management of the disposal pit(s), shall not lead to or be liable to lead to contaminants entering a water body from overland surface flows.

9. The exercise of this consent shall not result in any adverse impacts on groundwater as a result of leaching, or surface water including aquatic ecosystems, and/or result in a change to the suitability of use of the receiving water as determined by the Chief Executive, Taranaki Regional Council.

10. The only wastes to be discharged shall be petri dishes, their content and the plastic which they are wrapped in.

11. The discharged material shall be covered with up to 50 millimetres of earth or other suitable cover, within a period of four hours or less following each disposal.

12. Each disposal pit shall be reinstated with a low permeability, clean, compacted soil cover with a minimum thickness of 0.5 metre to be placed over the material, and vegetation re-established to the satisfaction of the Chief Executive, Taranaki Regional Council.

13. The consent holder shall compact, contour, and maintain the cover layer of soil so as to ensure its integrity at all times to the satisfaction of the Chief Executive, Taranaki Regional Council.

14. The consent holder shall keep records of all uses of the pits including date, volume discharged, and product type, and make these available to the Chief Executive, Taranaki Regional Council, upon request.

15. 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 2010 and/or June 2016, for the purpose of 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.

Transferred at Stratford on 13 April 2015

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	17 October 2017
Commencement Date:	8 November 2017

Conditions of Consent

Consent Granted:	To discharge river silt and sand from mechanical pre-filtering of river water during abstraction of water, by returning it into the Tawhiti Stream
Expiry Date:	1 June 2052
Review Date(s):	June 2018 and at 3-yearly intervals thereafter
Site Location:	Main South Road, Hawera
Grid Reference (NZTM)	1712861E-5616233N
Catchment:	Tangahoe
Tributary:	Tawhiti

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. After allowing for reasonable mixing within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not give rise to all or any of the following effects in the receiving water of the Tawhiti Stream:

   (a) the production of any conspicuous oil or grease films, scums or foams, or
   (b) floatable or suspended materials;
   (c) any conspicuous change in the colour or visual clarity;
   (d) any emission of objectionable odour;
   (e) the rendering of fresh water unsuitable for consumption by farm animals;
   (f) any significant adverse effects on aquatic life, habitats, or ecology;
   (g) an increase in turbidity of more than 50% (as determined using NTU - nephelometric turbidity units).

2. Within 6 months of the commencement date of this consent, the consent holder shall ensure a Monitoring Plan is prepared (the "Monitoring Plan"). The purpose of the Monitoring Plan is to identify the techniques, methods and procedures that will be employed to acquire data in relation to, and monitor compliance, with:

   (a) the conditions of this consent; and
   (b) the effects of the discharge authorised by this consent on:
      (i) instream habitat values, water quality and macroinvertebrate communities within the Tawhiti Stream; and
      (ii) native fish populations within the Tawhiti Stream.

   Advice Note:
   The Taranaki Regional Council assumes responsibility for the preparation and implementation of the Monitoring Plan for annual compliance purposes.

3. At all times, the consent holder shall implement and comply with those aspects of the Monitoring Plan for which the consent holder is responsible (as detailed in the Monitoring Plan).

4. 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 2018 and at 3-yearly intervals thereafter for the purposes of 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.

Signed at Stratford on 17 October 2017

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	17 October 2017
Commencement Date:	8 November 2017

Conditions of Consent

Consent Granted:	To occupy the Coastal Marine Area with and carry out routine maintenance on: • a marine outfall pipeline and diffuser structure approximately 1845 metres long; and • a rock wall approximately 100 metres long for the protection of the outfall, stream diversion pipelines and associated structures
Expiry Date:	1 June 2052
Review Date(s):	June 2021 and at 5-yearly intervals thereafter
Site Location:	Tasman Sea, Rifle Range Road, Hawera
Grid Reference (NZTM)	Between 1711294E-5612963N & 1711437E-5612906N
Catchment:	Tasman Sea

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 to section 36 of the Resource Management Act, 1991.

Special conditions

1. The consent holder shall maintain the outfall and diffuser structures and the rock wall so that they continue to function effectively for their intended purpose.

2. The consent holder shall undertake a visual inspection of the outfall pipeline and diffuser each year. A report shall be submitted to the Taranaki Regional Council before 30 June each year (the "Annual Inspection Report") and shall include as a minimum:

   (a) the date and time of the inspection;
   (b) the condition of the outfall pipeline and diffuser; and
   (c) a description of any maintenance work required.

3. In the event, the Annual Inspection Report identifies that maintenance work is required, the consent holder shall prepare and submit to the Taranaki Regional Council a Maintenance Work Plan which describes the maintenance work to be carried out, how the work will be undertaken and the programme for completion of the work. The Maintenance Work Plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity as being adequate to ensure the maintenance works will avoid, remedy or mitigate the environmental effects of any such works, prior to any of the identified maintenance works being carried out.

4. Within 20 working days of the completion of any maintenance works being carried out in accordance with an approved Maintenance Work Plan, the consent holder shall provide written confirmation of the completion of works to the Taranaki Regional Council.

5. The outfall pipeline shall not be visible on the foreshore at any time.

6. 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 2021 and at 5-yearly intervals thereafter for the purposes of 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.

Signed at Stratford on 17 October 2017

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date (Change):	19 December 2012
Commencement Date (Change):	19 December 2012 (Granted Date: 03 February 2004)

Conditions of Consent

Consent Granted:	To discharge waste material from stormwater sumps and road sump and unprocessable dairy factory wastes onto and into land
Expiry Date:	1 June 2022
Review Date(s):	June 2016
Site Location:	Rifle Range Road, Hawera
Legal Description:	Pt Lot 13 DP 2625 Blks IX & X Hawera SD (Discharge source & site)
Grid Reference (NZTM)	1711451E-5613271N
Catchment:	Unnamed catchment 18

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

   i) the administration, monitoring and supervision of this consent; and
   ii) charges authorised by regulations.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. Wherever practicable, the consent holder shall seek to dispose of unprocessable dairy factory wastes as authorised by this consent by irrigation to land in accordance with the following application loading limits:

   Nitrogen (N) – 250 kg/ha/year

   Chemical Oxygen Demand (COD) – 4500 kg/ha/day

3. The exercise of this resource consent shall be undertaken generally in accordance with the documentation submitted in support of applications 2748, 3326 and 7284. In the case of any contradiction between the documentation submitted in support of applications 2748, 3326 and 7284 and the conditions of this consent, the conditions of this resource consent shall prevail.

4. The discharge of stormwater sump cleanings and road sump cleanings authorised by this consent shall not exceed 120 cubic metres per week. The discharge of unprocessable dairy wastes authorised by this consent shall not exceed 250 cubic metres per day.

5. The consent holder shall provide a management plan for the discharge site to the Chief Executive, Taranaki Regional Council, for written approval within three months of the granting of this consent, and regularly updated as required, to ensure that the conditions of this consent can be met, including but not limited to:

   For Pit Disposal;

   i) Means of pit excavation;
   ii) Pit preparation;
   iii) Dimensions of each pit;
   iv) Placement and covering of wastes;
   v) Stormwater control;
   vi) Site control;
   vii) Nature of wastes
   viii) Location of all present and previous pits;
   ix) An outline of site options for future pit use;

   For Irrigation Disposal;

   x) Location and area (ha) of area used for irrigation;
   xi) Volume of material applied;
   xii) Application loading rates (N and COD);
   xiii) Mitigation measures for odour control.

