# Taranaki By-Products Ltd

## Monitoring Programme
## Annual Report
## 2023/24
## Technical Report 2024-49

Taranaki
Regional Council

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# Executive summary

Taranaki By-Products Ltd (the Company) operates an animal rendering plant located on Kohiti Road, Okaiawa in the Inaha Stream Catchment. Unusable material from animal processing plants in the North Island is received at the plant and processed into a range of protein products. Taranaki Bio-Extracts Ltd (TBE) is co-located at the site and manufactures edible food products from raw material (mainly bone) from the plant.

The Company holds 10 resource consents which include a total of 127 conditions setting out minimum requirements to avoid or minimise adverse effects on the environment. The suite of consents authorise the discharge of contaminants to land, water, and air from a range of activities on the site. Other consents authorise abstraction of groundwater and surface water.

This report for the period July 2023 to June 2024 summarises the monitoring programme implemented by Taranaki Regional Council (the Council) to assess the Company's environmental and consent compliance performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of the Company's activities.

**During the monitoring year the Company demonstrated a good level of environmental and administrative performance.**

The Council's monitoring programme included six inspections, 10 water quality surveys, and two biomonitoring surveys of receiving waters.

The compliance inspections and monitoring for this period concluded that the site was generally compliant with its resource consent conditions. Surface areas outside the building which drain to the stormwater network and Firewater Pond were kept cleaner than last year. Overall, the inspections found that odour was less intense and frequent around the plant, and one complaint was received from the public, nine fewer than the previous monitoring year.

Discharges of odour to air from the activities on-site continue to extend beyond the boundary of the site, and impact the community, as evidenced by comments during the community liaison meetings. However, attendees of the meetings noted that, overall, odour had improved compared to previous years, and only one complaint was received this year. Odour management must continue to be a high priority for the Company, and the current management measures should be followed and reviewed regularly to ensure odour discharges are minimised as far as practicable.

Water quality monitoring of Pond 6 identified ongoing exceedances of consent limit for dissolved oxygen. There do not appear to be any adverse effects as a result, however The Company continues to try to resolve this issue. Discharges of treated wastewater into the Inaha Stream contained high levels of total nitrogen and resulted in high levels of ammoniacal nitrogen immediately downstream, but the in-stream contaminant levels complied with the relevant consent limits including for unionised ammonia, biological oxygen demand and pH, and did not appear to have adverse effects beyond those provided for by the resource consents. Biological monitoring of the Inaha Stream and tributaries did not indicate any recent significant impacts from the Company operations. Most sampling locations received the same or improved health rating for the macroinvertebrate community compared to the previous year, with most rated as fair, good or very good. The biomonitoring report concluded that discharges to the Inaha Stream during the monitoring period were not likely to be having a significant adverse effect on the community of organisms.

Sampling of the groundwater wells in the irrigation areas indicated that irrigation of wastewater to paddocks is resulting in low level contamination, but that these have generally remained stable in the long term. While groundwater monitoring of the burial area reported high levels of contaminants, these were spatially and temporally variable, and there were no clear effects on water quality in the Inaha Stream based on monitoring results.

For reference, in the 2023/24 year, consent holders were found to achieve a high level of environmental performance and compliance for 864 (89%) of a total of 967 consents monitored through the Taranaki tailored monitoring programmes, while for another 75 (8%) of the consents a good level of environmental performance and compliance was achieved. A further 26 (3%) of consents monitored required improvement in their performance, while the remaining two (<1%) achieved a rating of poor.

This report includes recommendations that the 2024/25 monitoring programme continue at the same level as the 2023/24 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 2023 to June 2024 by Taranaki Regional Council (the Council) for the monitoring programme associated with resource consents held by Taranaki By-Products Ltd (the Company) and is the 30th annual report.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by the Company for a range of activities at the site including water abstraction, discharges of process and wastewater into the Inaha Catchment and to land, discharges of waste to land, and discharges to air.

### 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;
- a summary of the activities and operations conducted on the Company's site; and
- the resource consents held by the Company.

**Section 2** outlines the monitoring programme during the period under review.

**Section 3** details the results of the monitoring.

**Section 4** discusses the results of the monitoring and the effects on the environment.

**Section 5** presents recommendations to be implemented in the 2024/25 monitoring year.

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

### 1.1.3 The Resource Management Act 1991 and monitoring

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

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

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

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

### 1.1.4 Evaluation of environmental performance

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

For reference, in the 2023/24 year, consent holders were found to achieve a high level of environmental performance and compliance for 864 (89%) of a total of 967 consents monitored through the Taranaki tailored monitoring programmes, while for another 75 (8%) of the consents a good level of environmental performance and compliance was achieved. A further 26 (3%) of consents monitored required improvement in their performance, while the remaining two (<1%) achieved a rating of poor. [1]

## 1.2 Process description

The Company site is located on Kohiti Road, approximately 600m to the west of the Okaiawa township in South Taranaki. The Company operates a rendering plant with ancillary activities and owns a substantial amount of land surrounding the plant which is kept in pasture and used for irrigation of process wastewater and dairy effluent and provides an odour buffer to neighbouring properties. It lies within the Inaha Catchment. The Inaha stream passes through the wider site, and the rendering plant is adjacent to the true left bank. Two unnamed tributaries of the Inaha Stream traverse the western (the western tributary) and northern (the northern tributary) parts of the site. Activities on properties surrounding the site are primarily intensive pastoral farming, mainly dairy (Figure 2).

A full description of all processes which occur at the site and the treatment of waste can be found in the relevant consent application documents and previous annual reports. In brief:

- The business was established in 1936 and is the primary animal rendering plant in Taranaki, employing approximately 60 staff. The plant operates 24 hours/day, seven days/week throughout the year except for a shutdown period over Christmas.
- Raw material is sourced from abattoirs in the central and southern North Island. The raw material and products are transported to and from the site by trucking firm Bulk Lines Ltd.
- There are two processing lines; a mixed abattoir material line (processing beef and mutton, hard and soft offal) which has a maximum processing capacity of 18t/h, and the blood line which has a maximum processing capacity of 100,000L/day.
- Poultry material including; feather, blood meals, tallow and chicken oil, is no longer processed at the site.

[1] The Council has used these compliance grading criteria for more than 20 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

- Animal rendering is a two stage process, involving separation of fat and drying of the residual solids. The process is a continuous low temperature (less than 100˚C) dry rendering with mechanical de-watering by screw press, and some thermal de-watering. The dried product is milled, sieved and stored in bulk.
- The mechanical de-watering of the raw material creates large quantities of pressed-out animal product liquid called 'stickwater'. Waste heat exchangers dry the stickwater under vacuum to a stage where it can be incorporated back into the meal product. Washings and waste products from the stickwater system have been registered as a fertiliser (Zeal Grow) and are applied to an adjacent dairy farm owned by the Company. Recent developments within the facility have reduced the output of Zeal Grow.
- The TBE plant involves the processing of bone waste that has been separated from other raw offal at meat processing plants. The rendering and drying is carried out at lower temperatures than at the inedible products plant, resulting in less odour generation and heat emission.

### 1.2.1 Wastewater treatment system

Wastewater from the Company plant is generated by equipment and floor washings, condensates from treatment of gas emissions, and blood decanter liquids. In summary:

- All wastewater from the plant is pumped through the rotary screen, then a 100$m^3$/h Dissolved Air Flotation (DAF) unit to which flocculent is added to assist in recovery of solids.
- The wastewater then moves sequentially through Ponds 1 to 3 where anaerobic microorganisms break down organic molecules. The condensate wastewater from the plant is pumped directly to Pond 1. Ponds 1 and 2 may be operated in parallel, depending on loadings.
- Wastewater from Pond 3 discharges to an aerated lagoon (Pond 4). The aerators assist in the reduction of biochemical oxygen demand (BOD) and of ammonia concentration.
- The wastewater passes through a small settling Pond (Pond 5) and then into Pond 6 which is the final treatment stage. The treated water is either used in the odour control system, preferentially irrigated to land, or discharged into the Inaha Stream when conditions allow.

### 1.2.2 Odour management

The rendering operations have potential to generate offensive odour from sources including the storage of raw materials, the rendering processes, wastewater treatment and disposal systems, fugitive odour from the processing building, biofilters and solid waste burial areas. Odour control measures used by the Company include:

- Ensuring the quality of product received at the site.
- Maintaining negative pressure in the processing building to avoid odour 'leaking' from the building.
- Diverting odorous air through biofilter beds which remove odour compounds from the air stream.
- Management of the wastewater treatment system.
- Minimising exposure of carcasses in the burial pit by covering them as soon as practicable.
- Applying lime to the burial pits to minimise growth of odour-causing microorganisms.
- The air discharge consent requires the Company to engage an air quality specialist to certify that the works, processes, and equipment meet "good engineering practice". The most recent audit report from Golder and Associates (Golder and Associates, 2021) was published in August 2023 and submitted to Council on 30 January 2024. The next audit report must be submitted by 30 April 2025.

## 1.3 Resource consents

Taranaki By-Products Ltd holds 10 resource consents, the details of which are summarised in the table below.

Six of the site's resource consents expired in 2019 but applications to replace these were lodged in November 2018, more than six months before the expiry date. In accordance with section 124 of the RMA the site may continue to operate under the existing consents until a decision is made by Council on these applications. Activities and discharges continue to be monitored in accordance with the existing consent conditions.

Table 1 Summary of resource consents held by the Company

| Consent number | Purpose | Granted | Next review date | Expiry date |
|---|---|---|---|---|
| *Water discharge permit* | | | | |
| **2049-4** | Discharge treated wastewater to Inaha Stream | October 2006 | - | 2019* |
| **5426-1** | Discharge stormwater to Inaha tributary | May 1999 | - | 2019* |
| **2050-4** | Discharge cooling/backwash water to Inaha Stream | May 1999 | - | 2019* |
| *Water take permit* | | | | |
| **2051-4.1** | Take from Inaha Stream | January 2015 | - | 2019* |
| **9756-1** | Take groundwater | February 2014 | - | 2029 |
| *Discharge to land permit* | | | | |
| **3941-2** | Discharge treated wastewater to land | November 2009 | - | 2019* |
| **5495-1** | Discharge meat wastes by burial into land | August 2000 | - | 2019* |
| *Air discharge permit* | | | | |
| **4058-4** | Discharge emissions to air from rendering operations | October 2011 | - | 2024* |
| **10054-1** | Discharge emissions to air from burning | January 2015 | - | 2029 |
| *Land use permits* | | | | |
| **6431-1** | Place culverts in Inaha Stream | October 2004 | - | 2023** |

* An application for a replacement consent has been received and is currently on hold. Operating under s124 of Resource Management Act 191

** An application for a replacement consent has been received and is currently on hold.

## 1.4 Monitoring programme

### 1.4.1 Introduction

Section 35 of the RMA sets obligations on 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 on 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 Company consisted of six 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 site was inspected on six occasions 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. This included 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 the Company were provided so that performance in respect of operation, internal monitoring, and supervision could be reviewed by the Council.

### 1.4.4 Water sampling

Water samples are collected from surface water and groundwater to monitor the concentrations of a suite of contaminants discharged as a result of discharges of treated wastewater to the Inaha Stream and to land by irrigation and injection. The results of the monitoring can be found in section 2.

Surface water sampling of the locations in the Inaha Stream (Figure 1) while Pond 6 is discharging to the Inaha Stream helps to assess the likely effects of the discharges on water quality parameters. When there is no direct discharge the surface water sampling from locations in the Inaha Stream and tributaries helps to assess the likely effects from irrigation to the pasture (Figure 1). During irrigation surface water contamination may occur through surface runoff and/or subsurface diffuse discharges (groundwater recharge or subsurface drainage) to these watercourses. The samples are sent for laboratory analysis of the analytes listed in Table 4.

Table 2 Inaha Stream and tributaries sampling sites (Figure 1)

| Description | Site code |
|---|---|
| Ahipaipa Road | INH000334 |
| Bridge 420m upstream of Kohiti Road | INH000348 |
| Northern Tributary at Inaha confluence | INH000397 |
| Kohiti Road bridge | INH000400 |
| 60m downstream of Firewater Pond and Pond 6 discharges | INH000408 |
| 500m downstream of Firewater Pond and Pond 6 discharge | INH000420 |
| Normanby Road bridge, 1,450m downstream of discharges | INH000430 |
| Western tributary, 3,500m upstream of Inaha confluence | INH000433 |
| Western tributary 2,550m upstream of Inaha confluence | INH000435 |
| Western tributary 250m upstream of Inaha confluence | INH000440 |
| Inaha Stream, 100m downstream of 'irrigation' tributary | INH000450 |
| Inaha Stream, State Highway 45 | INH000470 |

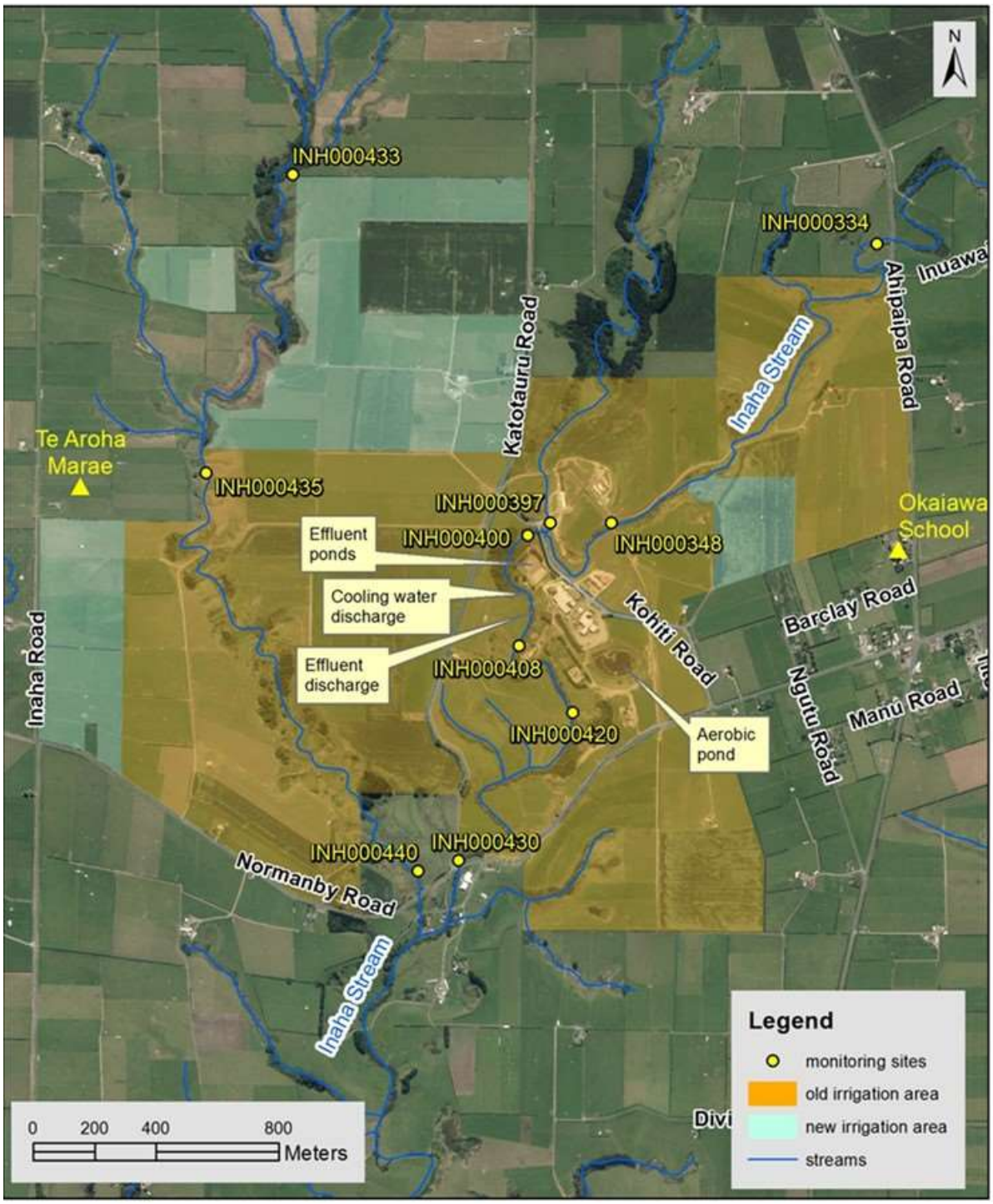


Figure 1 Wastewater irrigation areas, surface water monitoring and point source discharge locations in the Inaha Stream and tributaries

Stormwater generated in the main yard, garage and raw material reception areas is diverted to a three-stage stormwater treatment system (near B, Figure 1). The first flush of a rainfall event is discharged to Pond 1 and after that is discharged via an outlet pipe (E) into the Firewater Pond which itself discharges into the Inaha Stream. The stormwater discharge only occurs under high rainfall conditions and, unless sampling coincides with such an event, samples are collected from the stormwater treatment system rather than the discharge pipe. Consequently, the sample results may not represent the quality of the direct discharge into the Firewater Pond.

Other point source discharges which are subject to routine water quality analysis are the Pond 6 discharge (A) cooling water discharge pipe (B) and discharge from the Firewater Pond (C).