6. The discharge shall not occur within 50 metres of any bore, well or spring used for water supply purposes, nor within 25 metres of any surface water body, nor within 100 metres from the coastal cliff edge.

7. The disposal pit(s) shall not intercept the water table.

8. The exercise of this consent, including the design and management of the burial pit(s), shall not lead to or be liable to lead to contaminants entering a water body from overland surface flows.

9. The exercise of this consent shall not result in any adverse impacts on groundwater as a result of leaching, or surface water including aquatic ecosystems, and/or result in a change to the suitability of use of the receiving water as determined by the Chief Executive, Taranaki Regional Council.

10. Where the discharge is to pits, the discharged material shall be covered with up to 50 millimetres of earth or other suitable cover, within a period of 7 days or less following each discharge.

11. All liquid shall be removed from the disposal pit prior to the application of covering material as required in special condition 9.

12. Only those materials as authorised by this consent and outlined in applications 2748, 3326 and 7284 shall be discharged of to the disposal pits or irrigated to land. Prior to each discharge operation the consent holder shall remove all non-biodegradable material entrained in the material to be discharged, as far as is practicable to the satisfaction of the Chief Executive, Taranaki Regional Council.

13. Each disposal pit shall be reinstated with a low permeability, clean, compacted soil cover with a minimum thickness of 0.5 metre to be placed over the material, and vegetation re-established to the satisfaction of the Chief Executive, Taranaki Regional Council.

14. The consent holder shall compact, contour, and maintain the cover layer of soil so as to ensure its integrity at all times to the satisfaction of the Chief Executive, Taranaki Regional Council.

15. The disposal of wastes as authorised by this consent shall not give rise to objectionable or offensive odours beyond the property boundary.

16. The consent holder shall keep records of all discharges to land including date, volume discharged, disposal method, disposal location, product type, and the reason for discharge and make these available to the Chief Executive, Taranaki Regional Council, upon request.

17. The discharge of unprocessable dairy waste under this consent shall only occur after all other reasonable waste disposal options have been exhausted, and the consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing of the options assessed.

18. 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 2010 and/or June 2016, for the purpose of 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.

Transferred at Stratford on 13 April 2015

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	3 February 2004
Commencement Date:	3 February 2004

Conditions of Consent

Consent Granted:	To discharge emissions into the air from the disposal of laboratory wastes, and stormwater and sump cleanings onto and into land
Expiry Date:	1 June 2022
Review Date(s):	June 2016
Site Location:	Rifle Range Road, Hawera
Legal Description:	Lot 13 DP 2625 Blks IX & X Hawera SD
Grid Reference (NZTM)	1711450E-5613270N

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this resource consent.

2. The exercise of this resource consent shall be undertaken generally in accordance with the documentation submitted in support of application 2749. In the case of any contradiction between the documentation submitted in support of application 2749 and the conditions of this resource consent, the conditions of this resource consent shall prevail.

3. The consent holder shall provide a management plan for the discharge site to the Chief Executive, Taranaki Regional Council, for written approval within three months of the granting of this consent, and regularly updated as required, outlining methods to adopt the best practicable option to prevent or minimise adverse effects on the environment with respect to discharges to air.

4. That the discharges authorised by this consent shall not give rise to an odour at or beyond the boundary of the site that is offensive or objectionable.

5. For the purposes of condition 4, without restriction, an odour shall be deemed to be offensive or objectionable if:

   (a) it is held to be so in the opinion of an officer of the Taranaki Regional Council, having regard to the duration, frequency, intensity and nature of the odour; and/or
   (b) an officer of the Taranaki Regional Council observes that an odour is noticeable, and either it lasts longer than three (3) hours continuously, or it occurs frequently during a single period of more than six (6) hours; and/or
   (c) no less than three individuals from at least two different properties that are affected at the time, each declare in writing that an objectionable or offensive odour was detected beyond the boundary of the site, provided the Council is satisfied that the declarations are not vexatious and that the objectionable or offensive odour was emitted from the site as specified in (b). Each declaration shall include the individuals' names and addresses, the date and time the objectionable or offensive odour was detected, the location of the individual when it was detected and the prevailing weather conditions during the event. The declarations shall be signed and dated.

6. 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 2010 and/or June 2016, for the purpose of 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.

Transferred at Stratford on 13 April 2015

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	17 October 2017
Commencement Date:	8 November 2017

Conditions of Consent

Consent Granted:	To discharge river silt and sand from mechanical pre-filtering of river water during abstraction of water, by returning it into the Tangahoe River
Expiry Date:	1 June 2052
Review Date(s):	June 2018 and at 3-yearly intervals thereafter
Site Location:	135 Hicks Road, Hawera
Grid Reference (NZTM)	1715769E-5612503N
Catchment:	Tangahoe

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. After allowing for reasonable mixing within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not give rise to all or any of the following effects in the receiving water of the Tangahoe River:

   (a) the production of any conspicuous oil or grease films, scums or foams, or
   (b) floatable or suspended materials;
   (c) any conspicuous change in the colour or visual clarity;
   (d) any emission of objectionable odour;
   (e) the rendering of fresh water unsuitable for consumption by farm animals;
   (f) any significant adverse effects on aquatic life, habitats, or ecology;
   (g) an increase in turbidity of more than 50% (as determined using NTU - nephelometric turbidity units).

2. Within 6 months of the commencement date of this consent, the consent holder shall ensure a Monitoring Plan is prepared (the "Monitoring Plan"). The purpose of the Monitoring Plan is to identify the techniques, methods and procedures that will be employed to acquire data in relation to, and monitor compliance, with:

   (a) the conditions of this consent; and
   (b) the effects of the discharge authorised by this consent on:
      (i) instream habitat values, water quality and macroinvertebrate communities within the Tangahoe River; and
      (ii) native fish populations within the Tangahoe River.

   Advice Note:
   The Taranaki Regional Council assumes responsibility for the preparation and implementation of the Monitoring Plan for annual compliance purposes.

3. At all times, the consent holder shall implement and comply with those aspects of the Monitoring Plan for which the consent holder is responsible (as detailed in the Monitoring Plan).

4. 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 2018 and at 3-yearly intervals thereafter for the purposes of 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.

Signed at Stratford on 17 October 2017

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date (Change):	9 June 2015
Commencement Date (Change):	9 June 2015 (Granted: 7 December 2005)

Conditions of Consent

Consent Granted:	To discharge emissions into the air from dual fuel boilers (gas or coal) with a maximum energy output of 250 MW together with associated processes
Expiry Date:	1 June 2034
Review Date(s):	June 2016, June 2022, June 2028
Site Location:	Whareroa Road, Hawera
Legal Description:	Pt Lot 2 DP 15204 Lot 1 DP 15204 Lot 3 DP 19882 Blk X Hawera SD
Grid Reference (NZTM)	1711850E-5615170N

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

Best practicable option and mitigation

1. The consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants into the environment from the site.

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 2785. In the case of any contradiction between the documentation submitted in support of application 2785 and the conditions of this consent, the conditions of this consent shall prevail.