Table 3 Taranaki By-Products point source surface water monitoring sites (Figure 1)

| Site | Description | Site code |
|---|---|---|
| A | Aerobic Pond effluent | IND004004 |
| B | Cooling water discharge | IND002004 |
| C | Stormwater, firewater, coolant and groundwater seepage from reservoir | IND001014 |
| D | Stormwater, firewater, coolant and groundwater seepage to Inaha | IND001015 |
| E | No 1 stormwater: main reception, garage and yard to firewater reservoir | STW001075 |


Figure 2 Location of the Company site at Kohiti Rd, Okaiawa

The Council collects samples from groundwater monitoring bores (Figure 3) to assess the likely effects of the wastewater irrigation and diffuse discharges from the burial pits on the groundwater across these areas. A list of groundwater analytes can be found in Table 4.

In addition, three temperature recorders (one installed in the cooling water tributary and the others upstream and downstream of the confluence of the Inaha Stream and its tributary) were run continuously and downloaded periodically.

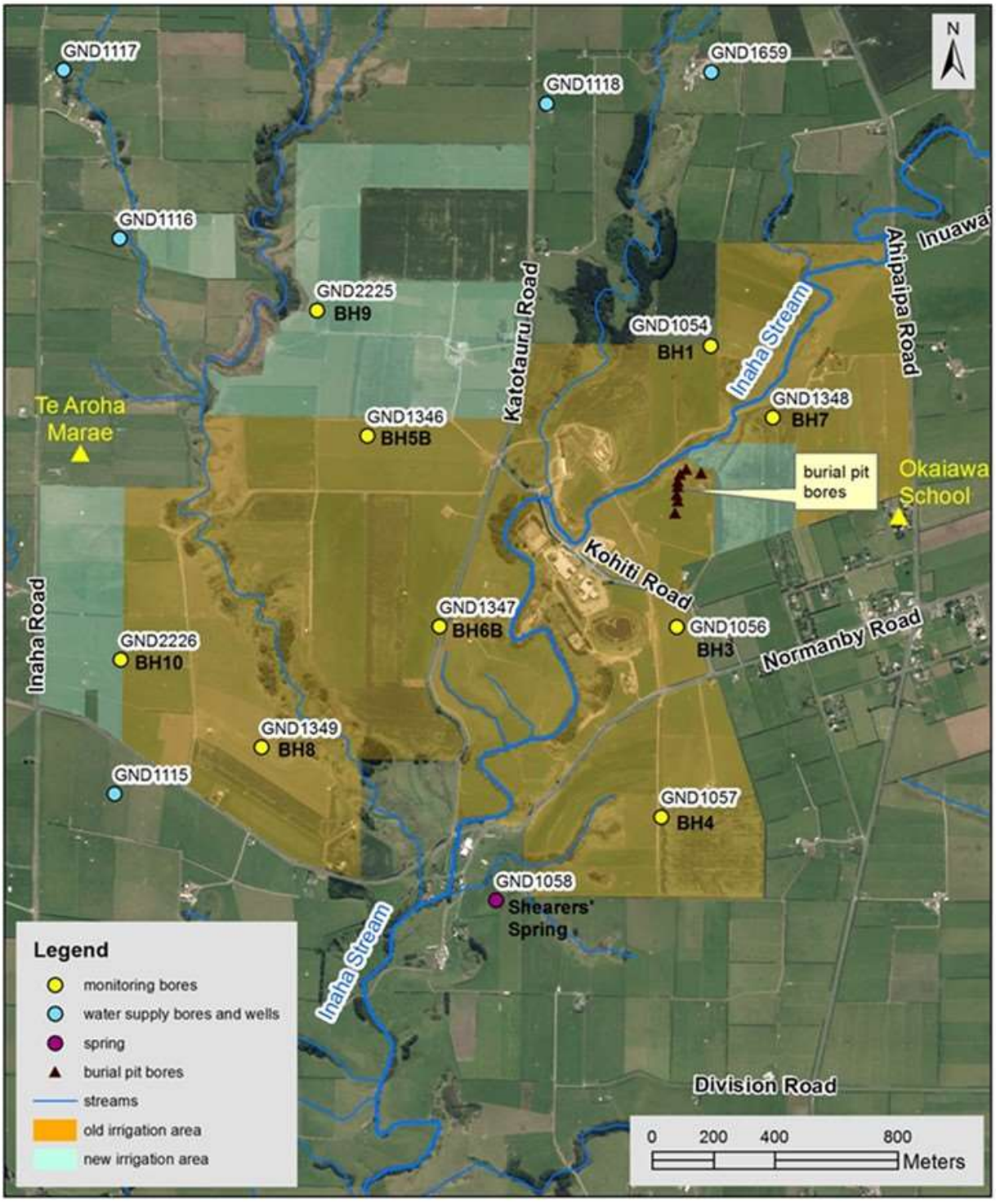


Figure 3 Locations of the groundwater monitoring wells

Table 4 Monitoring analytes by medium (SW=storm water, GW=groundwater, DS=discharge)

| Parameter | Description | Units | Medium |
|---|---|---|---|
| BOD | Biochemical oxygen demand 5day | $g/m^3$ | SW/DS |
| Cl | Chloride | $g/m^3$ | DS |
| CONDY | Conductivity @ 25°C | mS/m@25°C | SW/GW*/DS |
| DO | Dissolved oxygen | $g/m^3$ | SW/DS |
| DRP | Dissolved reactive phosphorous | $g/m^3$ | |
| *E. coli* | Escherichia. coli | MPN/100mL or cfu/100mL | DS |
| $NH_3$ | Un-ionised ammonia | $g/m^3$ | SW |
| $NH_4$ | Ammoniacal nitrogen | $g/m^3$ N | SW/GW* |
| NNN | Nitrite+nitrate+nitrogen | $g/m^3$ N | SW/GW* |
| $NO_2$-N | Nitrite nitrogen | $g/m^3$ N | DS |
| $NO_3$-N | Nitrate nitrogen | $g/m^3$ N | DS |
| PERSAT | Dissolved oxygen saturation % | % | SW/DS |
| pH | pH | pH | SW/GW*/DS |
| Temp | Temperature | °C | SW/GW*/DS |
| TURBY | Turbidity | NTU | SW/DS |
| BODCF | Biochemical Oxygen Demand | $g/m^3$ | SW/DS |
| FLOW | Flow | $m^3/s$ | DS |
| Level | Water level | m | GW* |
| ALKT | Alkalinity total | $g/m^3$ $CaCO_3$ | GW/DS |
| Ca | Calcium | $g/m^3$ | GW/DS |
| COD | Chemical oxygen demand | $g/m^3$ | GW*/DS |
| K | Potassium | $g/m^3$ | GW/DS |
| Na | Sodium | $g/m^3$ | GW/DS |
| SAR | Sodium adsorption ratio | None | DS |
| TSS | Total suspended solids | $g/m^3$ | DS |
| ST | Sulphide total | $g/m^3$ | DS |
| TN | Total nitrogen | $g/m^3$ N | DS |
| TP | Total phosphorus | $g/m^3$ P | DS |
| O&G | Oil and grease | $g/m^3$ | DS |

### 1.4.5 Biomonitoring surveys

Two seasonal biological monitoring (biomonitoring) surveys were performed at eight sites; five in the Inaha Stream and three in the tributaries (Figure 4). Surveys were undertaken during early summer (December) and early Autumn (March). These surveys used standardised sampling methods to collect stream macroinvertebrates in order to assess and monitor the condition of macroinvertebrate community. A detailed description of the sampling methodology can be found in the biomonitoring reports (Taranaki Regional Council, 2023). A summary of the results can be found in section 2.4.6 and a discussion about the likely effects can be found in section 3.1.

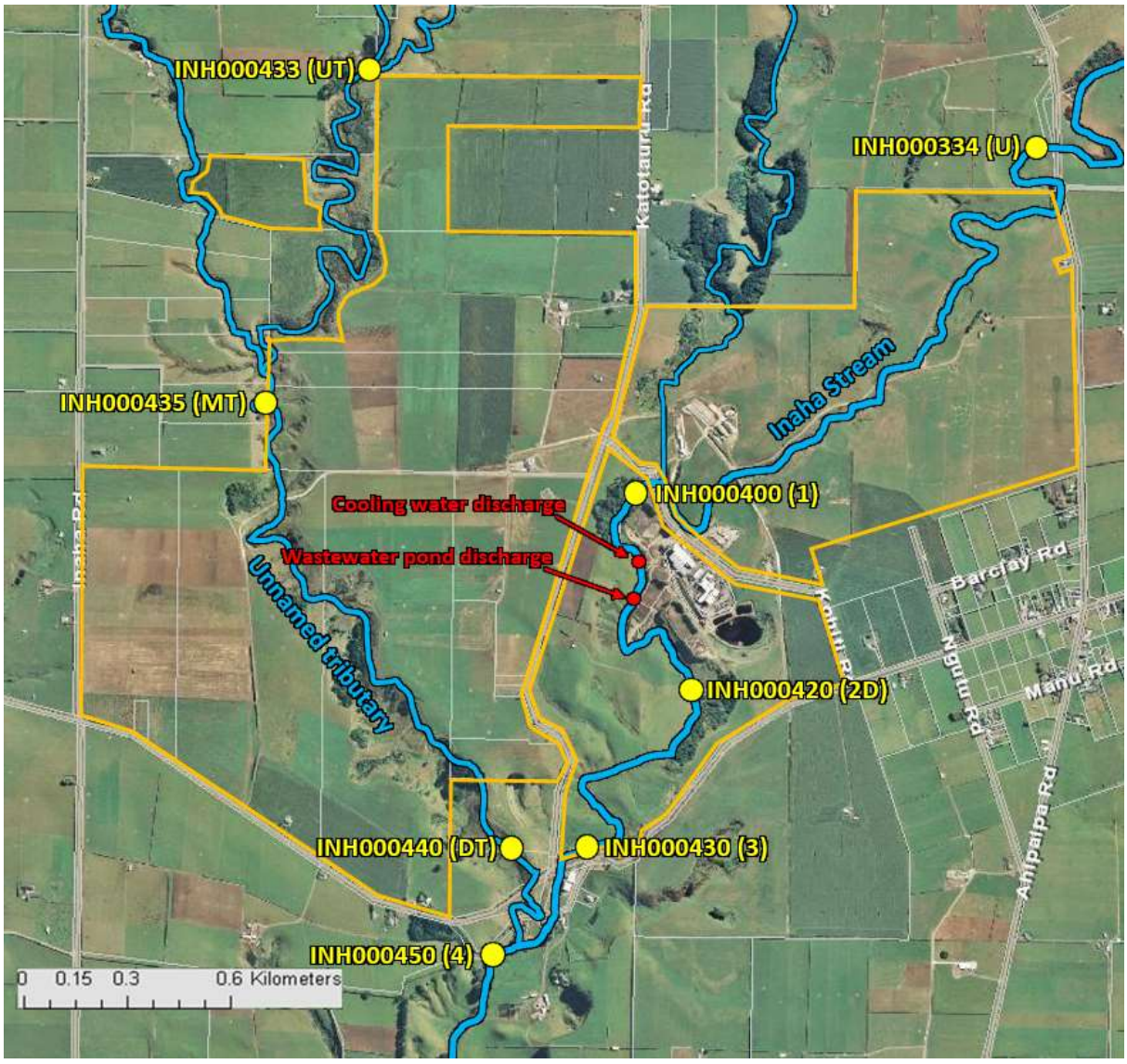


Figure 4 Location of biomonitoring sites and discharge points in the Inaha Stream and tributary with the site boundaries in orange

### 1.4.6 Monitoring by Taranaki By-Products

The Company monitor a range of processes on site and report the results to Council on a monthly basis. The monthly reports contain information about discharges into the stream, including location, duration, stream flow, nitrogen content, method of application and loading information. These reports provide information detailed in the irrigation management plan as required by Consent 3941-1 Condition 3.

### 1.4.7 Air discharges monitoring programme

The air quality monitoring programme for the Company site consisted of the following components:

- Liaison with the Company staff;
- Site inspections to monitor the odour control systems and odour minimisation procedures, and to assess odour levels on site and beyond the boundary;
- Internal monitoring by the Company including odour surveys, recording production rates and weather data, investigating odour complaints, and maintenance work; and
- Community liaison meetings to discuss odour issues.

# 2. Results

## 2.1 Inspections

During this monitoring period there were seven scheduled inspections which assessed the site's compliance with the suite of conditions in all consents. During inspections particular attention was given to the following aspects:

- rendering processes;
- air emission control systems;
- load-in and load-out areas;
- chemical and oil/fuel storage areas;
- stormwater system;
- wastewater treatment system;
- land irrigation system; and
- waste burial areas.

**3 July 2023**

The inspecting officer noted that the outside storage, unloading and product-reception areas were tidy, the Company's environment manager explained that recent training had been provided to staff following poor practices. The area outside Cow Room and Raw Floor was clean and tidy, and enclosure of this area was close to being completed. The area from the DAF unit to wastewater sump was in the process of being cleaned and appeared tidy. A contractor was onsite with tractor and slurry wagon which was to be cleaned following the application of stickwater to pasture by injection. Ponds 1, 2 and 4 had a good cover of crust. The burn pile contained prohibited items including treated timber from scaffolding and fibre glass based product. The environment manger said this would be removed. Pond 6 was less turbid than past visits and the environment manager advised that pond 6 would soon be discharged to the Inaha Stream as the paddocks were becoming saturated, and that the Council and iwi would be informed beforehand.

Rubbish was noted around the Bulk Lines truck yard which had the potential to block drains and sediment traps. The inspecting officer advised that a monitoring and cleaning program should be implemented. Cardboard and bags were seen in the sediment traps by the fire pond. The new pipeline to the bio-filters was still inoperable since it had been disabled by a truck incident. The old extraction system was being used to bypass process air to the biofilters, repairs were expected to be complete soon.

Progress was being made toward meeting the requirements of Abatement Notice EAC-23312 which required the mapping of the underground vectors of discharges. The mapping has been outsourced out to McKinlay Surveyors, Alan Doy.

**17 August 2023**

The outside areas between the Cow Room and the driers were clean and tidy. Ponds 1 and 2 were nearly at capacity with effluent. There was no burn pile at the time, although prohibited items were being stored next to it. The surface of Pond 3 was one quarter covered with vegetation and the rest with crust. Pond 4 was being aerated at the time and the DO reading was 0.43g/$m^3$.

On 15 August 2023 the Company notified the Council that a pipe from Pond 6 to the factory scrubbers had ruptured leading to a discharge into the firewater pond, and then into the Inaha Stream. The rupture had been repaired by the time of the inspection.

Pond 6 was being aerated by one of the two brush aerators, and discharge to Inaha Stream was occurring.

Process air from the factory was still being diverted through the old system because the new ducting was still being repaired. Progress on mapping of discharge vectors was still ongoing. Construction of the car park was close to completion.

The odour around the site was described as minimal. The site was deemed fully compliant at time of inspection.

**27 October 2023**

Odour was detected en route to the Company at the end of Barclay Rd which is east of the Company's site. There was minor tracking of material from vehicles using the ramp from the Raw Floor area entrance. Some spillage was sighted around the sumps near the driers, and this was attributed to a leak from a slurry tanker hose when it was filling the tanker. It was being cleaned up at the time. The burn pile contained pallets.

Farm dairy effluent was being discharged into ponds 1 and 2 at the time of the inspections, and each pond had a crust on the surface. Pond 3 was forming a crust over the surface, with about one third of the cover being vegetation. Pond 4 was being aerated and the DO reading was 0.77g/$m^3$. Pond 6 was no longer discharging to the Inaha Stream, and all four aerators were operating with the intention of increasing DO above 1.0 as per the consent condition. The site environment manager took a DO reading from Pond 6 which returned a result of 0.77g/$m^3$. The return flow was being divided between Ponds 6 and 4 to try and help DO level in Pond 6.

The TBE Duskie biofilter bed had been replenished with bark to cover a degraded layer. The ducting for the Company factory air 1 was expected to be complete by Christmas.

Residual waste was being stored in former dairy factory on Normanby Road. The area outside was clean and tidy.

As the officer left the site the wind changed to a westerly. Odour that had been occurring at end of Barclay Rd was gone. On leaving the site the inspecting officer revisited Barclay Road, and the Okaiawa township on general and reported that the odour has dissipated.

The site was deemed to be fully complying with most consent conditions, except for the DO level in Pond 6 which is subject to Abatement Notice ENF-24125.

Following the inspection the Company advised that TBE (process air) concentrate sources duct was repaired and operational. The TBE concentrated sources and the Duskie drier Bio filter beds were separated and restored to normal flows. The Duskie drier bio filter bed had also been rebuilt with new stone, lateral pipe work and bark.

**13 December 2023**

Odour was once again noted near Barclay Rd prior to arrival on site, but it was not considered offensive or objectionable. The source of the odour was the Company meal room where the door was open to allow for maintenance to be carried out. The areas immediately outside the Raw Floor, the DAF, and the sumps were clean and tidy.

There was no noticeable odour around ponds 1 and 2 and both had a well-formed crust on the surface. In order to raise the DO level of Pond 6 the effluent input had been divided between it and Pond 3. As a result of the increased input to Pond 3 the surface had become exposed and to remedy this straw had been spread on the surface to encourage crusting. Ponds 4 and 6 were being aerated at time and the DO concentration in Pond 4 was 2.05. Screens had been added to the inlets of ponds 5 and 6 to prevent debris entering the treatment system or clogging pipes. The Company's environmental manager reported that DO readings in Pond 6 continue to be variable, and the Company continues to implement measures to increase the DO.

Work to expand and upgrade the Company Bio filters is continuing, and the Company expected that all bio filters would be fully functional within a few weeks of the inspection.

The car park construction was complete, and work was underway at the site entrance which included installing a pipe beneath the road. The pipes would connect to water storage tanks which, once installed, would collect roof water. The water would be used to suppress dust on site and supply the fire suppression system.

The replacement culvert installed in 2022 was inspected. The spillway had been added but direction of flow from outlet side may need addressing as flow is directed away from stream.

**11 January 2024**

The upgrades at the site entrance have improved the safety for vehicles entering and exiting the site. The outside area of Raw Floor/Cow Room was clean and tidy with minimal tracking of material around the access. All other outside areas prone to spillage or contamination were clean and tidy. The inspection of the meal room, secondary area and blood room found them to be compliant.

Ponds 1 and 2 have well-formed crusts, and effluent was entering the ponds at the time. Pond 3 still has mulch on exposed areas and the proportion of vegetation on the surface had increased from one third to one half of the surface area. A temporary generator was operating the aerators due to a transformer malfunction earlier in the morning. DO reading in Pond 4 was 1.28. The water level in ponds 5 and 5a were lower compared to the previous inspection. The Pond 6 aerators were operating and the officer observed that irrigators were operating at the time of inspection. There was no apparent odour from the ponds or the irrigators.

The Bio filter beds were operational, although there was maintenance to be done on bed FA1. The burn pile contained no prohibited items and surrounding area was tidy. The sump/sand trap at the rear of TBE which treated stormwater entering the firewater pond was clean and tidy, and there was minimal rubbish in the surrounding area compared to previous inspections.

The area outside the former Normanby dairy factory was tidy, and the shed was not being used for storage at the time. Overall, the site was complying with the consent conditions.

**14 March 2024**

At the time of the inspection staff from WSP consultancy were conducting off site odour surveys for the resource consents applications. The officer did not observe any odour during the drive to the site.

The Raw Floor area was clean and tidy, and the sand trap next to waste sump at back of the Company was clean. An overflow had occurred from tallow tank and had infiltrated the foundation work for shell and tube condenser for the waste heat evaporators. Remedial work was underway to pump tallow waste from affected area. The spill was adequately contained and there was no visible leaching of contaminants through the exposed foundation work.

Ponds 1 and 2 had well-formed crusts over the surface, and there was a light to moderate odour in the vicinity. A pile of sand trap waste was next to pond 2 and the environmental manager explained it was due to be transported off site. Pond 3 had vegetation beginning to establish on previously exposed areas that had been covered with straw. Approximately half the crust was well vegetated, and the remaining area showed signs of germinating vegetation. Pond 4 was being aerated and the DO reading was 2.94g/$m^3$. The Company had recently purchased a product called Micromix Aqua to add to Pond 4 in the hope it would help raise the DO level in Pond 6.

The Bio filters were working well and an even amount of condensation was visible over the beds. The burn pile did not contain any prohibited items. The Firewater pond was clear with light cover of seasonal aquatic

vegetation on the surface. The officer noted rubbish in the ring drain behind TBE and the PVC pipe blocked at one end, the pipe discharges into the firewater pond. There was still some flow but the environment manager was advised to clean it out.

Maintenance of the hot water tanks at rear of TBE has created a pile of sediment in the gutter leading to grated drain which diverts stormwater to the settlement sump behind the Company. Consequently, the stormwater was flowing across the sealed surface to another drain which discharges into the firewater pond sand trap. The environment manager was advised that this area also needed cleaning.

The site was deemed to be compliant with resource consent conditions at the time.

**28 May 2024**

The inspecting officer noted a distinct odour in the Okaiawa township prior to the inspection and reported this to the Plant Manager who said he would check site data. The officer met with the Company environmental manager, and they went to a location downwind of the site. The odour was still apparent there, but was weaker than earlier, and there was no odour in Okaiawa.

On returning to the site the officer observed odour with the same character coming from an open door in the TBE plant. The Plant Manager immediately investigated the cause of the odour and said he would respond with the outcomes of his investigation.

The areas outside the Raw Floor and at the back of the driers were clean and tidy. The Shell and Tube Condenser is still to be installed. When installed this will condense gases from the evaporators which will reduce the temperature of gas from the driers from 86°C to around 50°C, this in turn will improve the effectiveness of the biofilter.

Ponds 1 and 2 had well-formed crusts on the surface, and there was minimal odour coming from either pond. The burn pile did not contain any prohibited items. Half the surface of Pond 3 was covered in a crust and the remainder was vegetated. Pond 4 was being aerated, and the DO reading was 4.88g/$m^3$. The environment manager explained that the Company planned to add either a cooling tower or DAF plant to pond 4 to help with controlling the conditions in Pond 6. The DO in Pond 6 was 0.80g/$m^3$ at the time, which is lower than a reading during the previous week of 1.3g/$m^3$. The stormwater ring drain by Bulk Lines truck depot was scheduled to be cleaned. The environment manager explained that during the cleaning the pipe leading to the Firewater Pond would be blocked to prevent unintended discharges, and a sucker pump would be used to remove sediment laden water which would then be spread to pasture.

The site was considered to be compliant with conditions of consent at the time.

## 2.2 Abstraction monitoring

### 2.2.1 Surface water abstraction – Inaha Stream

The abstraction of water from the Inaha Stream was undertaken in accordance with the conditions of Consent 2051-4. This authorises a maximum daily abstraction rate of 2,160$m^3$/day or 25L/s on average, and an instantaneous maximum of 50L/s. As presented in Figure 5 the daily abstraction volume from Inaha Stream complied with the limit throughout the monitoring period. The highest rate of take was during July and generally reduced through the monitoring year.

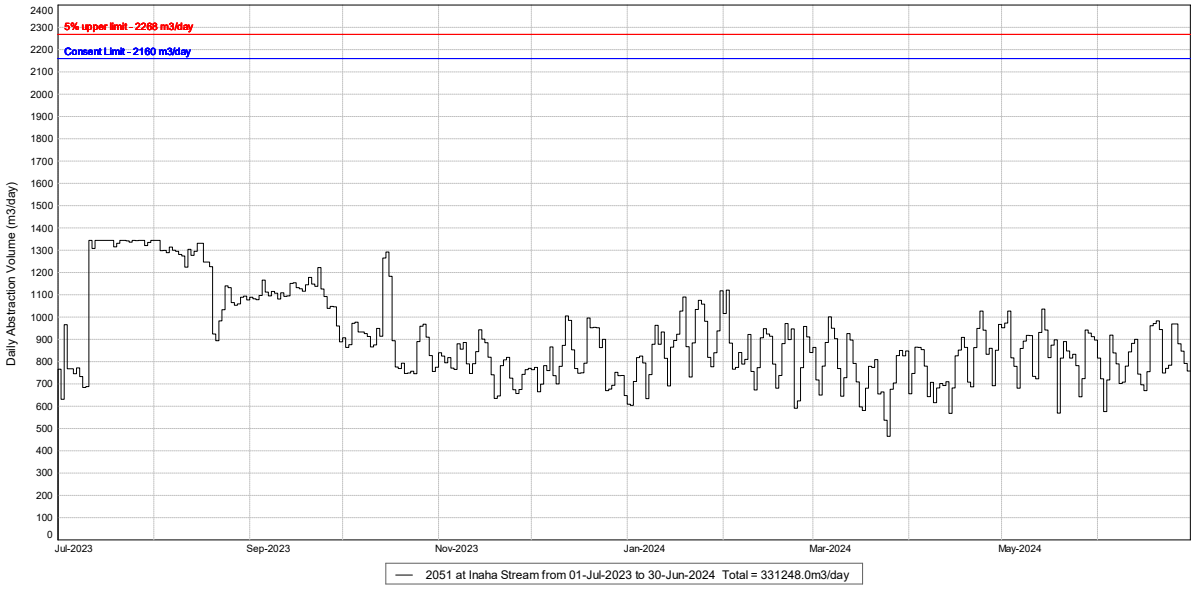


Figure 5 Daily abstraction volume from the Inaha Stream

As shown in Figure 6 the average and instantaneous limits were also complied with. The abstraction rate during the 2023/24 monitoring year remained significantly lower than the consent limit of 50L/s, and also well below the long-term average water take rate since March 2013.

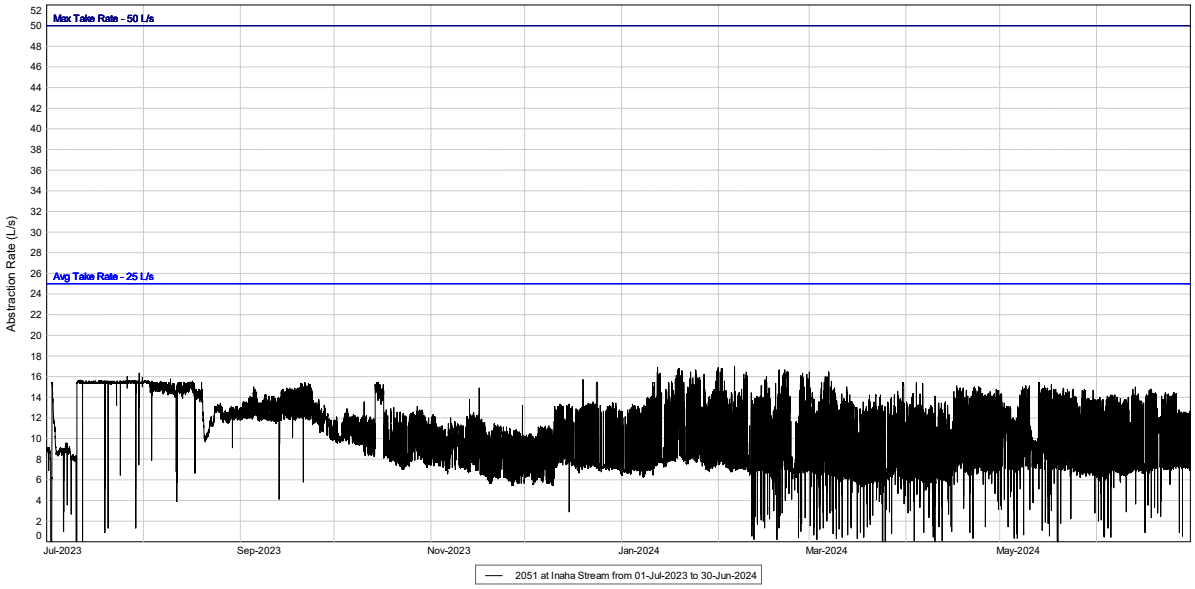


Figure 6 Rate of abstraction from the Inaha Stream

## 2.2.2 Groundwater abstraction

Consent 9756-1 authorises groundwater abstraction at a rate not exceeding 22.8L/s (1,970m$^3$/day).

Figures 7 and 8 display the data telemetered to Council's database to enable monitoring of compliance with the consent limit. The rate of water abstracted from the groundwater bore complied with consent condition limit at all times throughout the 2023/24 monitoring period.

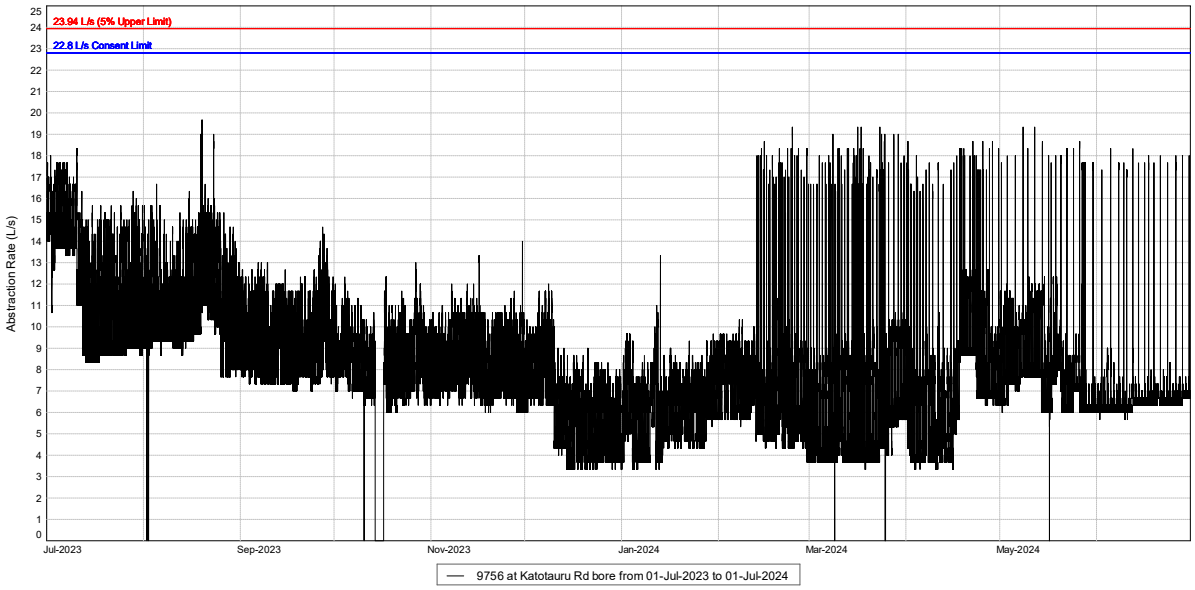


Figure 7 Groundwater abstraction rate 2023/24

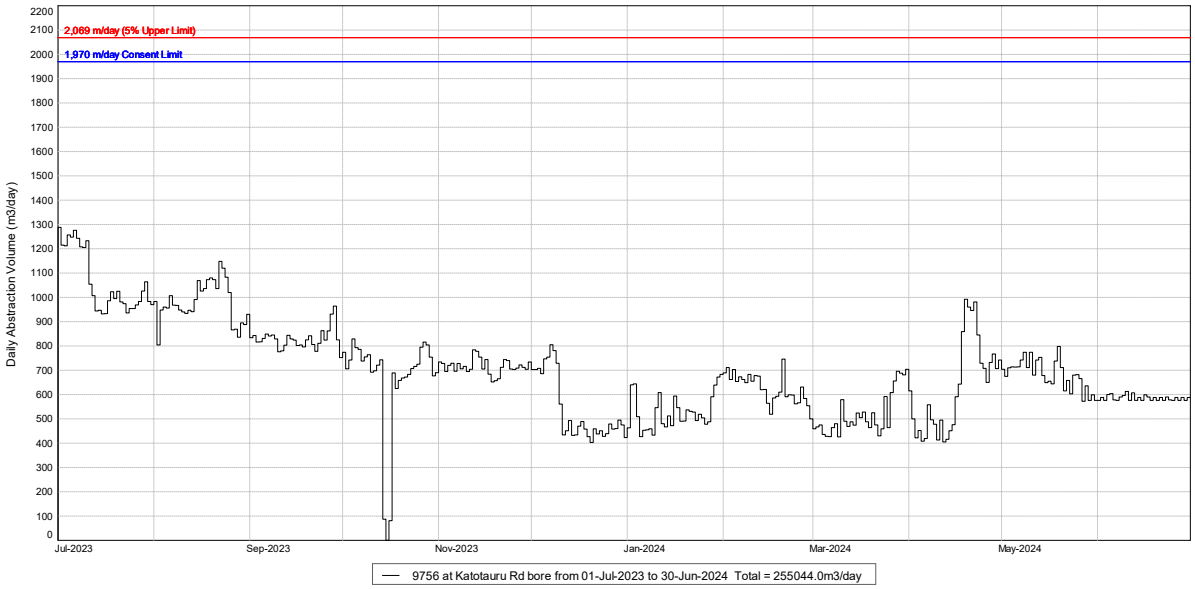


Figure 8 Groundwater daily abstraction volume for 2023/24

## 2.3 Wastewater monitoring

### 2.3.1 Pond six sampling

Five samples were collected from the final wastewater treatment Pond (Pond 6, IND004004) during the 2023/24 monitoring period to assess compliance with the discharge limits in Consents 2049-4 and 3941-2.

Consent 3941-2 permits the discharge of treated wastewater from Pond 6 to land by spray irrigation, and imposes the following limits on treated wastewater in Pond 6:

- Dissolved oxygen (DO) shall be maintained above 1.0g/m$^3$.
- Sodium absorption ratio shall not exceed 15.

The results are presented in Table 5 and show that the sodium absorption ratio ranged between 9 and 11 which are less than the consent limit of 15. Long-term application of sodium to land can displace calcium

and magnesium in soil, and cause a loss of structure. The DO results ranged from 0.2 to 0.8g/m$^3$ and increased over time but failed to comply with the consent limit of 1.0g/m$^3$. An abatement notice had been issued in September 2023 for failure to comply with the DO limit and improvement works continue. The Company has implemented testing to monitor DO levels to assist in managing conditions in the pond. Low DO in ponds can lead to the growth of anaerobic microorganisms and production of hydrogen sulphide gas which causes a rotten egg odour. This can cause significant odour effects if the wastewater is irrigated to land close to sensitive receptors. There were no complaints received this monitoring year about odour from the wastewater irrigation.