3. Other than as set out within this consent, the characteristics of any coal burned in the exercise of this consent shall be as generally described and/or achieve a similar level of environmental performance as set out in the documentation supporting the application for this consent.

4. A general outline of the methods, specifications, operating guidelines or other measures which represent the best practicable option at the time of commissioning shall be supplied by the consent holder to the Chief Executive, Taranaki Regional Council, within three months of the commissioning of the energy centre, and thereafter attached to this consent as Schedule A. Matters to be addressed in Schedule A shall include, but not be limited to: preferred fuel type and specification; air pollution abatement systems; combustion temperatures; definitions of 'cold start' and 'warm start'; measures to be used in the case of sudden loss of boiler capacity; minimum operating temperatures for baghouses; air fuel ratios; discharge (stack exit) velocities; and protocols for measuring the sulphur content of fuel on an on-going basis. This schedule can be amended by the consent holder at any time during the term of this consent to reflect changes in the methods, specifications, operating guidelines or other measures.

5. The measures representing the best practicable option may be reviewed in accordance with the procedure provided for in condition 29.

6. The consent holder shall minimise the emissions and impacts of air contaminants discharged from the site by the selection of the most appropriate process equipment, process control

equipment, emission control equipment, methods of control, supervision and operation, and the proper and effective operation, supervision, control and maintenance of all equipment and processes.

7. The minimum height of discharges to the atmosphere from the energy centre boiler stack shall be 60 metres above the ground level prevailing at the time of lodging the application for this consent.

8. Prior to undertaking any alterations to the plant, processes or operations, as specified in application 2785, which may significantly change the nature or quantity of contaminants emitted from the site, the consent holder shall consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act 1991 and any amendments.

Emission limits

9. Discharges to the atmosphere from the energy centre boiler stack shall not exceed 20% obscuration, as measured by the photoelectric obscuration gauge and corrected for path length and temperature as set out in Addendum No. 1 (1972) to 2BS2742:1969, or any replacement measurement standard, for any continuous period of 2 minutes or for more than 4 minutes cumulative in any 60 minute period, except:

   (a) for up to 120 hours (cumulative) per boiler for initial commissioning of each boiler; and

   (b) for up to 250 hours (cumulative) per year for the purpose of lighting up all boilers from cold; and

   (c) for up to 100 hours (cumulative) per year for the purpose of lighting up all boilers from warm.

10. Discharges to the atmosphere of particulate from the energy centre boiler stack shall not exceed 100 milligrams per cubic metre (mg/Nm^3) adjusted to 12% carbon dioxide (CO_2) on a dry gas basis, except during those circumstances described in special condition 9(a), 9(b), and 9(c).

11. The sum of all discharges to the atmosphere of sulphur dioxide from the energy centre boiler stack shall not exceed 385 kilograms per hour (kg/hr).

12. The sum of all discharges to the atmosphere of particulate from the energy centre boiler stack shall not exceed 43 kilograms per hour (kg/hr).

13. The sum of all discharges to the atmosphere of nitrogen oxides from the energy centre boiler stack shall not exceed 319 kilograms per hour (kg/hr).

Ambient and workplace limits

14. The consent holder shall control all discharges of sulphur dioxide to the atmosphere from the site, in order that the maximum ground level concentration of sulphur dioxide arising from the exercise of this consent measured under ambient conditions on land does not exceed 350 micrograms per cubic metre (one-hour average exposure) or 120 micrograms per cubic metre (twenty-four hour average exposure) at or beyond the boundary of the site.

15. The consent holder shall control all discharges of nitrogen dioxide or its precursors to the atmosphere from the energy centre boiler stack, whether alone or in conjunction with any other discharges to the atmosphere from the site, in order that the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 200 micrograms per cubic metre (one hour average exposure), or 100 micrograms per cubic metre (twenty-four hour average exposure), at or beyond the boundary of the site.

16. The consent holder shall control all discharges of particulate of effective diameter of less than 10 micrometres (PM_{10}) to the atmosphere from the energy centre boiler stack, whether alone or in conjunction with any other discharges to the atmosphere from the site, in order that the maximum ground level concentration of PM_{10} arising from the exercise of this consent measured under ambient conditions does not exceed 50 micrograms per cubic metre (twenty-four hour average exposure), at or beyond the boundary of the site, or at points within the site boundary where non-occupational exposure is likely to occur (such as residential dwellings).

17. The consent holder shall control all discharges of metals to the atmosphere from the energy centre boiler stack, whether alone or in conjunction with any other discharges to the atmosphere from the site, in order that the maximum ground level concentration of each or any metal arising from the exercise of this consent measured under ambient conditions does not exceed their respective guideline value set out in the 'Ambient Air Quality Guidelines 2002 Update', Air Quality Report No 32, Prepared by the Ministry for the Environment and the Ministry of Health, May 2002.

18. The consent holder shall control discharges to the atmosphere from the energy centre boiler stack of contaminants other than carbon dioxide and those addressed in conditions 10 to 17 above, whether alone or in conjunction with any discharges to the atmosphere from the site, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundary of the site, is not increased above background levels:

    (a) by more than $1/30^{th}$ of the relevant Workplace Exposure Standard-Time Weighted Average, or by more than the Workplace Exposure Standard-Short Term Exposure Limit at any time (all terms as defined in Workplace Exposure Standards, 2002, Department of Labour); or

    (b) if no Short Term Exposure Limit is set, by more than the General Excursion Limit at any time (all terms as defined in Workplace Exposure Standards, 2002, Department of Labour).

19. The discharges authorised by this consent shall not give rise to any direct significant adverse ecological effect on any ecosystems in the Taranaki region, including but not limited to habitats, plants, animals, microflora and microfauna.

Recording and reporting

20. Analysis of the coal (including but not limited to the sulphur and ash content of the coal) shall be undertaken on a monthly basis during the processing season. This shall be undertaken upon the coal blend that is supplied to the consent holder. The sampling of the coal blend shall be a composite sample generated by daily sub-sampling of the coal blend that is delivered to the consent holder. The information shall be provided to the Chief Executive, Taranaki Regional Council, upon request.

21. The consent holder shall install, operate, maintain and calibrate:

    (a) opacity meters;
    (b) sulphur dioxide meters;
    (c) temperature meters;
    (d) oxygen meters; and
    (e) carbon monoxide meters.

    for the measuring and recording of the respective parameters in the discharge stack from the boilers, to the satisfaction of the Chief Executive, Taranaki Regional Council.