There is no limit on the concentration of total nitrogen in Pond 6 however the samples have been analysed for total nitrogen since 2011 and this year's results are presented in Table 5.

Table 5 Results of Pond 6 sampling (exceedances in **bold**)

| Date | Sodium absorption ratio | Dissolved oxygen (g/m$^3$) | Total nitrogen (g/m$^3$) |
|---|---|---|---|
| 15 August 2023 | 9 | **0.21** | 193 |
| 12 October 2023 | 10 | **0.34** | 230 |
| 16 November 2023 | 10 | **0.6** | 165 |
| 26 January 2024 | 9 | **0.42** | 186 |
| 28 May 2024 | 11 | **0.82** | 210 |
| *Consent limit* | *15* | *> 1.0* | - |

## 2.3.2 Cooling water analysis IND002004

The cooling water discharges (IND002004) into the Firewater Pond was sampled on four occasions during the monitoring period to assess compliance with Consent 2050-4.

Table 6 Results of cooling water sampling at IND002004

| Date | Temp (°C) | Electrical Conductivity (mS/m) | pH | Total Ammoniacal-N (g/m$^3$) | Total Biochemical Oxygen Demand (g $O_2$/m$^3$) | Turbidity (NTU) |
|---|---|---|---|---|---|---|
| 185Aug 2023 | 12.6 | 26 | 7.5 | 0.42 | 1.2 | 9.9 |
| 16 Nov 2023 | 20.3 | 26.4 | 7.9 | 0.031 | 0.8 | 4.6 |
| 26 Jan 2024 | 23.5 | 25.9 | 7.8 | 0.094 | < 0.4 | 1.06 |
| 28 May 2024 | 15.4 | 33.5 | 7.4 | 1.79 | 3 | 11.6 |
| *Consent limit* | *35°C* | | | | | |

The temperature of the cooling water prior to entering the Firewater Pond ranged between 12.6 and 23.5°C when sampled and complied with the consent limit of 35°C. Samples were not analysed for total suspended solids (TSS), however the cooling water remains separate from process water and therefore is not likely to contain any sediment not already present in the surface water abstracted from Inaha Stream.

## 2.3.3 Stormwater analysis STW001075

The discharge of contaminated stormwater into the Firewater Pond is authorised by Consent 5426-1 which imposes the following limits on the stormwater quality:

- pH between 6 and 9.
- TSS concentration less than 100g/m$^3$.
- Oil and grease concentration less than 15g/m$^3$.

As detailed in section 1.4.4 when there is no discharge from the outlet, the samples are collected from the final tank in the treatment device. There was no discharge into the Firewater Pond occurring during any of the four sample surveys and so the results in Table 7 represent the quality of stormwater in the treatment device rather than the discharge into the pond.

Laboratory analysis for oil and grease concentration in the stormwater has not been undertaken since 2018. During the three years prior to 2018 the maximum result was 10g/m³ and the median result was 0.65g/m³. On this basis laboratory analysis for oil and grease is not necessary unless there is visual evidence of it during the sampling run. Samples taken from the Firewater Pond are, however, analysed for oil and grease and the results this year were less than 15g/m³ (Table 8). The results of the stormwater sample analyses are presented in Table 7 below.

Table 7 Stormwater discharge STW001075

| Date | Temp (°C) | Electrical Conductivity (mS/m) | *E. coli* (MPN/100 mL) | pH | Total Ammoniacal-N (g/m³) | Total Biochemical Oxygen Demand (g $O_2$/m³) | Suspended Solids (g/m³) | Turbidity (FNU) |
|---|---|---|---|---|---|---|---|---|
| 15Aug 2023 | 11.1 | 32.7 | >2,420 | 7.2 | 1.44 | 4.4 | 320 | 310 |
| 16 Nov 2023 | 16.9 | 817 | >2,420 | 7 | 5.9 | 5 | 34 | 13 |
| 26 Jan 2024 | 19.4 | 350 | >2,420 | 7.1 | 8.6 | 11.7 | 80 | 17.2 |
| 28 May 2024 | 13.7 | 40.1 | >2,420 | 7.3 | 6.9 | 35 | 134 | 181 |
| 5-yr range | 11.2-28.7 | 18-247 | <1->2420 | 6-7.4 | 0.43-34 | 2.3-420 | 6-1350 | 6.1-450 |
| Consent Limit | - | - | - | 6-9 | - | - | 100 | - |

The pH levels in all samples ranged between 7.1 and 7.3 and were within the range specified in the consent condition. The TSSs results were higher than the discharge consent limit for two of the four surveys, most notably in the August survey when the concentration was reported at 340g/m³. As discussed in section 1.4.4 samples are collected from the treatment system sump rather than the discharge point and the results may not represent the quality of water discharged into the Firewater Pond. During one survey the Company was cleaning sediment out the device.

## 2.3.4 Firewater Pond analysis IND001015

The Council collected four samples from the Firewater Pond at the inlet of the pipe (IND001015) which discharges to the Inaha Stream. The purpose of this survey is to assess the combined discharges of the stormwater and the cooling water, as well as any seepage which may occur from the ring drain around the Firewater Pond, before it discharges into the Inaha Stream. The results of the analysis are presented in Table 8. There are no consent limits for any of the parameters.

Table 8 Firewater Pond IND001015

| Parameter | Unit | Date | | | | |
|---|---|---|---|---|---|---|
| | | 15 August 2023 | 12 October 2023 | 16 November 2023 | 26 January 2024 | 28 May 2024 |
| Temp | °C | 11.7 | 14.2 | 19.8 | 21.0 | 11.4 |
| Chloride | g/m³ | 28 | 28 | 33 | 37 | 30 |
| Free Ammonia as N | g/m³ | 0.0038 | 0.0038 | 0.0061 | 0.007 | 0.0058 |
| Total Ammoniacal-N | g/m³ | 0.7 | 0.3 | 0.4 | 0.7 | 1.0 |
| Nitrate-N | g/m³ | 3.5 | 4 | 3.5 | 2.2 | 1.8 |
| Nitrate-N-Nitrite-N | g/m³ | 3.6 | 4.1 | 3.5 | 2.2 | 1.8 |
| Electrical | mS/m | 29.8 | 30 | 31.7 | 32 | 31.2 |

| Parameter | Unit | Date | | | | |
|---|---|---|---|---|---|---|
| | | 15 August 2023 | 12 October 2023 | 16 November 2023 | 26 January 2024 | 28 May 2024 |
| Conductivity | | | | | | |
| *E. coli* | MPN/100mL | 461 | 99 | 74 | 205 | 345 |
| Oil and Grease | $g/m^3$ | <4 | <4 | <4 | <5 | - |
| pH | | 7.4 | 7.7 | 7.6 | 7.4 | 7.4 |
| Total Alkalinity | $g/m^3$ as $CaCO_3$ | 80 | 75 | 79 | 90 | 87 |
| DRP | $g/m^3$ | 0.073 | 0.053 | 0.039 | 0.032 | 0.081 |
| $TBOD_5$ | g $O_2/m^3$ | 1 | 1 | 1.4 | 1.7 | 2.8 |
| Suspended Solids | $g/m^3$ | 8 | <3 | 5 | 108 | 13 |
| Turbidity | NTU | 6.9 | 2.6 | 3.4 | 19.8 | 11.7 |

## 2.4 Receiving environment monitoring

### 2.4.1 Inaha stream flow and discharge

The flow rate of the Inaha Stream is interpolated from readings of the staff gauge at the Kohiti Road bridge, based on a flow rating curve provided by Council. The flow rate is used to calculate maximum water abstraction rates and wastewater dilution rates to ensure compliance with resource consents conditions. In brief, these consents specify that:

- When flow rate is less than 100L/s discharges of wastewater from Pond 6 must cease.
- A minimum dilution ratio of 1:300 must be maintained at the point where wastewater from Pond 6 discharges into the Inaha Stream.
- A minimum flow rate of 25L/s ($0.025m^3/s$) must be maintained downstream of the abstraction point.

The data submitted by the Company shows that the Inaha Stream flow did not fall below 100L/s during the monitoring period. The lowest flow recorded was approximately 193L/s in April 2023, and the median flow was 805L/s.

Wastewater from Pond 6 was discharged to the stream for 73 days over the monitoring period, the rate of discharge ranged between 3.1L/s and 13.7L/s. The dilution rate while the discharges were occurring was greater than 1:300 at all times.

### 2.4.2 Inaha Stream temperatures

In-stream thermometers are located within the Firewater Pond which receives the cooling water discharge, and one each in the Inaha Stream above and below the Firewater Pond outlet.

Resource Consent 2050 conditions set out the following limits:

- The temperature of the cooling water discharge must not exceed 35°C where it discharges into the Inaha Stream.
- The discharge must not increase the temperature of the Inaha Stream by more than 3°C.

The maximum recorded temperature of the Firewater Pond discharge into Inaha Stream was 27°C in January 2024 (Figure 10), less than the limit of 35°C. As shown in Figure 11 the maximum temperature difference between the two instream thermometers was 1.0°C in March 2024 which is less than the consent limit of 3°C.

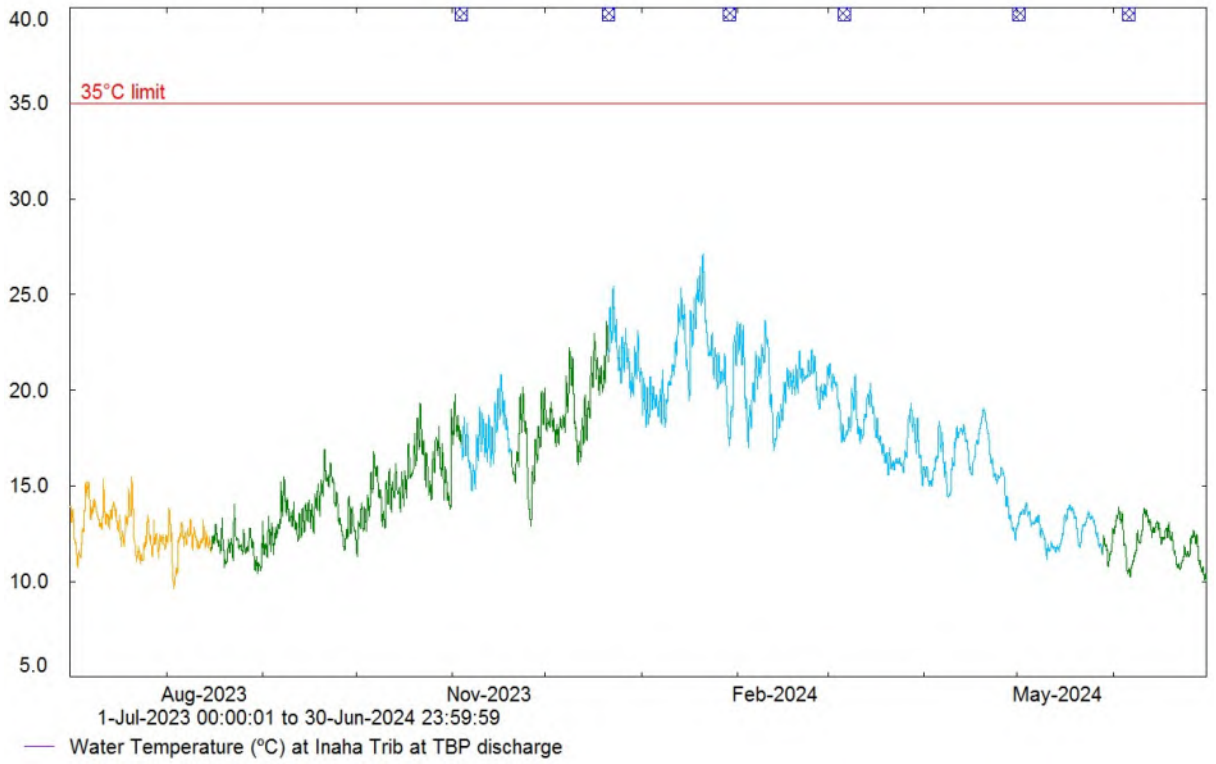


Figure 9 Temperature of Firewater Pond entering the Inaha

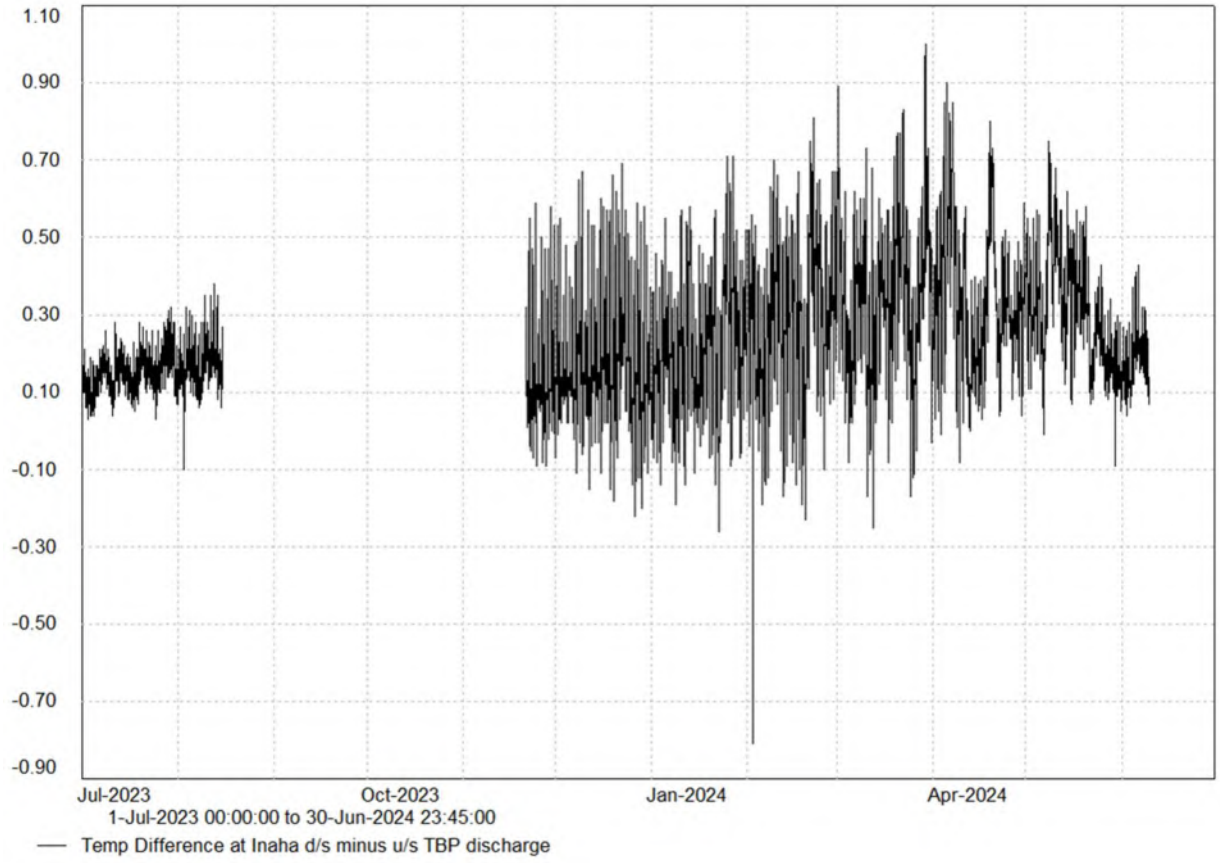


Figure 10 Temperature difference between locations upstream and downstream of the Firewater Pond discharge

## 2.4.3 Water chemistry

Water quality analysis of the Inaha Stream and associated northern and western tributaries is undertaken four times per year, approximately on a quarterly basis. In this monitoring period four rounds of surface water sampling were conducted on 15 August, 12 October and 16 November 2023, and 26 January and 28 May 2024.

### 2.4.3.1 Inaha Stream

Consent 2049-4 authorises the discharge of up to 940m³/day of treated wastewater to the Inaha Stream

The Company records show that this monitoring year the Company discharged treated wastewater to the Inaha Stream from 11 July 2023 until 20 October 2023. During that period 21,461m³ was discharged, ranging between 216 and 492m³/day, less than the consent limit (Table 9). The rate of dilution with the stream was maintained above the consent limit of 1:300.

Table 9 Consent limits on the discharge of treated wastewater into the Inaha Stream

| Parameter | Unit | Range | Consent Limit |
|---|---|---|---|
| Daily rate | m³/day | 216-492 | 940 |
| Dilution | Ratio | 303-497 | 1:300 (minimum) |
| Stream flow | L/s | 193-1793 | 100 (minimum) |

Conditions 9 and 10 of the consent state that the discharge must not result in the following measurable changes in the stream:

- A reduction in pH of greater than 0.5 units.
- An increase in dissolved carbonaceous biochemical oxygen demand (DCBOD) to above 2.0g/m³.
- An increase in temperature of greater than 3.0°C.
- A reduction in the dissolved oxygen saturation (PERSAT) concentration to below 80%.
- An increase in the total ammonia concentration below the mixing zone of 0.4/0.7/1.5g/m³ depending on whether the pH level is <7.75/7.75-8/>8 units.

The sampling sites in the tables below are listed sequentially from upstream to downstream.

- INH000334 is 1km upstream of the site and is used as a reference for the pH limit
- INH000408 is approximately the end of the mixing zone for the Firewater Pond and Pond 6 discharges
- INH000420 is approximately 500m downstream from the discharges
- INH000470 is 4km downstream from the site

The results of the laboratory analysis of the samples can be found in Table 10 to Table 13. Where applicable the results are compared against the consent limits. The ammoniacal nitrogen (adjusted) and *E. coli* results are provided for comparison against the non-statutory attributes from the National Policy Statement for Freshwater Management 2020 (NPS:FM, amended 2024).

During the surface water survey in August 2023 Pond 6 was discharging treated wastewater into the Inaha Stream. The levels of oxygen saturation (PERSAT), temperature and pH in the stream were stable (Table 10) throughout the monitored catchment. The stream temperature increased by 1.5°C between the uppermost monitoring location and the furthest downstream location, less than the consent limit. DCBOD was highest above the discharge at 1.3g/m³ reported from INH000400, while the results downstream from the end of the mixing zone were below LOD and therefore complied with the consent limit. The PERSAT concentration remained above 80% throughout the catchment.

The ammoniacal nitrogen (unadjusted) increased by 0.5g/m³ between the upstream and mixing zone monitoring locations, less than the consent limit of 0.7 (at pH 7.8). There was a notable increase in the

concentration of ammoniacal nitrogen (adjusted) with distance downstream indicating an effect from both discharges. The lowest result was 0.01g/m³ and was reported from the uppermost location. The ammoniacal nitrogen concentration increased significantly with distance downstream of the discharges. For example, the concentration at the mixing zone was two times higher than the upstream result; and the concentration at the next two locations were higher still, 0.60 and 0.54g/m³. The ammoniacal nitrogen results from this survey were all significantly higher than all other surveys this year.

The *E. coli* results levels in the stream fell within a narrow range of between 387MPN/100ml at the furthest downstream location, and 866MPN/100ml at two locations in the catchment. The *E. coli* concentration at the mixing zone was 770MPN/100ml which is equal to the upstream result. On this basis the wastewater discharge from Pond 6 does not contribute significant amounts of *E. coli* to the Inaha Stream during high flow conditions.

The results of all discharge and stream parameters listed in the consent conditions comply with the relevant limits. While the remaining analytes do not have specific limits, changes in these parameters are indicative of impact on downstream water quality from the discharge. In general terms the remaining results do not indicate a significant trend in water quality below the mixing zone.

Table 10 Inaha Stream surface water monitoring survey on 15 August 2023

| Site | PERSAT (%) | Temp (°C) | Dissolved C-Biochemical Oxygen Demand (g/m³) | Total Ammoniacal-N(g/m³) | Total ammoniacal N adjusted (g/m³) | pH | *E. coli (MPN/100ml)* |
|---|---|---|---|---|---|---|---|
| INH000334 | 99.5 | 8.8 | - | 0.02 | 0.01 | 7.7 | 770 |
| INH000348 | 100.8 | 9.2 | - | 0.38 | 0.26 | 7.8 | 866 |
| INH000400 | 99.8 | 9.2 | 1.3 | 0.29 | 0.20 | 7.8 | 770 |
| INH000408 | 99.6 | 9.7 | 1 | 0.78 | 0.48 | 7.6 | 770 |
| INH000420 | 99.4 | 9.8 | < 1.0 | 0.88 | 0.60 | 7.8 | 613 |
| INH000430 | 98.4 | 10.1 | < 1.0 | 0.80 | 0.54 | 7.8 | 579 |
| INH000450 | 98.4 | 10 | < 1.0 | 0.63 | 0.43 | 7.8 | 866 |
| INH000470 | 96.2 | 10.3 | - | 0.36 | 0.20 | 7.5 | 387 |

On 12 October 2023 a one-off limited survey was conducted to collect additional data on water quality during the discharge from Pond 6. Samples were collected from the monitoring locations upstream and downstream of the discharge point and the results are presented in Table 11 below.

The ammoniacal nitrogen (unadjusted) concentration increased by 0.2g/m³ after the discharge which is less than the consent limit of 0.7 (at pH 7.8). PERSAT was above the consent limit of 80% at all monitoring locations. The pH, temperature difference and DCBOD results all complied with the consent limits.

The ammoniacal nitrogen (adjusted) results show a clear upward trend, increasing from 0.01g/m³ above the Firewater and Pond and Pond 6 discharge points, to 0.15g/m³ below the mixing zone. There is also an increasing trend in the *E. coli* results with the downstream result 180MPN/100ml higher than the upstream result.

Table 11 Inaha Stream surface water monitoring survey on 12 October 2023

| Site | PERSAT (%) | Temp (°C) | Dissolved C-Biochemical Oxygen Demand (g/m³) | Total Ammoniacal-N(g/m³) | Total ammoniacal N adjusted (g/m³) | pH | *E. coli (MPN/100ml)* |
|---|---|---|---|---|---|---|---|
| INH000400 | 103 | 12.2 | < 1.0 | 0.02 | 0.01 | 7.8 | 866 |
| INH000408 | 100 | 11.5 | < 1.0 | 0.22 | 0.15 | 7.8 | 980 |
| INH000420 | 99.7 | 11.2 | < 1.0 | 0.33 | 0.22 | 7.8 | 1046 |

At the time of the November sampling survey there was no discharge from Pond 6 occurring, it had been 27 days since the last discharge and no rain had fallen during the preceding six days. The oxygen saturation (PERSAT), temperature and pH parameters were stable with distance downstream (Table 12) and complied with the relevant consent limits. Temperature increased with distance, ranging from 15.1 at the top of the catchment to 18.3 at the lower irrigation area near Normanby Road.

The ammoniacal nitrogen (adjusted) results are significantly lower overall than when Pond 6 is discharging treated wastewater. The concentrations ranged from 0.01 to 0.06g/m$^3$, although the highest results were also immediately downstream of the usual Pond 6 discharge location and decreased with distance.

The *E. coli* concentrations in samples from this survey were notably higher than the previous survey, with five of the results exceeding the highest reported from the previous survey, 866MPN/100ml. Three of these occurred at the uppermost three locations in the catchment. The highest result was >2,420MPN/100ml was reported from the first sample location indicating that there was a high loading in the Inaha before it reached the Company's site.

Table 12 Inaha Stream surface water monitoring survey on 16 November 2023

| Site | PERSAT (%) | Temp (°C) | Dissolved C-Biochemical Oxygen Demand (g/m$^3$) | Total Ammoniacal-$NH_3$ (g/m$^3$) | Total ammoniacal N adjusted (g/m$^3$) | pH | *E. coli (MPN/100ml)* |
|---|---|---|---|---|---|---|---|
| INH000334 | 103.2 | 15.1 | - | 0.01 | 0.01 | 8.0 | > 2420 |
| INH000348 | 103 | 15.7 | - | 0.01 | 0.01 | 8.0 | 1120 |
| INH000400 | 103.2 | 15.7 | <1.0 | 0.02 | 0.02 | 8.0 | 1553 |
| INH000408 | 103.6 | 16 | < 1.0 | 0.06 | 0.06 | 8.0 | 770 |
| INH000420 | 103.7 | 16.6 | < 1.0 | 0.06 | 0.06 | 8.0 | 1203 |
| INH000430 | 104.4 | 18.3 | < 1.0 | 0.04 | 0.04 | 8.0 | 613 |
| INH000450 | 103 | 18.2 | < 1.0 | 0.03 | 0.03 | 8.1 | 980 |
| INH000470 | 108.1 | 17.9 | - | 0.01 | 0.01 | 8.1 | 816 |

There was no discharge from Pond 6 during this survey because the water volume in the Inaha Stream during summer is generally too low. Approximately 0.5mm of rain had fallen during the previous six days. The stream temperature varied by 3°C from the top monitoring location to the lower reach of the Inaha Stream. Ammoniacal nitrogen (adjusted) concentrations remained low, ranging from 0.01 to 0.11g/m$^3$. The highest concentration was again reported at the monitoring location immediately downstream from the usual Pond 6 discharge point indicating a source of contaminants in this area. There was no significant change in the PERSAT and pH results with distance downstream.

The concentration of *E. coli* in the catchment was relatively high compared to the two previous surveys, ranging between 649-1986MPN/100ml. Notably, the second highest result was at the first location in the catchment, indicating that *E. coli* loadings were elevated prior to entering the Company's property.

Table 13 Inaha Stream surface water monitoring survey on 26 January 2024

| Site | PERSAT (%) | Temp (°C) | Dissolved C-Biochemical Oxygen Demand (g/m$^3$) | Total Ammoniacal-N (g/m$^3$) | Total ammoniacal N adjusted (g/m$^3$) | pH | *E. coli (MPN/100ml)* |
|---|---|---|---|---|---|---|---|
| INH000334 | 109.5 | 16.2 | - | 0.01 | 0.01 | 8.1 | 1553 |
| INH000348 | 109.6 | 16.6 | - | 0.01 | 0.01 | 8.0 | 649 |
| INH000400 | 103.1 | 16.3 | < 1.0 | 0.01 | 0.01 | 8.0 | 1203 |
| INH000408 | 99.6 | 16.6 | < 1.0 | 0.11 | 0.11 | 8.0 | 1414 |

| Site | PERSAT (%) | Temp (°C) | Dissolved C-Biochemical Oxygen Demand ($g/m^3$) | Total Ammoniacal-N ($g/m^3$) | Total ammoniacal N adjusted ($g/m^3$) | pH | *E. coli (MPN/100ml)* |
|---|---|---|---|---|---|---|---|
| INH000420 | 100.3 | 17.5 | < 1.0 | 0.06 | 0.06 | 8.0 | 1120 |
| INH000430 | 107.2 | 19.3 | < 1.0 | 0.01 | 0.01 | 8.1 | 980 |
| INH000450 | 100.2 | 19.1 | < 1.0 | 0.02 | 0.02 | 8.1 | 687 |
| INH000470 | 114.6 | 18.2 | - | 0.01 | 0.01 | 8.1 | 1986 |

The Company records show that 6.5mm of rain fell the day before the survey, and a further 2.5mm fell on the day of the survey. As with the previous surveys the concentration of ammoniacal nitrogen (adjusted) was highest at the four monitoring locations immediately downstream from the Pond 6 outlet even though no discharge was occurring at the time. Monitoring site INH000408 reported an ammoniacal nitrogen concentration of $0.11g/m^3$, six times higher than the concentration at the location upstream of the discharge which was $0.02g/m^3$. DCBOD (LOD), temperature (1.8°C) and pH (0.2 unit) results showed only slight variation with distance downstream.

The range of *E. coli* results from this survey were the lowest of the year, the minimum result was 201MPN/100ml reported from mid-catchment and the second-highest result was 548MPN/100ml reported from the top of the catchment. The furthest downstream location reported the highest result of 1,203MPN/100ml.

Table 14 Inaha Stream surface water monitoring survey on 28 May 2024

| Site | PERSAT (%) | Temp (°C) | Dissolved C-Biochemical Oxygen Demand ($g/m^3$) | Total Ammoniacal-$NH_3$ ($g/m^3$) | Total ammoniacal N adjusted ($g/m^3$) | pH | *E. coli (MPN/100ml)* |
|---|---|---|---|---|---|---|---|
| INH000334 | 101.7 | 9.4 | -- | 0.01 | 0.01 | 7.8 | 548 |
| INH000348 | 100.1 | 10.1 | | 0.01 | 0.01 | 7.8 | 435 |
| INH000400 | 97.2 | 9.8 | < 1.0 | 0.02 | 0.01 | 7.7 | 461 |
| INH000408 | 99 | 10.5 | < 1.0 | 0.11 | 0.07 | 7.7 | 249 |
| INH000420 | 96.1 | 10.2 | < 1.0 | 0.07 | 0.04 | 7.7 | 210 |
| INH000430 | 101.3 | 10.7 | < 1.0 | 0.03 | 0.02 | 7.8 | 201 |
| INH000450 | 95 | 10.7 | < 1.0 | 0.03 | 0.02 | 7.7 | 387 |
| INH000470 | 101.9 | 11.2 | - | 0.01 | 0.01 | 7.9 | 1203 |

#### 2.4.3.2 Northern tributary

The Northern tributary flows for a distance of 640m through a portion of the site used to irrigate wastewater, before joining the Inaha Stream immediately above Kohiti Road. The only monitoring site is at its confluence with Inaha stream at sampling site INH000397 which is upstream from the wastewater discharge point. Water quality is primarily a result of diffuse discharges via groundwater from the irrigation paddocks. The results of the sample analyses collected during this monitoring period are provided in Table 15. There are no consent conditions which limit the concentration of contaminants in the tributary from the irrigation of wastewater to land.

The results of the analysis of the samples collected from the Northern Tributary show a small variation over the monitoring year, however they are largely within the five-year range of results from this location. *E. coli* concentrations in all samples this year were high, ranging from 816 to >2,420MPN/100ml, and remain well above the Council's and NPS:FM guideline values for contact recreation, although there are no recognised recreation areas along this stretch of the tributary.

Ammoniacal nitrogen results ranged between 0.03 and 0.07g/m$^3$ during the year. The 95$^{th}$ percentile is 0.07g/m$^3$ placing this part of the tributary in the NPS:FM attribute band B.

Nitrite+nitrate+nitrogen (NNN) measurements have been collected since 1999 and provide a long-term indicator of nitrate-nitrogen concentrations in the tributary. Concentrations varied during this monitoring period, the highest result of 4.7g/m$^3$ occurred on 15 August 2023 and was slightly higher than the five-year maximum. The result is less than the Maximum Acceptable Value for nitrate-nitrogen in drinking water of 11.3mg/L (11.3g/m$^3$). There are no known sources of drinking water near this section of the Northern Tributary. In accordance with the NPS:FM the annual 95 percentile nitrate result (4.7g/m$^3$) classifies the stream as attribute band C, below the national bottom line, at which there will be some growth effects on up to 20% of, mainly sensitive, species.

Table 15 Northern Tributary sampling results during the monitoring period site INH000397

| Parameter (unit) | Unit | Date collected | | | | 5-yr range |
|---|---|---|---|---|---|---|
| | | 15 August 2023 | 16 November 2023 | 26 January 2024 | 28 May 2024 | 2018-2023 |
| DO | g/m$^3$ | 11.0 | 9.9 | 8.9 | 9.9 | 8.3-12.3 |
| Temperature | °C | 9.5 | 14.6 | 15.1 | 10.4 | 6.9-17.1 |
| Chloride | g/m$^3$ | 31 | 29 | 35 | 45 | 30-42 |
| DRP | g/m$^3$ | 0.021 | 0.028 | 0.006 | 0.006 | 0.009-0.44 |
| Condy | mS/m | 29.8 | 29.6 | 30.7 | 37.2 | 27.5-34.4 |
| *E. coli* | MPN/100ml | 816 | 1046 | >2,420 | 921 | 158->2420 |
| pH | | 7.7 | 7.8 | 8.1 | 7.6 | 7.4-7.9 |
| Free Ammonia $NH_3$ | g/m$^3$ | 0.0004 | 0.0014 | 0.0019 | 0.0007 | 0.00009-0.0028 |
| Nitrate-N + Nitrite-N | g/m$^3$ | 4.7 | 3.7 | 1.6 | 1.2 | 1.85-4 |
| Total Ammoniacal-N (adjusted) | g/m$^3$ | 0.03 | 0.06 | 0.07 | 0.07 | 0.01-0.28 |
| $TBOD_5$ | g $O_2$/m$^3$ | 0.5 | 0.6 | <0.4 | 0.8 | 0.4-2.4 |
| Turbidity | FNU | 14.3 | 7.9 | 2.6 | 4.1 | 1.63-44 |

#### 2.4.3.3 Western tributary

The Western tributary flows for a distance of 3.5km through paddocks which are used by the Company to irrigate wastewater and joins the Inaha Stream at Normanby Road 900m south of the Pond 6 wastewater discharge point. The tributary is monitored at three points; INH000433 (upstream of the Company farm), INH000435 (2.5km above the Inaha confluence) and INH000440 (200m before the confluence with the Inaha Stream).

During this monitoring period three surveys were conducted at all three monitoring sites in the Western tributary.

Laboratory analysis of the western tributary samples indicates a progressive decline in two water quality parameters with distance downstream. During each of the surveys the concentration of NNN increased with distance downstream. The most significant increase was during the May 2024 survey when NNN increased from 0.25 to 16.3g/m$^3$ over the course of the stream. The sampling was preceded by five days of rainfall which may have flushed nutrients into the stream. Conversely, ammoniacal nitrogen declined with distance downstream, from 0.041g/m$^3$ to below LOD. *E. coli* and dissolved reactive phosphorous also decreased with distance downstream. The remaining parameters showed only slight variation.

Over the monitoring year the ammoniacal nitrogen results were 0.01g/m$^3$ except for one result from INH000433 in May when it was 0.02g/m$^3$. In accordance with the NPS:FM the 95$^{th}$ percentile of the results is Western Tributary 0.01g/m$^3$ which falls under attribute Band A (99% species protection). The 95$^{th}$ percentile

of the *E. coli* results is >1916 which is in the E attribute band and would pose a high risk of infection to people using the stream for contact recreation such as swimming (the NPS:FM requires monthly monitoring to properly determine the attribute band). However, there are no recognised contact recreation areas in the tributary.