22. The consent holder shall annually undertake source emission monitoring to the satisfaction of the Chief Executive, Taranaki Regional Council. The monitoring shall include a determination of the exhaust concentrations of sulphur dioxide, total suspended particulates, and PM_{10} particulates, in the manner set out in condition F1 within the application lodged for this consent, or to an equivalent standard. In addition, the consent holder shall monitor for mercury and arsenic, and the temperatures of the exhaust gases together with the generation loads prevailing at the time giving rise to those concentrations and mass emissions as determined in monitoring of the emissions. The results of the monitoring shall be provided to the Chief Executive, Taranaki Regional Council, and shall be made available annually to those invited to the liaison meeting convened under special condition 27.

23. A monitoring programme agreed between the consent holder and the Taranaki Regional Council, and provided to the Taranaki District Health Board and interested submitters to application 2785, shall be prepared within three months of the granting of this consent. The monitoring programme shall cover (at a minimum): monitoring for ground level ambient concentrations of sulphur dioxide; soil and vegetation levels of mercury, arsenic, and sulphates at reference sites; levels of mercury and arsenic within aquatic species; and a model validation monitoring survey for PM_{10} (monitoring to be carried out to a recognised standard, by an accredited laboratory).

24. The consent holder shall provide to the Chief Executive, Taranaki Regional Council, within two years from the granting of this consent and again at four years from the granting of this consent and every six years thereafter a written report:

    (a) reviewing any technological advances in the reduction or mitigation of emissions, especially but not exclusively in respect of sulphur dioxide, dioxins, and heavy metals, how these might be applicable and/or implemented at the energy centre, and the costs and benefits of these advances; and

    (b) addressing any other issue relevant to the minimisation or mitigation of emissions from the site that the Chief Executive, Taranaki Regional Council, reasonably considers should be included.

25. The consent holder shall provide to the Chief Executive, Taranaki Regional Council, within twelve months from the exercising of this consent and again every 12 months thereafter while the consent is being exercised, a written report:

    (a) detailing an inventory of emissions from the site of such contaminants as the Chief Executive, Taranaki Regional Council, may from time to time specify (in accordance with the emissions identified in the application) following consultation with the consent holder;

    (b) detailing any measures that have been taken by the consent holder to improve the energy efficiency of the energy centre; and

    (c) detailing average sulphur content and maximum sulphur content (based on monthly analyses of daily representative samples) of all fuel consumed at the site and volume of fuel consumed, during the previous twelve months.

26. The consent holder shall develop or procure a cultural impact report within 12 months of the granting of this consent.

Liaison meeting

27. The consent holder shall invite staff of the Taranaki Regional Council and interested submitters to application 2785 to meet annually to discuss any matter relating to the exercise of this consent. The first liaison meeting shall be held within 12 months of the commissioning of the energy centre.

Lapse and review

28. This consent shall lapse on 1 June 2034, 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.

29. 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 within two months of receiving a report prepared by the consent holder pursuant to conditions 24, 25, and 26 of this consent, or following non-compliance with special condition 14, or in any case in June 2010 and/or June 2016 and/or June 2022 and/or June 2028, for the purposes of:

    (a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was either not foreseen at the time the application was considered or which it is appropriate to deal with at the time of the review;

    (b) requiring the holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge;

    (c) altering, adding, or deleting limits on discharge, receiving environment or ambient concentrations of any contaminant or contaminants, for the purpose of dealing with any significant adverse ecological effect on any ecosystem; or

    (d) taking into account any Act of Parliament, regulation, national policy statement or national environmental standard which relates to setting maximum discharge or ambient concentrations of any air contaminant, and/or limiting, recording, or mitigating emissions of carbon dioxide, PM_{10} particulate, heavy metals, sulphur dioxide, and/or nitrogen dioxide, and which is relevant to the air discharge from the consent holder's energy centre if it is the express intention of any such mechanism to apply retrospectively to existing activities.

Signed at Stratford on 9 June 2015

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640	
Decision Date (Change):	23 October 2018	
Commencement Date (Change):	23 October 2018	(Granted Date: 4 October 2006)

Conditions of Consent

Consent Granted:	To discharge emissions into the air from 'Cogen-I' and 'Cogen-II' co-generation energy generating plants with an energy output of 70 MW together with associated processes
Expiry Date:	1 June 2025
Review Date(s):	June 2020
Site Location:	Whareroa Road, Hawera
Grid Reference (NZTM)	1711450E-5614870N

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 consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants into the environment from the site.

2. The measures representing the best practicable option may be reviewed in accordance with the procedure provided for in condition 19.

3. Prior to undertaking any alterations to the plant, processes or operations, as specified in the original application and any subsequent applications to change consent conditions which may significantly change the nature or quantity of contaminants emitted from the site, the consent holder shall consult with the Chief Executive, and shall obtain any necessary approvals under the Resource Management Act 1991 and any amendments.

4. The consent holder shall provide to the Taranaki Regional Council within five years from the granting of this consent and every six years thereafter a written report:
   a) reviewing any technological advances in the reduction or mitigation of emissions, how these might be applicable and/or implemented at the Whareroa site, and the costs and benefits of these advances; and
   b) detailing an inventory of emissions from the site of such contaminants as the Chief Executive, may from time to time specify following consultation with the consent holder; and
   c) detailing any measures that have been taken by the consent holder to improve the energy efficiency of the Whareroa site; and
   d) addressing any other issue relevant to the minimisation or mitigation of emissions from the Whareroa site that the Chief Executive considers should be included.

5. The boilers shall only be heated using natural gas, except that diesel may be used in the following circumstances:
   a) for temporary emergency heat/steam supply in the event of natural gas supply interruption; and
   b) for short duration testing purposes.

6. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing on each occasion that diesel combustion is used in the co-generation plants. The notification shall include the date and duration of the activity, the reason for the use of diesel, and shall be emailed to worknotification@trc.govt.nz.

7. Diesel combusted in the boilers shall comply with Schedule 2 of the Engine Fuel Specifications regulations 2011, or subsequent amendments.

8. The consent holder shall control all emissions of sulphur dioxide to the atmosphere from the site, in order that the maximum ground level concentration of sulphur dioxide arising from the exercise of this consent measured under ambient conditions on land does not exceed 350 micrograms per cubic metre (one-hour average exposure) or 125 micrograms per cubic metre (twenty-four hour average exposure) at or beyond the boundary of the site.

9. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the site, in order that the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 milligrams per cubic metre (mg/m^3) (eight- hour average exposure), or 30 milligrams per cubic metre (mg/m^3) (one-hour average exposure) at or beyond the boundary of the site.

10. The sum of all discharges to the atmosphere of nitrogen oxides from the cogeneration plant shall not exceed 48 grams per second (g/s).

11. The consent holder shall control all emissions of nitrogen dioxide or its precursors to the atmosphere from the site, so as to ensure that the maximum ground level concentration of nitrogen dioxide measured under ambient conditions does not exceed 200 micrograms per cubic metre ($\mu g/m^3$) (one-hour average), or 100 micrograms per cubic metre ($\mu g/m^3$) (twenty-four hour average), at or beyond the boundary of the site.

12. The consent holder shall control all emissions of fine particulates (PM_{10}) to the atmosphere from the site, in order that the maximum ground level concentration of fine particulates (PM_{10}) arising from the exercise of this consent measured under ambient conditions does not exceed 50 micrograms per cubic metre ($\mu g/m^3$) (twenty-four hour average), at or beyond the boundary of the site.