In accordance with the NPS:FM the annual 95 percentile nitrate result is13.3g/$m^3$which classifies the stream as attribute band D, below the national bottom line, at which there will be significant growth effects on multiple species.

Table 16 Surface water sampling of the Western tributary on 15 August 2023

| Parameter | Unit | Site | | |
|---|---|---|---|---|
| | | INH000433 | INH000435 | INH000440 |
| DO | g/$m^3$ | 10.43 | 10.81 | 11.11 |
| PERSAT | % | 94 | 97 | 99 |
| Temperature | °C | 10.2 | 9.8 | 9.6 |
| Chloride | g/$m^3$ | 34 | 39 | 45 |
| DRP | g/$m^3$ | 0.01 | 0.01 | 0.01 |
| Electrical Conductivity | mS/m | 31.6 | 33.9 | 38.3 |
| *E. coli* | MPN/100mL | 833 | 921 | 687 |
| pH | | 7.8 | 7.6 | 7.6 |
| Free Ammonia $NH_3$ | g/$m^3$ | <0.00012 | 0.00009 | 0.00015 |
| Nitrate-N + Nitrite-N | g/$m^3$ | 3.7 | 6.0 | 9.7 |
| Total Ammoniacal-N (adjusted) | g/$m^3$ | 0.01 | 0.01 | 0.01 |
| $TBOD_5$ | g $O_2$/$m^3$ | <0.4 | <0.4 | <0.4 |
| Turbidity | FNU | 25 | 8.3 | 11.9 |

Table 17 Surface water sampling of the Western tributary on 23 November 2023

| Parameter | Unit | Site | | |
|---|---|---|---|---|
| | | INH000433 | INH000435 | INH000440 |
| DO | g/$m^3$ | 9.14 | 9.25 | 10.93 |
| PERSAT | % | 91.5 | 94.7 | 112.4 |
| Temperature | °C | 15 | 16.1 | 16.5 |
| Chloride | g/$m^3$ | 30 | 37 | 46 |
| DRP | g/$m^3$ | 0.01 | 0.01 | 0.01 |
| Electrical Conductivity | mS/m | 31.6 | 34.8 | 40.8 |
| *E. coli* | MPN/100mL | 921 | 1300 | 613 |
| pH | | 7.8 | 7.8 | 8.2 |
| Free Ammonia NH3 | g/$m^3$ | < 0.00018 | < 0.00019 | < 0.0005 |
| Nitrate-N + Nitrite-N | g/$m^3$ | 2.9 | 4.5 | 9.7 |
| Total Ammoniacal-N (adjusted) | g/$m^3$ | 0.01 | 0.01 | 0.01 |
| TBOD5 | g $O_2$/$m^3$ | 0.4 | 0.6 | 0.6 |
| Turbidity | FNU | 13.6 | 6 | 3.1 |

Table 18 Surface water sampling of the Western tributary on 28 May 2024

| Parameter | Unit | Site | | |
|---|---|---|---|---|
| | | INH000433 | INH000435 | INH000440 |
| DO | $g/m^3$ | 8.81 | 9.75 | 9.97 |
| PERSAT | % | 80.1 | 89.4 | 91.3 |
| Temperature | °C | 10.4 | 10.8 | 10.8 |
| Chloride | $g/m^3$ | 56 | 64 | 77 |
| DRP | $g/m^3$ | 0.007 | 0.005 | <0.004 |
| Electrical Conductivity | mS/m | 61.5 | 51.2 | 58.5 |
| *E. coli* | MPN/100mL | >2420 | 687 | 167 |
| pH | | 7.2 | 7.5 | 7.7 |
| Free Ammonia $NH_3$ | $g/m^3$ | 0.00014 | 0.0017 | <0.0001 |
| Nitrate-N + Nitrite-N | $g/m^3$ | 0.25 | 5.4 | 16.3 |
| Total Ammoniacal-N (adjusted) | $g/m^3$ | 0.01 | 0.02 | 0.01 |
| $TBOD_5$ | $g\ O_2/m^3$ | 1.2 | 0.4 | <0.4 |
| Turbidity | FNU | 44 | 2.2 | 2.4 |

### 2.4.4 Irrigation area loading and groundwater monitoring

The Company holds Consent 3941-2 which provides for the discharge of up to 1,400$m^3$/day of treated wastewater from their rendering operation onto and into land in the vicinity of the Inaha Stream and its tributaries.

The wastewater is monitored by both the Company and the Council. the Company measures and records wastewater volumes discharged on each paddock daily, and analyses nitrogen constituents of the wastewater at approximately weekly intervals.

Monitoring by the Council included the following:

- inspection of the irrigation areas;
- effluent analysis;
- chemical and biological surveys of the Inaha Stream;
- sampling from the groundwater bores installed around the irrigation areas; and
- sampling of Te Kopanga spring situated near an irrigation area which is used to supply several households.

Table 18 provides a comparison of this year's wastewater and nitrogen loading rates to land compared to the previous three monitoring periods. The data was compiled by the Company and provided to the Council as monthly reports.

Table 19 2020-2024 comparison loading rates of wastewater and fertiliser

| Parameter (unit) | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
|---|---|---|---|---|
| Land application area (ha) | 250.9 | 238.9 | 251.1 | 262.0 |
| Total nitrogen (kg N/year) | 34,002 | 14,642 | 34,276 | 27,908 |
| Calculated average loading rate (kg N/ha/year) | 135.5 | 61.3 | 136.5 | 106.5 |

The total volume of nitrogen (in wastewater) irrigated to land this monitoring year was 27,908kg which is a decrease of 6,368kg compared to the last monitoring year. The average N loading rate across the whole irrigation area was 106.5kg over 262.0ha, and the N loading rate in all paddocks ranged between 7.7 and 253.8k/ha/year, less than the consent limit of 300kg/ha/year.

### 2.4.4.1 Groundwater monitoring of the irrigation areas

Monitoring of the nine groundwater wells and one spring within the vicinity of the irrigation area is undertaken to assess the effects of the land-based applications of wastewater. Ammoniacal nitrogen and nitrate-nitrite-nitrogen (NNN) are the main contaminants of concern as contribute to elevated surface water concentrations. The NPS:FM includes ammoniacal nitrogen as an attribute but there are no standards or guidelines for ecological or cultural effects of NNN on groundwater.

During this monitoring period five rounds of groundwater monitoring were undertaken and the results for each sampling site are provided in the following tables.

**GND1054:** This bore is located in irrigation paddock 34 between the Inaha Stream and the northern tributary and received 1,402kgN this monitoring year. The results of the surveys show that the groundwater in this area is relatively stable as all parameters changed only slightly over the monitoring year.

Table 20 GND1054 groundwater sampling results for the 2023/24 monitoring period

| GND1054 | August 2023 | November 2023 | February 2024 | May 2024 | June 2024 |
|---|---|---|---|---|---|
| Level (m) | 6.92 | 7.52 | 7.44 | 7.91 | 6.83 |
| Temp (°C) | 13.7 | 16.9 | 15.5 | 14.2 | 14.7 |
| Chloride (g/m3) | 47 | 44 | 46 | 48 | 47 |
| Electrical Conductivity (mS/m) | - | 34.3 | 32.3 | 38.4 | 42.0 |
| *E. coli* (mpn/100mL) | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nitrate-N + Nitrite-N ($g/m^3$) | 15.5 | 15.7 | 15.7 | 15.9 | 17.8 |
| pH | 6.6 | 6.6 | 6.3 | 6.6 | 6.6 |
| Total Ammoniacal-N ($g/m^3$) | <0.010 | <0.010 | <0.010 | <0.10 | <0.010 |

**GND1056**: Monitoring bore GND1056 is located in irrigation paddock 12A east of the treatment ponds and 370m from the Inaha Stream. The paddock did not receive any wastewater this year. NNN results remained low overall, the highest concentration was in November 2023 with a concentration of 10.4$g/m^3$ (Table 20). All other results showed only slight variations throughout the monitoring period. Ammoniacal nitrogen and *E. coli* were mostly below LOD.

Table 21 GND1056 groundwater sampling results for the 2023/24 monitoring period

| GND1056 | August 2023 | November 2023 | February 2024 | May 2024 | June 2024 |
|---|---|---|---|---|---|
| Level (m) | 6.86 | 7.91 | 8.42 | 9.07 | 8.35 |
| Temp (°C) | 14.3 | 16.6 | 16.0 | 14.5 | 15.1 |
| Chloride ($g/m^3$) | 43 | 42 | 47 | 44 | 45 |
| Electrical Conductivity (mS/m) | 25.82 | 28 | 27.5 | 29.59 | - |
| *E. coli* (MPN/100mL) | 2 | < 1 | < 1 | < 1 | 1 |
| Nitrate-N + Nitrite-N ($g/m^3$) | 9.9 | 10.4 | 10.3 | 9.1 | 9.2 |
| pH | 7.2 | 6.7 | 6.8 | 6.6 | 6.7 |
| Total Ammoniacal-N ($g/m^3$) | <0.010 | <0.010 | <0.010 | <0.010 | < 0.10 |

**GND1057:** This monitoring bore is located in irrigation paddock 14/15 south of the rendering plant and 200m from a tributary of the Inaha Stream. The paddock received 935 kgN this year, and was planted with maize or grass for part of the year. The water quality in this bore was also relatively stable through the monitoring year; chloride, pH and ammoniacal nitrogen varied only slightly. The samples returned NNN concentrations of between 12.1 and 17.7g/m$^3$. There was no ammoniacal nitrogen at detectable levels during any survey.

Table 22 GND1057 groundwater sampling results for the 2023/24 monitoring period

| GND1057 | August 2023 | November 2023 | February 2024 | May 2024 | June 2024 |
|---|---|---|---|---|---|
| Level (m) | 5.18 | 5.92 | 6.11 | 6.61 | 5.96 |
| Temp (°C) | 14.1 | 16.1 | 16.3 | 14.4 | 14 |
| Chloride (g/m$^3$) | 48 | 42 | 42 | 45 | 44 |
| Electrical Conductivity (mS/m) | 33.59 | 32.66 | 31.46 | 35.25 | 30.2 |
| *E. coli* (MPN/100mL) | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nitrate-N + Nitrite-N (g/m$^3$) | 17.7 | 13.5 | 12.5 | 12.1 | 12.9 |
| pH | 7.0 | 6.6 | 6.6 | 6.6 | 6.7 |
| Total Ammoniacal-N (g/m$^3$) | <0.010 | <0.010 | <0.010 | <0.010 | < 0.10 |

**GND1058**: This monitoring location is a natural spring well, rather than a groundwater bore, which supplies a small number of nearby houses with potable water (Table 22) and is located on a property adjacent to fields owned by the Company. It also holds significant value for the local hapū, Ngāti Manuhiakai, which has named it Te Kopanga Spring. The nearest irrigation area is paddock 16 which received 614kgN during the monitoring year. The closest point to the spring is 106m. As this is a source of drinking water the results are compared against the Drinking Water Standards of New Zealand (DWSNZ, MfE, revised 2018).

The 2023/24 results for chloride ranged between 57 and 61g/m$^3$ which are significantly less than the DWSNZ guideline value for drinking water of 250g/m$^3$ (Table 22). The pH levels were found to be between 6.7 and 7.6 which is mostly inside the guideline range recommended by the DWSNZ. The exceptions are the August and November results which were 6.7. The pH of drinking water affects the taste of water only and does not have health effects except at the extreme ends of the pH scale.

The results show that the presence of *E. coli* in the November 2023 and June 2024 samples exceeded the maximum exposure value (MAV) of <1/100mL. *E. coli* is used as an indicatior of the presence of faecal contamination in water and can be present in human and animal wastewater discharges and bird droppings.

Table 23 GND1058 groundwater sampling results for the 202/24 monitoring period (exceedances of MAV in **bold**)

| GND1058 | August 2023 | November 2023 | February 2024 | May 2024 | June 2024 | DWSNZ |
|---|---|---|---|---|---|---|
| Level (m) | | | | | | - |
| Temp (°C) | 14.1 | 14.36 | 14.5 | 13.8 | 13.6 | |
| Chloride (g/m$^3$) | 58 | 59 | 61 | 58 | 57 | 250 (taste only) |
| Electrical Conductivity (mS/m) | 35.2 | 36.3 | 35.2 | 36.0 | 35.5 | - |
| *E. coli* (MPN/100mL) | < 1 | **12** | < 1 | < 1 | **4** | <1/100 |
| Nitrate-N + Nitrite-N (g/m$^3$) | 5.8 | 6.1 | 5.3 | 4.4 | 4.3 | 50 |
| pH | 6.7 | 6.7 | 7.6 | 7.0 | 7.1 | 7.0-8.5 (taste only) |

Long term (10 year) monitoring data for nitrate, using NNN as a proxy, indicates that the concentrations in the spring have increased slightly (Figure 13), although there has been an overall decline in the last five years. In August 2015 the NNN present in the spring reached a maximum concentration of 7.8g/m$^3$. The

NNN concentration peaked again in September 2017 with a concentration of 7.2 g/m³, but then declined to 3.7g/m³ in August 2020. Since then, the NNN concentrations measured during monitoring increased to 6.9g/m³ in the September 2022 survey. The lowest result for this monitoring year was 4.3g/m³ in June 2024. The results are below the DWSNZ short-term exposure MAV for nitrate of 50g/m³.

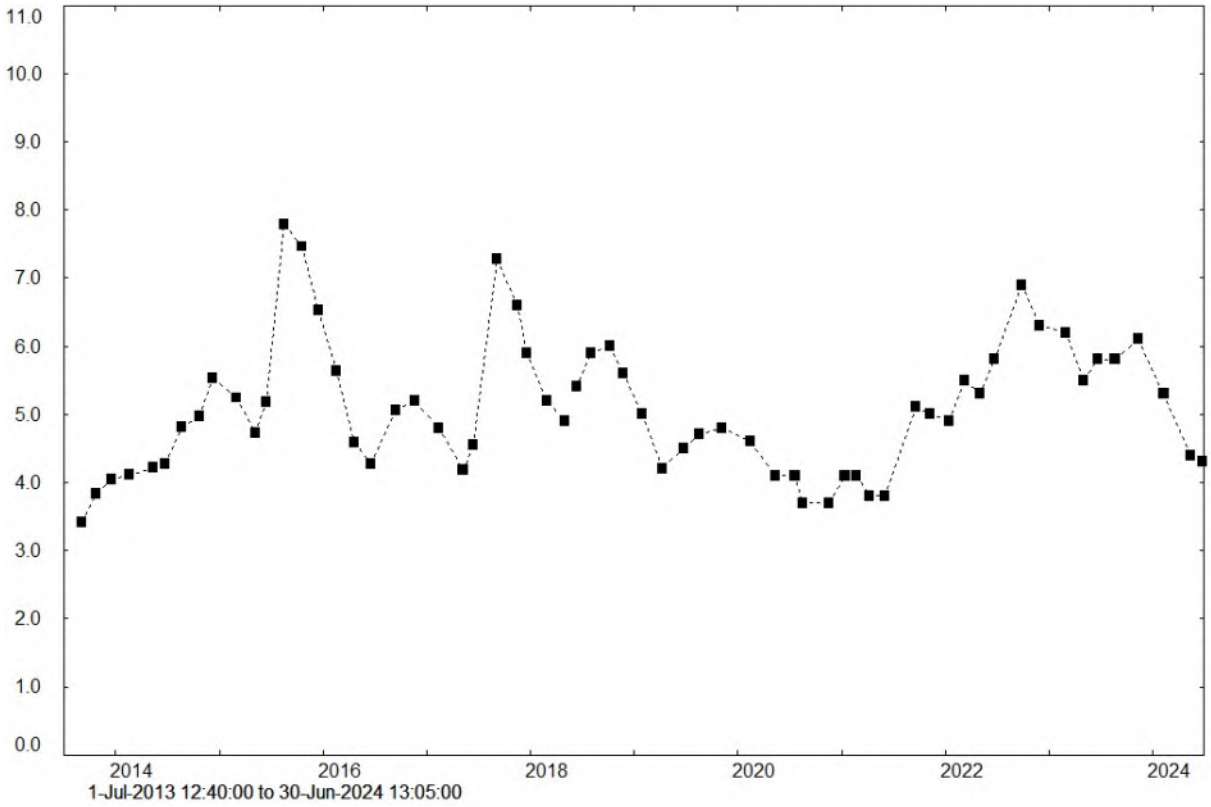


Figure 11 NNN concentration in samples 2013-2024

**GND1346:** This monitoring bore is located in paddock 36,500m from both the Inaha Stream and the Western Tributary. The paddock received a high nitrogen loading compared to the other monitored paddocks, receiving 1,205kgN over the monitoring year. The results of this monitoring period show NNN were higher than most other sites, with all results ranging between 63g/m³ in August 2023 and increasing through the year to 83g/m³ in June 2024. (Table 23). Three surveys found detectable levels of *E. coli*, and in the November survey the concentration was 41MPN/100ml which is significantly higher than any other result this year. The November survey also reported ammoniacal nitrogen above the LOD at 0.023g/m³.