13. The consent holder shall control all emissions to the atmosphere from the site of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundary of the site is not increased above background levels:

    a) by more than $1/30^{th}$ of the relevant Workplace Exposure Standard-Time Weighted Average, or by more than the Workplace Exposure Standard Short Term Exposure Limit at any time (all terms as defined in Workplace Exposure Standards, 2002, Department of Labour); or
    b) if no Short Term Exposure Limit is set, by more than the General Excursion Limit at any time (all terms as defined in Workplace Exposure Standards, 2002, Department of Labour).

14. The minimum height of discharge of products of combustion from the Cogen I plant shall be 15 metres above ground level, and from Cogen II plant shall be 17.5 metres above ground.

15. The consent holder shall minimise the emissions and impacts of air contaminants discharged from the site by the selection of the most appropriate process equipment, process control equipment, emission control equipment, methods of control, supervision and operation, and the proper and effective operation, supervision, control and maintenance of all equipment and processes.

16. The consent holder, in conjunction with the Taranaki Regional Council, shall undertake monitoring of emissions and their effects upon the environment as required by the Chief Executive.

17. Notwithstanding conditions 1 and 15 above, the co-generation plants shall not be operated so as to generate emissions of visible smoke, nor shall any plume of visible water vapour from the cooling towers cross the boundary of the site.

18. The water treatment regime used in the cooling water system associated with Cogen I and Cogen II shall be to the satisfaction of the Chief Executive.

19. 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 within six months of receiving a report prepared by the consent holder pursuant to condition 4 of this consent, or in any case in June 2010 and/or June 2015 and/or June 2020, for the purposes of:

    a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered and which it is appropriate to deal with at the time of the review; and/or
    b) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge; and/or
    c) to alter, add, or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant or contaminants; and/or
    d) taking into account any Act of Parliament, regulation, national policy statement, regional policy statement or regional rule which relates to limiting, recording, or mitigating products of combustion and which is relevant to emissions from the co-generation plants.

Signed at Stratford on 23 October 2018

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	31 March 2009
Commencement Date:	31 March 2009

Conditions of Consent

Consent Granted:	To discharge emissions into the air from the combustion of waste wood packaging
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	Rifle Range Road, Hawera
Legal Description:	Pt Lot 13 DP 2625 Blks IX & X Hawera SD
Grid Reference (NZTM)	1711447E-5613278N

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. The consent only authorises the combustion of untreated timber packing waste originating from the Whareroa Dairy Factory site.

2. The total volume of waste that can be burned in calendar month shall not exceed 4 cubic metres.

3. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent by ensuring proper and effective methods of control and supervision of the discharge at all times.

4. The consent holder, prior to lighting any fire, shall have regard to wind direction and speed so as to minimise adverse effects upon neighbours. No burning shall occur during foggy conditions.

5. The discharges authorized by this consent shall not give rise to a level of a contaminant or contaminants at or beyond the boundary of the site that is noxious or toxic.

6. The discharges authorized by this consent shall not give rise to an odour at or beyond the boundary of the site that is offensive or objectionable.

7. The consent holder shall maintain a record of each burning event, including: the date, time and duration; the wind conditions [strength and direction] over the duration of the burning; any problems or issues that occurred; and details of any complaints received about the burning. This record shall be made available to the Chief Executive, Taranaki Regional Council upon request.

8. This consent shall lapse on 31 March 2014, 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.

9. 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 2016 and/or June 2022 for the purpose or purposes of 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.

Transferred at Stratford on 13 April 2015

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	03 June 2014
Commencement Date:	03 June 2014

Conditions of Consent

Consent Granted:	To discharge dairy liquids onto land and the associated emissions to air, in various locations throughout the Taranaki region
Expiry Date:	01 June 2034
Review Date(s):	June 2017, June 2020, June 2023, June 2026, June 2029, June 2032
Site Location:	Various locations throughout the Taranaki region
Legal Description:	Various locations throughout the Taranaki region
Grid Reference (NZTM)	Various locations throughout the Taranaki region
Catchment:	Various locations throughout the Taranaki region

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 dairy liquids to be discharged shall be limited to the following:

   (a) ***Dairy by-products***, which typically include, but are not limited to biomass or biosolids (drawn off from biological treatment plants); unused intermediate product of residue streams (such as stockfood and whey) and dissolved air flotation (DAF) sludge (fat and protein skimmed off liquid streams);

   (b) ***Unprocessable dairy products***, which typically include, but are not limited to silo and tank sediments; raw milk not accepted at the manufacturing site and other dairy products either contaminated or unfit for further processing; and

   (c) ***Surplus dairy products***, such as raw milk, permeate (PM18 and PM30) and buttermilk (including secondary skim and beta serum) that the consent holder is unable to process.

2. The exercise of this consent shall be in accordance with a Dairy Liquids Spreading Management Plan (DLSMP), prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The DLSMP shall detail how the discharge activity will be managed to achieve compliance with the conditions of this consent and shall include, but not limited to, the following:

   (a) storage of dairy liquids;
   (b) designated application areas and buffer zones for streams and property boundaries;
   (c) selection of appropriate irrigation methods for different types of terrain;
   (d) application rate and duration;
   (e) application frequency and nitrogen loading rate;
   (f) farm management and operator training;
   (g) soil and herbage management;
   (h) prevention of runoff and ponding;
   (i) minimisation and control of odour and spray drift effects off site;
   (j) operational control and maintenance of the spray irrigation system;
   (k) monitoring of the effluent (physicochemical);
   (l) recording of application sites, discharge volumes, rates, frequency, duration, dates and equipment operator details;
   (m) remediation measures;
   (n) mitigation measures including screening of any storage facilities and riparian planting;
   (o) reporting monitoring data;
   (p) procedures for responding to complaints; and
   (q) notification to the Taranaki Regional Council of non-compliance with conditions of this consent.

3. Before July 15 each year, the consent holder shall notify the Taranaki Regional Council, by sending an email to worknotification@trc.govt.nz of the intent to discharge dairy liquids to land, including details of the locations and Farm IDs onto which the discharges will occur (as shown in the register). If dairy liquids are subsequently intended to be discharged onto any other land in that season, the consent holder shall notify the Taranaki Regional Council of that intention at least 2 working days in advance of such discharge occurring.

4. The discharge shall not result in any liquids ponding for more than 30 minutes.

5. The discharge shall not result in any liquids reaching surface water, any subsurface drainage system or any adjacent property.

6. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

7. There shall be no spray drift as a result of the irrigation of dairy liquids at or beyond the boundary of the property or properties on which spray irrigation is occurring.

8. The dairy liquids for discharge shall not have a sodium adsorption ratio (SAR) exceeding 15.

9. The nitrogen loading rate on land irrigated with dairy liquids, as a consequence of:

   (a) the exercise of this consent; and/or
   (b) the disposal of dairy farm effluent; and/or
   (c) the disposal of any other waste or fertilizer;

   shall not exceed a combined total of:

   (d) 200 kilograms of nitrogen per hectare per year on land used for grazing; or
   (e) 300 kilograms of nitrogen per hectare per year where a crop such as maize, silage or hay is harvested from the land in the same season that dairy liquids are applied.

10. The discharge shall not occur within the following minimum buffer distances:

    (a) 25 metres from the banks of any watercourse;
    (b) 20 metres from any public road;
    (c) 20 metres from any property boundary, unless the written approval of the adjoining occupier has been obtained to allow the discharge at a lesser distance;
    (d) 50 metres from any bore, well or spring used for water supply purposes;
    (e) 150 metres from any dwelling house or place of public assembly unless the written approval of the occupier has been obtained to allow the discharge at a lesser distance; and
    (f) 300 metres from any school property.

11. There shall be no discharge within, adjacent to or directly impacting on any Statutory Acknowledgment Area.

12. There shall be no offensive or objectionable odour at or beyond the boundary of the property or properties on which a discharge occurs.

13. The consent holder shall notify the Taranaki Regional Council as soon as practicable and, as a minimum, within 48 hours, of any accidental discharge, equipment breakdown or other event which is likely to result in a breach of the conditions of this consent.

14. The consent holder shall maintain a complaints register for all aspects of the dairy liquids application activity. The register shall detail the date, time and type of complaint, cause of the complaint and action taken by the consent holder in response to the complaint. The register shall be available to the Taranaki Regional Council at all reasonable times. The consent holder shall forward a copy of each complaint received regarding odour, runoff or spray drift to the Taranaki Regional Council as soon as practicable but in any event within 48 hours of the complaint being made.

15. If, as a consequence of the activities authorised by these consents, an event occurs that may have a significant adverse effect on water quality at any registered drinking-water supply abstraction point, the consent holder shall, as soon as reasonably practicable, telephone the Taranaki Regional Council and the water supply operator and notify them of the event.

16. The consent holder shall keep a record of the application sites for the discharge of dairy liquids, including , but not limited to the following information:

    (a) Type/characteristics of dairy liquids discharged;
    (b) Date of discharge;
    (c) Time/ duration of discharge;
    (d) Volume and rate of discharge;
    (e) Method of discharge;
    (f) Name of equipment operator; and
    (g) Location of the nearest watercourse, bore, property boundary; dwelling house; school, community halls, marae, and public road.

    This record shall be kept and made available to the Chief Executive, Taranaki Regional Council, on request.

17. The following details of all farms used for dairy liquids spreading shall be recorded in a Farm Register, which shall be submitted to the Taranaki Regional Council:

    (a) Name of the farm/property;
    (b) Owner of the property;
    (c) Physical address, Legal description and NZTopo50 map reference;
    (d) Area available for irrigation (ha);
    (e) General soil type, if known;
    (f) Distance to any sensitive neighbours if closer than 300 metres from the farm, e.g. schools, community halls, marae.

    Any new farms that become available for dairy liquids spreading shall be added the Farm Register, and the updated Register shall be provided to the Taranaki Regional Council.

18. This consent shall lapse on 30 June 2019, unless the consent is given effect to before the end of that period, of the Taranaki Regonal Council fixes a longer period pursuant to Section 125(1)(b) of the Resource Management Plan 1991.

19. 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 2017 and/or June 2020, and/or June 2023, and/or June 2026, and/or June 2029, and/or June 2032 for the purpose of 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.

Signed at Stratford on 03 June 2014

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Land Use Consent

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

Name of Consent Holder:	Fonterra Limited PO Box 444 Hawera 4640
Decision Date:	25 February 2016
Commencement Date:	25 February 2016

Conditions of Consent

Consent Granted:	To construct, place and use a water intake structure in the bed of the Tangahoe River for industrial water supply purposes, including associated discharge of construction stormwater from the site
Expiry Date:	1 June 2034
Review Date(s):	June 2022, June 2028
Site Location:	135 Hicks Road, Hawera
Legal Description:	Lot 2 DP 372563 (Site of structure)
Grid Reference (NZTM)	1715770E-5612494N
Catchment:	Tangahoe

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 water intake structure shall be constructed in accordance with information provide with the application, specifically:
   - The Assessment of Environmental effects prepared by *Planz Consultants Limited*, referenced *14425* and dated *December 2015*;
   - *Intake Screen Concept Plans* prepared by *Beca Consultants Limited*, referenced *3253783-CE*, drawing numbers *5000; 5001 & 5002* and dated *16/11/15*; and
   - *Fonterra Water Intake – Tangahoe Stream Crossing Sections*, prepared by *BTW Consultants Limited*, drawing number and dated *19/01/15*.

   In the case of any contradiction between the drawing(s) and the conditions of this consent, the conditions of this consent shall prevail.

2. Prior to the commencement of the works, the consent holder shall install suitable signage at the upstream and downstream approach of the site, advising the public of the potential navigation hazard. The signage shall be maintained throughout the life of the water-intake structure.

3. Before commencing any earthworks, the consent holder shall ensure that they (or their representatives) meet on site with a Taranaki Regional Council officer who is directly responsible for monitoring compliance with the conditions of this consent. The purpose of the meeting shall be to obtain specific advice from the Taranaki Regional Council about the measures required to ensure compliance with conditions 5 and 6.

4. The consent holder shall ensure that prior to the commencement of earthworks, the erosion control measures are installed in accordance with the *Erosion and Sediment Control Plan* prepared by *Fulton Hogan Limited*, titled, *Tangahoe Intake Upgrade: Erosion and Sediment Control: Stream Control / Construction Methodology*, referenced *ESC #001* and dated *25 January 2016*.

5. The sediment control measures necessary to comply with the conditions of this consent shall be constructed before soil is exposed at the site and shall remain in place, in respect of any particular area, until that area is stabilised. The obligation described in this condition shall cease to apply, and accordingly the erosion and sediment control measures may be removed, in respect of any particular area only when the site is stabilised.

   Note: For the purpose of conditions 5 and 6, 'stabilised' in relation to any site or area means inherently resistant to erosion or rendered resistant, such as by using rock or by the application of basecourse, colluvium, grassing, mulch, or another method to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council and as specified in the Taranaki Regional Council's Guidelines for Earthworks in the Taranaki Region, 2006. Where seeding or grassing is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once, on reasonable visual inspection by an officer of the Taranaki Regional Council, an 80% vegetative cover has been established.

6. All earthworked areas shall be stabilised vegetatively or otherwise as soon as is practicable and no longer than 6 months after the completion of soil disturbance activities.

7. At least 7 working days prior to the commencement of works the consent holder shall notify the Taranaki Regional Council of the proposed start date for the work. Notification shall include the consent number and a brief description of the activity consented and shall be emailed to worknotification@trc.govt.nz.

8. Any concrete work carried out in the river bed shall be completely separated from running water, by a temporary coffer-dam and/or diversion using sand bags or some other form of contained fill.

9. The consent holder shall ensure that any concrete placed in the channel is not exposed to flowing water for a period of 48 hours after it has been placed.