Table 24 GND1346 groundwater sampling results for the 2023/24 monitoring period

| Parameter | August 2023 | November 2023 | February 2024 | May 2024 | June 2024 |
|---|---|---|---|---|---|
| Level (m) | 4.08 | 4.4 | 4.68 | 4.95 | 3.7 |
| Temp (°C) | 14.3 | 15.7 | 21.8 | 14.9 | 16.9 |
| Chloride (g/m³) | 134 | 137 | 141 | 138 | 142 |
| Electrical Conductivity (mS/m) | 105.5 | 106.9 | 111.3 | 114.0 | 113.3 |
| *E. coli* (MPN/100mL) | 3 | 41 | < 1 | 2 | < 1 |
| Nitrate-N + Nitrite-N (g/m³) | 63 | 67 | 70 | 75 | 83 |
| pH | 6.9 | 6.3 | 6.3 | 6.3 | 6.8 |
| Total Ammoniacal-N (g/m³) | <0.010 | <0.010 | <0.010 | <0.010 | 0.023 |

**GND1347:** This bore is located in paddock 19 and is 83m from an unnamed tributary of the Inaha Stream. The paddock received 1,301kgN this year. The results of this monitoring period show NNN were also high compared to other monitoring sites, with all results 63g/m$^3$ or higher (Table 24). The concentration increased over the monitoring year. The level of *E. coli* in all samples were below the level of detection.

Table 25 GND1347 groundwater sampling results for the 2023/24 monitoring period

| Parameter | August 2023 | November 2023 | February 2024 | May 2024 | June 2024 |
|---|---|---|---|---|---|
| Level (m) | 8.99 | 7.61 | 7.61 | 8.67 | 7.39 |
| Temp (°C) | 12.8 | 14.6 | 15.7 | 14.3 | 14.4 |
| Chloride (g/m$^3$) | 104 | 111 | 113 | 114 | 113 |
| Electrical Conductivity (mS/m) | 96.3 | 101.8 | 104.0 | 105.9 | 105.4 |
| *E. coli* (MPN/100mL) | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nitrate-N + Nitrite-N (g/m$^3$) | 71 | 72 | 76 | 70 | 77 |
| pH | 7.0 | 6.0 | 6.0 | 6.0 | - |
| Total Ammoniacal-N (g/m$^3$) | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |

**GND1348**: this bore is in paddock 8 and is 80m from Inaha Stream. The paddock received 844kgN this year. The results of this monitoring period show NNN was 55g/m$^3$ or higher (Table 24) in all samples. The concentration generally fluctuated over the monitoring period up to a maximum of 64g/m$^3$. The level of *E. coli* in the samples were less than the level of detection, except in November 2022 when the result was 4MPN/100mL.

Table 26 GND1348 groundwater sampling results for the 2023/24 monitoring period

| Parameter | August 2023 | November 2023 | February 2024 | May 2024 | June 2024 |
|---|---|---|---|---|---|
| Level (m) | 8.94 | 9.69 | 9.7 | 10.38 | 9.68 |
| Temp (°C) | 13.9 | 17.8 | 15.9 | 14.3 | 14.9 |
| Chloride (g/m$^3$) | 108 | 110 | 108 | 110 | 111 |
| Electrical Conductivity (mS/m) | 95.7 | 96.9 | 96.0 | 89.5 | 87.3 |
| *E. coli* (MPN/100mL) | < 1 | < 1 | < 1 | < 1 | < 1 |
| Nitrate-N + Nitrite-N (g/m$^3$) | 64 | 62 | 62 | 55 | 60 |
| pH | 6.6 | 6.2 | 6.2 | 6.2 | - |
| Total Ammoniacal-N (g/m$^3$) | <0.010 | <0.010 | <0.010 | <0.010 | 0.011 |

**GND1349:** The monitoring bore is located in paddock 26 which received 920kgN this year. Chloride, electrical conductivity and pH remained stable throughout the monitoring year, while *E.* coli was at or below LOD except for the last sample which reported a concentration of 5MPN/100ml. Ammoniacal nitrogen remained below the LOD and NNN results ranged between 60 and 70g/m$^3$ but showed no clear trend.

Table 27 GND1349 groundwater sampling results for the 2023/24 monitoring period

| Parameter | August 2023 | November 2023 | February 2024 | May 2024 | June 2024 |
|---|---|---|---|---|---|
| Level (m) | 8.88 | 9.76 | 10.08 | 10.64 | 9.69 |
| Temp (°C) | 13.9 | 15.1 | 16.1 | 14.3 | 14 |
| Chloride (g/m$^3$) | 103 | 101 | 106 | 111 | 115 |
| Electrical Conductivity (mS/m) | 104.4 | 102.6 | 100.7 | 108.8 | 111.7 |
| *E. coli* (MPN/100mL) | < 1 | 1 | < 1 | < 1 | 5 |
| Nitrate-N + Nitrite-N (g/m$^3$) | 70 | 68 | 60 | 60 | 70 |
| pH | 6.2 | 6.0 | 6.1 | - | - |
| Total Ammoniacal-N (g/m$^3$) | <0.010 | <0.010 | <0.010 | <0.010 | < 0.10 |

**GND2225**: Located in paddock 39, this monitoring bore is 90m from the Western Tributary and received 937kgN this year. With the exception of *E. coli* all parameters were within a very narrow range indicating that contaminants in the irrigation wastewater were being assimilated efficiently. *E. coli* results concentrations were below LOD for the first four surveys of the year, but in June 2024 the sample collected from the bore contained 12,000cfu/100mL. The high result indicated that the sample had likely been contaminated and so the bore was retested on 5 July 2024. The sample contained 12cfu/100ml which is consistent with historical results.

Table 28 GND2225 groundwater sampling results for the 2023/24 monitoring period

| Parameter | August 2023 | November 2023 | February 2024 | May 2024 | June 2024 |
|---|---|---|---|---|---|
| Level (m) | 5.48 | 6.06 | 5.84 | 6.21 | 5.5 |
| Temp (°C) | 14.6 | 14.9 | 19.9 | - | 14.3 |
| Chloride (g/m$^3$) | 98 | 97 | 100 | - | 97 |
| Electrical Conductivity (mS/m) | 67.2 | 65.3 | 65.6 | - | 65.9 |
| *E. coli* (MPN/100mL) | < 1 | < 1 | < 1 | < 1 | 12,000 |
| Nitrate-N + Nitrite-N (g/m$^3$) | 28 | 27 | 27 | - | 28 |
| pH | 6.2 | 6.2 | 6.2 | - | 6.5 |
| Total Ammoniacal-N (g/m$^3$) | <0.010 | <0.010 | <0.010 | - | < 0.10 |

**GND2226**: This bore is located in paddock 29 and is 450m from the Western Tributary. The results from this year's monitoring indicate very stable sub-surface conditions, with chloride, electrical conductivity and pH remaining within very narrow ranges, and ammoniacal nitrogen remaining below the LOD throughout the year. The NNN concentration results from the 2023/24 monitoring period ranged from 67g/m$^3$ in May 2024 to 76g/m$^3$ in June 2024.

Table 29 GND2226 groundwater sampling results for the 2023/24 monitoring period

| Parameter | August 2023 | November 2023 | February 2024 | May 2024 | June 2024 |
|---|---|---|---|---|---|
| Level (m) | 4.4 | 6.02 | 6.15 | 7.03 | 7 |
| Temp (°C) | 14.1 | 18.3 | 16.9 | 13.4 | 14.2 |
| Chloride (g/m$^3$) | 156 | 151 | 158 | 164 | 163 |
| Electrical Conductivity (mS/m) | 113.8 | 116.6 | 118.6 | 121.6 | 120.8 |
| *E. coli* (MPN/100 mL) | < 1 | < 1 | < 1 | < 1 | 2 |
| Nitrate-N + Nitrite-N (g/m$^3$) | 68 | 72 | 73 | 67 | 76 |
| pH | 6.9 | 6.3 | 6.3 | 6.3 | 6.4 |
| Total Ammoniacal-N (g/m$^3$) | <0.010 | <0.010 | <0.010 | <0.010 | < 0.10 |

### 2.4.5 Solid waste burial

The burial of dead stock is authorised under Consent 5495-1. This consent allows for the discharge of up to 200 tonnes per day of wastes from meat and rendering operations by burial into land in the vicinity of the Inaha Stream. The consent provides a contingency in the event of a significant disruption to the rendering process when dead stock cannot be processed.

In February 2023 Cyclone Gabrielle impacted the North Island causing widespread damage to Hawkes Bay, including to a rendering plant. A significant quantity of stock which could not be processed at these facilities was sent to the Company. As the Company site was not fully operational a large quantity of stock was disposed of in the burial pits instead of being processed. In addition, the construction of a new carpark adjacent to Kohiti Road uncovered an historic burial area which contained highly degraded animal remains. This material was excavated and disposed of in the burial pits. By March 2023 both rendering plants were

operational and no more surplus stock was disposed of in the burial pits, and by November 2023 all burial had stopped and the area had been contoured and was in pasture. There has not been any further burial since then. The burial area is contoured and grassed to minimise surface water infiltration into the pits, and slumped areas have to be filled periodically.

In order to monitor the impacts on ground and surface water a network of groundwater wells (Figure 14) is sampled quarterly. The results for each well can be found in Table 30 to Table 33 below. The consent requires a minimum of eight monitoring bores, however, by the end of the monitoring year there were only three operational bores, the remainder have been abandoned, damaged or buried during earthworks.


Figure 12 Locations of the burial area groundwater monitoring bores

Table 30 Burial pit monitoring well GND1066 groundwater sampling results for 2023/24

| GND1066 | Unit/Date | September 2023 | November 2023 | February 2024 | April 2024 |
|---|---|---|---|---|---|
| Temp | °C | 17.6 | 17.8 | 18.6 | 17.2 |
| Chemical Oxygen Demand (COD) | g $O_2/m^3$ | 34 | 38 | 37 | 33 |
| Electrical Conductivity | mS/m | 332 | 323 | 351 | 353 |
| Nitrate-N + Nitrite-N | $g/m^3$ | 19 | 23 | 8 | 4 |
| pH | pH Units | 7.9 | 7.4 | 7.1 | 7.3 |
| Total Ammoniacal-N | $g/m^3$ | 230 | 220 | 250 | 250 |

Table 31 Burial pit monitoring well GND1067 groundwater sampling results for 2023/24

| GND1067 | Unit/Date | September 2023 | November 2023 | February 2024 | April 2024 |
|---|---|---|---|---|---|
| Temp | °C | 15.2 | 18.1 | - | - |
| Chemical Oxygen Demand (COD) | g $O_2/m^3$ | 22 | 24 | - | - |
| Electrical Conductivity | mS/m | 83.0 | 99.8 | - | - |
| Nitrate-N + Nitrite-N | $g/m^3$ | 1.04 | 1.09 | - | - |
| pH | pH Units | 7.2 | 7.0 | - | - |
| Total Ammoniacal-N | $g/m^3$ | 0.67 | 0.058 | - | - |

* Bore was dry in February and had collapsed by April

Table 32 Burial pit monitoring well GND1069 groundwater sampling results for 2023/24

| GND1069 | Unit/Date | September 2023 | November 2023 | February 2024 | April 2024 |
|---|---|---|---|---|---|
| Level | m | - | 5.46 | 5.64 | 4.77 |
| Temp | °C | 14.2 | 17.6 | 18.1 | 16.5 |
| Chemical Oxygen Demand (COD) | g $O_2/m^3$ | 42 | 52 | 46 | 122 |
| Electrical Conductivity | mS/m | 267 | 269 | 280 | 279 |
| Nitrate-N + Nitrite-N | $g/m^3$ | 0.6 | 0.109 | 0.22 | < 0.02 |
| pH | pH Units | 7.9 | 7.5 | 7.4 | 7.6 |
| Total Ammoniacal-N | $g/m^3$ | 240 | 240 | 240 | 240 |

Table 33 Burial pit monitoring well GND2506 groundwater sampling results for 2023/24

| GND2506 | Unit/Date | September 2023 | November 2023 | February 2024 | April 2024 |
|---|---|---|---|---|---|
| Temp | °C | 15.5 | 16.3 | 16.6 | 15.1 |
| Chemical Oxygen Demand (COD) | g $O_2/m^3$ | 12 | 8 | 11 | <6 |
| Electrical Conductivity | mS/m | 135.7 | 133.0 | 158.8 | 143.7 |
| Nitrate-N + Nitrite-N | $g/m^3$ | 0.009 | 0.004 | 0.019 | 0.002 |
| pH | pH Units | 6.8 | 7.0 | 6.6 | 7.1 |
| Total Ammoniacal-N | $g/m^3$ | 4.0 | 3.6 | 4.0 | 2.2 |

The concentration of contaminants in the groundwater monitoring bores varies significantly between bores and between surveys. The variation in results is likely due to differing rates of decay of the buried organic material in different areas of the burial area.

The highest NNN concentrations occurred in the first two surveys from GND1066 and were 19 and 23$g/m^3$. The following surveys reported a significant reduction in NNN with results of 8 and 4$g/m^3$. The results from the remaining groundwater wells ranged between 0.002 and 1.44$g/m^3$ (GND1067, September 2023) over the same period.

Two of the bores reported very high concentrations of ammoniacal nitrogen from all survey results. GND1066 is located closest to the Inaha Stream and the concentrations ranged between 220 and 250$g/m^3$. Samples from the monitoring bore GND1069, approximately in the middle of the consented burial area, all contained 240$g/m^3$ of ammoniacal nitrogen. For comparison the remaining monitoring bores contained concentrations of between 0.058 and 4.0$g/m^3$. Further, the COD results from GND1066 and GND1069 were higher overall than results from the other bores. The nitrogen and COD results are spatially and temporally variable which is likely a result of sporadic burials and the effects of complex chemical and biological processes on these contaminants. In groundwater these contaminants do not have any significant effect, however given the proximity of the burial area to the Inaha Stream these contaminants pose a risk to stream health by migration through the soil.

### 2.4.5.1 Effects on receiving environment

The effect on the Inaha Stream quality of diffuse discharges from the burial area can be measured by comparing data from the downstream monitoring location with that from the upstream site. The contaminants of concern in the discharge are NNN and ammoniacal nitrogen.

As shown in Figure 15 the NNN concentrations in upstream (black line) and downstream (red line) locations follows the same trend over the last five years. Downstream concentrations have always been higher than upstream, indicating that discharges from the burial area are contributing to NNN in the stream, however the difference is marginal. Assuming all NNN is nitrate, the concentrations are all substantially lower than the DWSNZ MAV for nitrate of 50g/m$^3$.

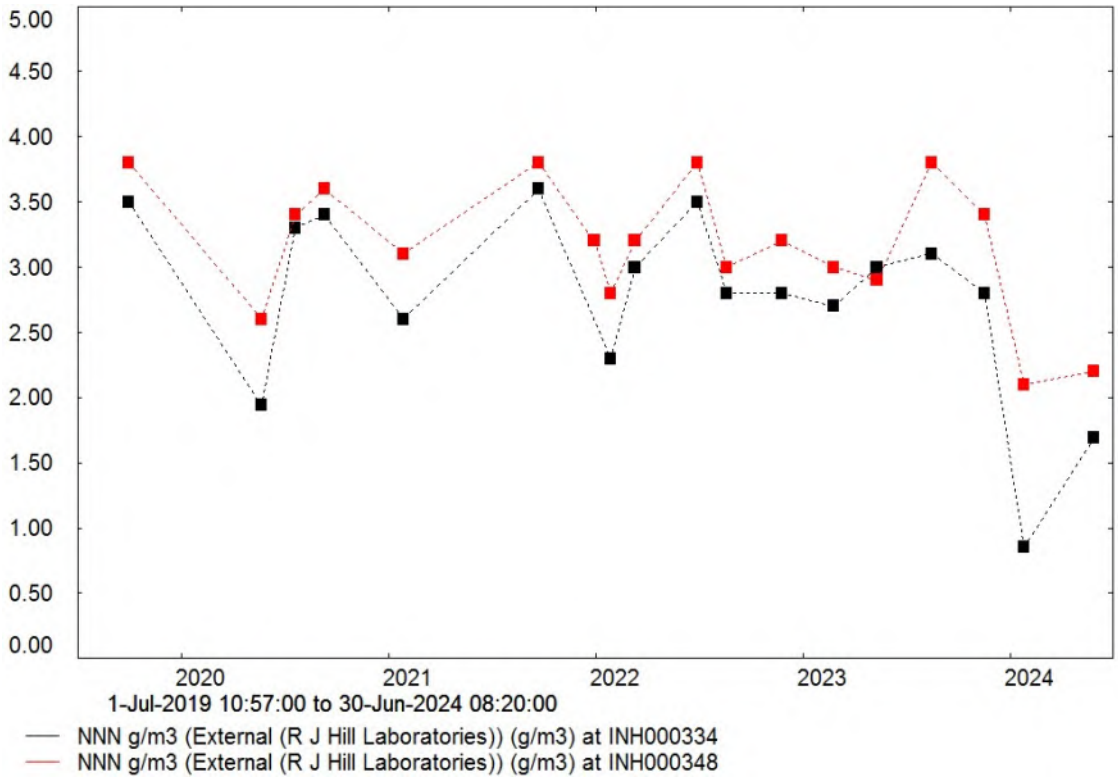


Figure 13 Comparison of upstream and downstream NNN concentration in the Inaha Stream, 2019-2024

Similarly, upstream and downstream ammoniacal nitrogen concentrations in the Inaha Stream show a similar trend over a five-year period (Figure 16). There was one exception in August 2023 when the downstream concentration of ammoniacal nitrogen was an order of magnitude higher than the upstream concentration.