10. The consent holder shall ensure that the placement of the bank protection structures (gabions and/or mass block) proposed in Stage 3 of the Erosion and Sediment Control Plan (ESCP) is undertaken when the coffer dam proposed under Stage 2 of the ESCP is in place. The bank protection structures shall be embedded in the bed of the stream by at least 500 mm.

11. No instream works shall take place between 1 May and 31 October inclusive.

12. The consent holder shall ensure that the area and volume of stream bed disturbance is, as far as practicable, minimised and any areas that are disturbed are, as far as practicable, reinstated.

13. The consent holder shall take all reasonable steps to:

    a. minimise the amount of sediment discharged to the stream;
    b. minimise the amount of sediment that becomes suspended in the stream; and
    c. mitigate the effects of any sediment in the stream.

14. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.

15. During the exercise of this consent, and on completion of the works, no stockpiles, mounds, depressions, trees/vegetation, holes or surplus material shall be left in a position where it may adversely affect the flow of water.

16. On completion of works, the banks of the Tangahoe River shall be no steeper than the existing natural banks. Where the bank consists of fill, the fill must be well compacted with batter slopes no steeper than 2 horizontal to 1 vertical.

17. The works shall remain the responsibility of the consent holder and be maintained so that any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out as part of this consent is remedied by the consent holder.

18. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

19. This consent shall lapse on 31 March 2021, 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.

20. 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 2022 and/or June 2028, for the purpose of 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.

Signed at Stratford on 25 February 2016

For and on behalf of
Taranaki Regional Council

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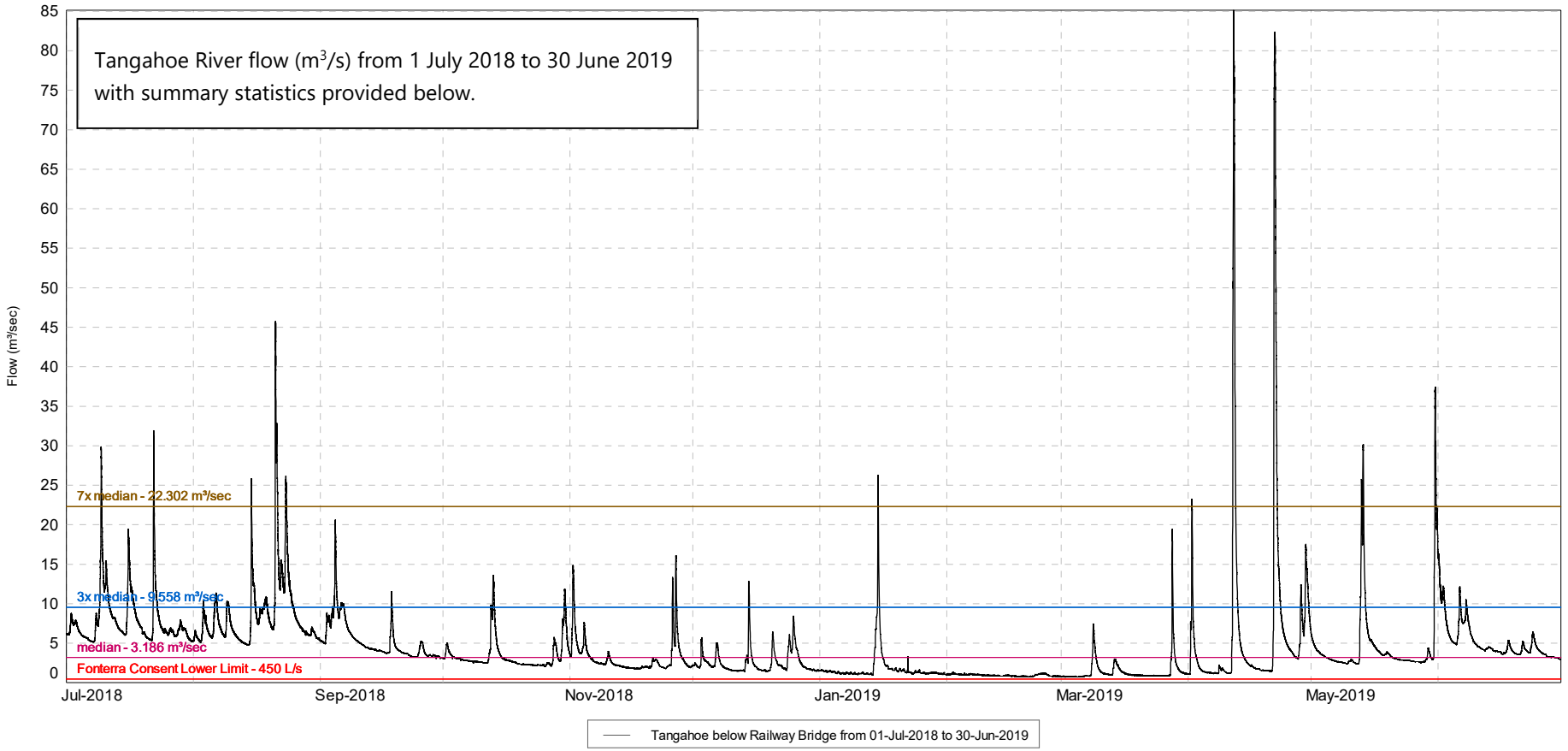
A D McLay
Director - Resource Management

Appendix II

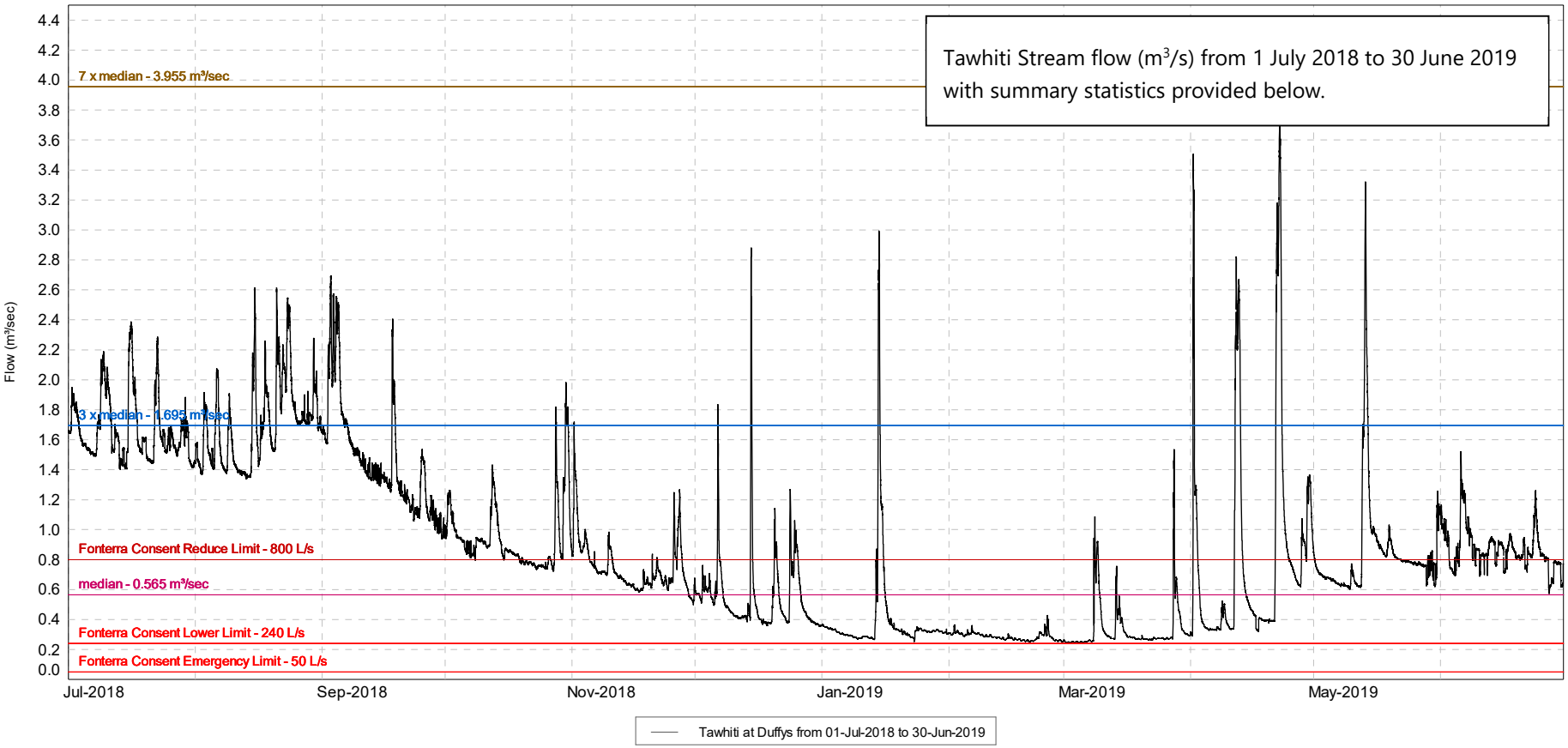
Fonterra Whareroa water abstraction: Hydrographs and summary statistics 2018-2019



Source is R:\UNAUDITED-DATA\TELEMETRY\TELEMETRY.HTS
Flow (m³/sec) at Tangahoe below Railway Bridge
From 1-Jul-2018 00:00:00 to 1-Jul-2019 00:00:00

Minimum is 0.669 at 1-Mar-2019 23:05:00
Maximum is 85.122 at 12-Apr-2019 02:45:00
Mean 4.348
Median 3.016
Std Deviation 5.235

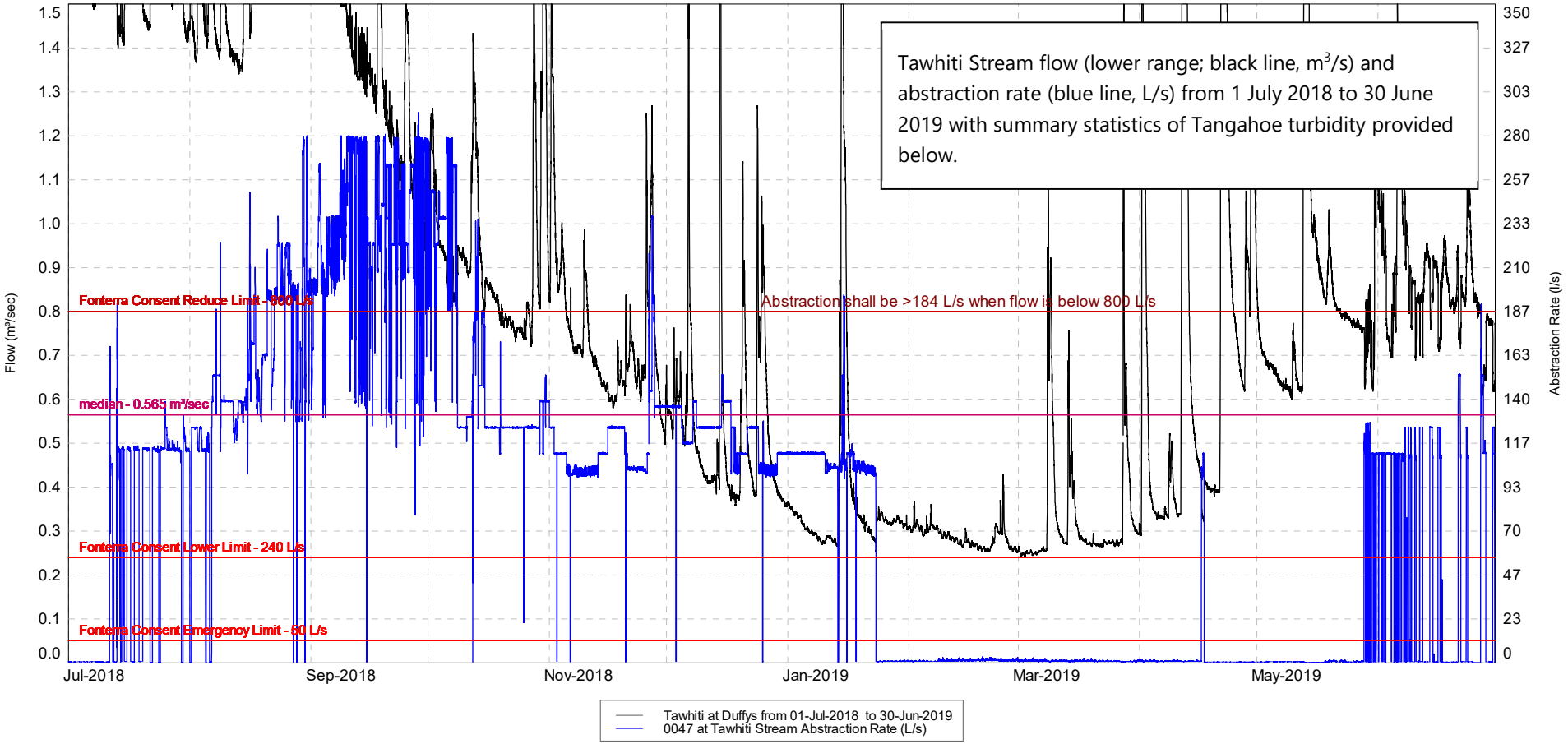
COV 1.204



Source is R:\UNAUDITED-DATA\TELEMETRY\TELEMETRY.HTS
Flow (m³/sec) at Tawhiti at Duffys
From 1-Jul-2018 00:00:00 to 1-Jul-2019 00:00:00

Minimum is 0.241 at 2-Mar-2019 14:05:00
Maximum is 3.820 at 22-Apr-2019 17:55:00
Mean 0.888
Median 0.773
Std Deviation 0.566

COV 0.638



Source is R:\UNAUDITED-DATA\TELEMETRY\TELEMETRY.HTS
From 1-Jul-2018 12:00:00 to 30-Jun-2019 12:00:00

Site Name	Measurement	Min	Max	Mean	Std Dev	L.Q.	Median	U.Q.	N	Total
4508 at Tangahoe River	Turbidity	0.000	638.859	27.712	41.554	9.616	19.071	29.932		