Ammoniacal nitrogen is an attribute listed in the NPS:FM and sets target attribute bands and a national bottom line. Based on INH000348 results during the 2023/24 monitoring the section of the stream adjacent to the burial area achieved a 95$^{th}$ percentile concentration of 0.2g/m$^3$ which falls in the 'B' attribute band. Water quality in this attribute band provides protection for 95% of aquatic species, although more sensitive species may be adversely impacted.

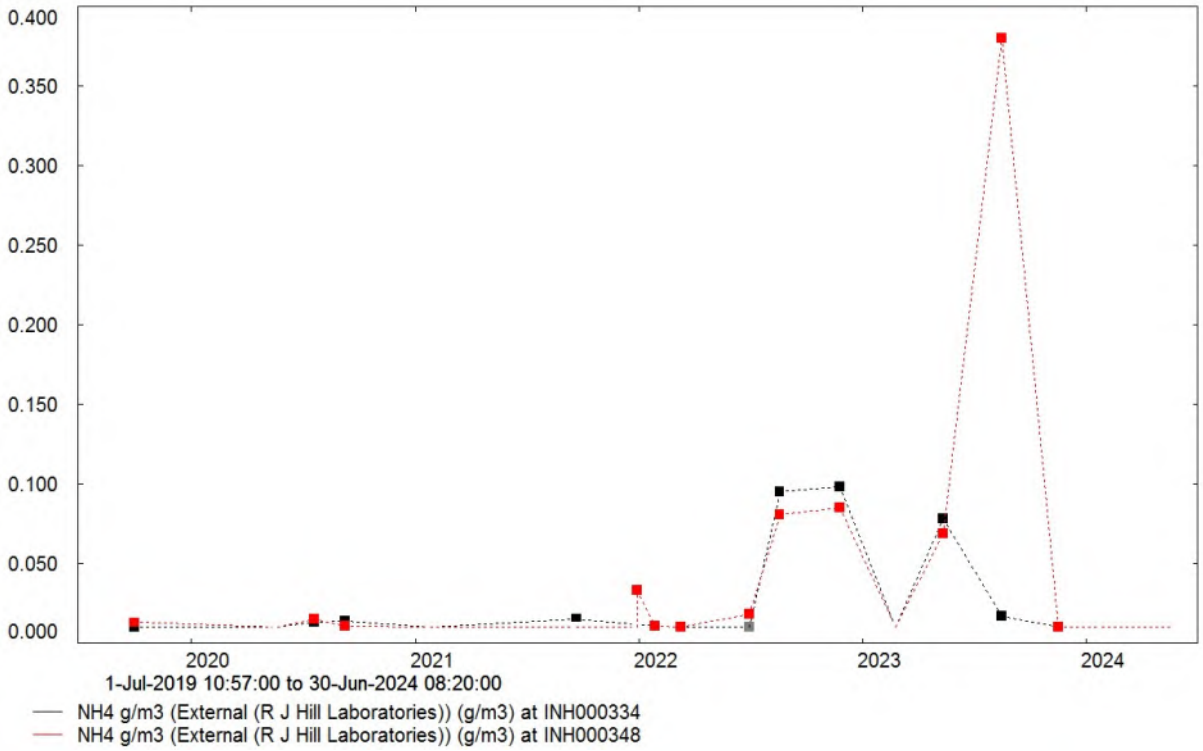


Figure 14 Comparison of upstream and downstream ammoniacal nitrogen concentration in the Inaha Stream, 2019-2024

### 2.4.6 Biomonitoring

Biological surveys were conducted on 8 November 2023 and 19 March 2024. At each survey a combination of the 'vegetation sweep' and 'kick-sampling' techniques was used at eight sites to collect streambed macroinvertebrates from the Inaha Stream and tributary. This was to assess whether discharges (via point source and irrigation to land) from the Company's rendering plant had any adverse effects on the macroinvertebrate communities in the streams. Samples were processed to provide number of taxa (richness), MCI and SQMCI scores for each site. The locations of the biomonitoring sites are shown in Figure 4

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.

#### 2.4.6.1 Biomonitoring survey, November 2023

The last discharge from Pond 6 was on 20 October, 19 days before this survey was conducted. Taxa richness in the Inaha Stream ranged between 10 and 16 taxa. All five sites recorded a taxa richness lower than their respective site medians. MCI scores categorised all sites as having 'good' macroinvertebrate community health. There was a significant increase in MCI scores between site 2d, immediately below the discharges, and the two lower sites 3 and 4. SQMCI scores ranged from 'very good' to 'fair' macroinvertebrate community health. Many of the sites recorded SQMCI scores similar to each other, however site 1 recorded significantly less than the remaining four sites. There were no other significant differences in SQMCI scores between sites.

Taxa richness in the unnamed tributary of the Inaha Stream ranged between 13 and 20 taxa. MCI scores categorised site UT as having 'good' macroinvertebrate community health, while sites MT and DT had 'fair'

health. Site MT recorded an MCI score significantly less than site UT. SQMCI scores ranged from 'very good' to 'fair' health. There was a significant progressive decline in SQMCI scores across these sites in a downstream direction.

No heterotrophic growths were identified in this survey.

Results of this biomonitoring survey suggest that discharges from Taranaki By-Products had not significantly affected the freshwater macroinvertebrate communities present in the Inaha Stream or tributary of the Inaha Stream. Significant declines of scores in the tributary of the Inaha Stream could be attributed to habitat differences at the time of sampling, making it difficult to determine the extent to which the tributary is affected by the extended irrigation zone.

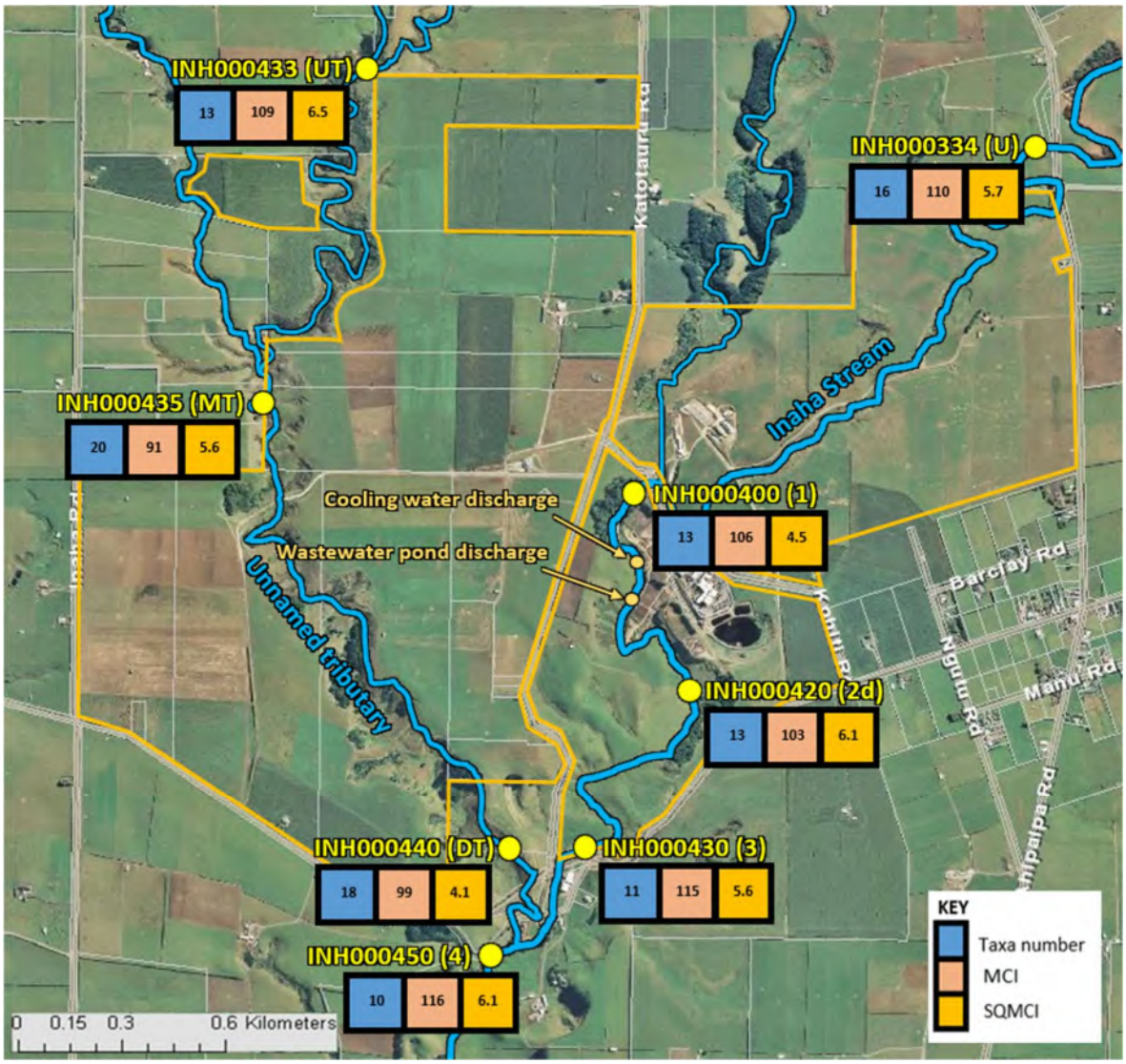


Figure 15 Location and scores of biomonitoring sites in the Inaha Stream and the unnamed tributary of the Inaha Stream. Irrigation area shown by orange line

### 2.4.6.2 Biomonitoring survey, March 2024

Taxa richness in the Inaha Stream ranged between 15 and 21 taxa. All sites recorded a taxa richness higher than that previously recorded, however, all sites recorded less than their respective historical medians. The MCI scores recorded in this survey ranged from 98 units to 109 units, reflective of 'fair' to 'good' health. There was an increase of MCI scores in a downstream direction, with the most downstream site 4 recording

significantly higher than the most upstream site U. SQMCI scores ranged from 4.4 units to 5.9 units, reflective of 'fair' to 'good' health. Site 1 recorded significantly less than the remaining four sites.

Taxa richness in the unnamed tributary of the Inaha Stream ranged between 10 and 21 taxa. MCI scores ranged between 75 units and 106 units, reflective of 'good' to 'poor' health. Sites MT and DT recorded MCI scores significantly less than the 'control' site UT. It is possible that irrigation leaching is affecting the tributary of the Inaha Stream, however poor habitat characteristics makes it difficult to compare. SQMCI scores ranged between 2.8 units and 4.7 units, reflective of 'fair' to 'very poor' health. Site DT recorded significantly less than both upstream sites.

No heterotrophic growths were identified in this survey.

Results of this biomonitoring survey suggest that discharges from Taranaki By-Products have not significantly affected the freshwater macroinvertebrate communities present in the Inaha Stream or tributary. Significant declines of scores in the tributary could be attributed to both poor habitat characteristics at the time of sampling and the extended irrigation zone; however, it is difficult to understand the extent to which the tributary is being affected by the irrigation.

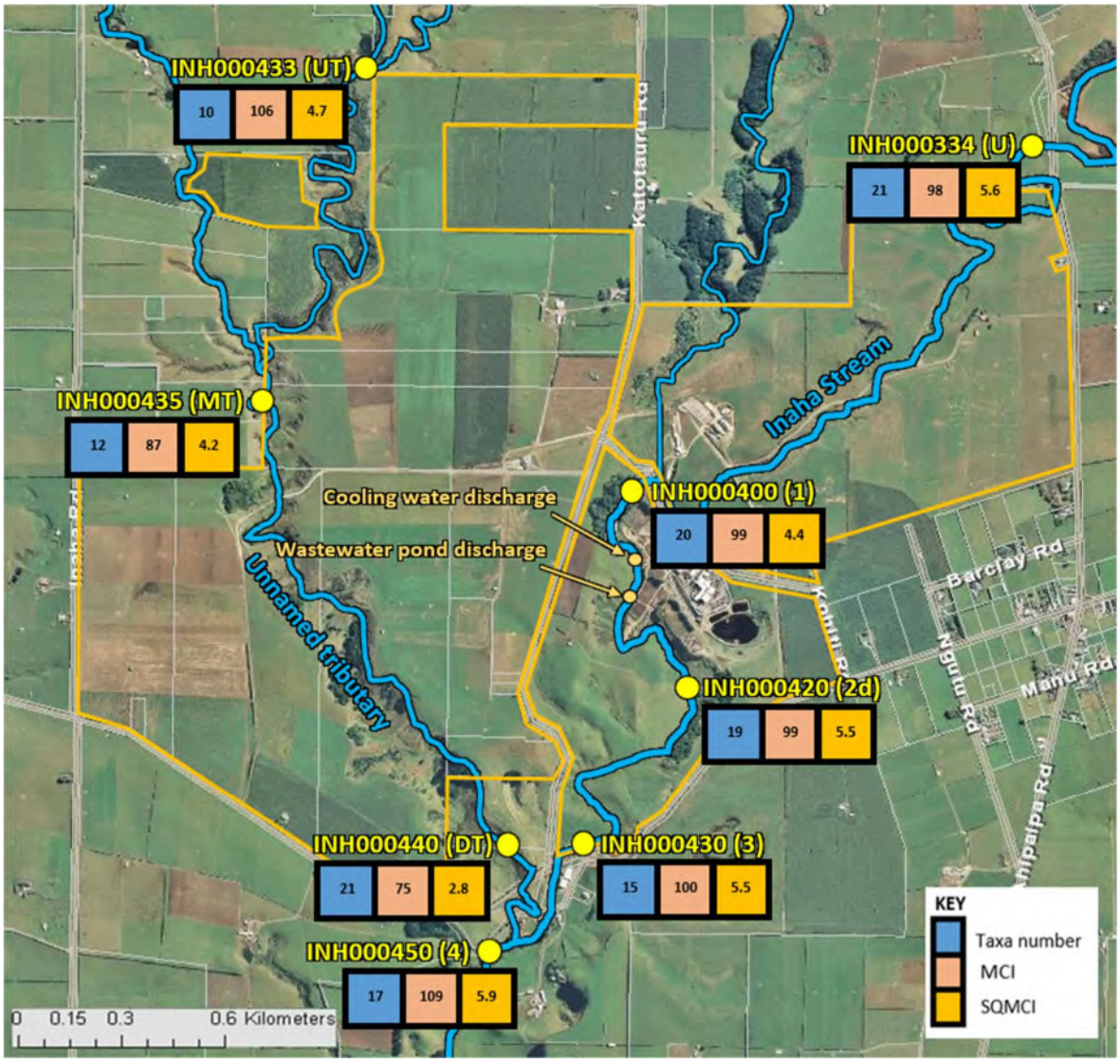


Figure 16 Location and scores of biomonitoring sites in the Inaha Stream and the unnamed tributary of the Inaha Stream. Irrigation area shown by orange line

## 2.5 Incidents, investigations and interventions

In the 2023/24 monitoring period, the Council received one complaint about odour from the plant (IN/49175). The complaint was received on 27 March 2024 at 7:15am advising that an odour had been apparent during the previous night and was, at times, likened to an effluent pond odour or dead animal odour. A compliance monitoring officer arrived on site at 9:08am and conducted odour assessments at nine locations over a period of three hours. The officer reported odour from three of these locations and described it as very weak. The wind was described as gusty during the assessment which likely helped disperse the odour somewhat. The officer determined that the odour was not offensive and therefore complied with air discharge Consent 4058-4.

## 2.6 Reports, management plans and certifications

The Company is required to prepare, review and submit six management plans relating to discharges of odour, wastewater, irrigation wastewater, solid waste and stormwater contingency measures. The frequencies for reviewing and submitting these reports are annual, two-yearly, or on request. Management plans are limited to non-critical operational processes that lie behind achieving a performance or operational standard. For example, a plan must include procedures and measures to be taken to demonstrate how discharges will comply with limits in a consent condition. Table 34 lists the management plans which must be maintained, the review frequency and the compliance status for this monitoring year.

Table 34 Management plans required by consent conditions

| Requirement | Consent Number (and Condition Numbers) | Dates(s) required | Compliance achieved |
|---|---|---|---|
| **Emissions to air** | | | |
| Certification that works, processes and equipment are operated according to good engineering practice | 4058-4 (6) | Biennially from 30 April 2013 | Yes. Last audit report dated 17 August 2023 |
| Air discharge management plan | 4058-4 (7)(9) | 2 February 2012, annual review by 31 May, including contingency procedures | Yes. Initial plan received 25 March 2024. |
| Monthly report under section 3.2 of management plan on daily activities log, weather, bio-filter performance | 4058-4 (7) | Monthly | Yes. Monthly reports received. |
| **Wastewater to Inaha Stream** | | | |
| Wastewater disposal management plan | 2049-4 (13)(15) | Annual review from 31 May 2007 | Yes. Last report dated 24 May 2024 |
| Monthly report under section 5.2 of management plan on wastewater characteristics, flows and irrigated areas | 2049-4 (13)(15) | Monthly | Yes. Reports received monthly |
| **Wastewater to land** | | | |
| Spray irrigation management plan | 3941-2 (1)(3) | Annual review from 31 May 2006 | Yes. Last report dated 24 May 2024 |
| Annual report under section 4.3 of management plan on wastewater characteristics, flows and irrigated areas | 3941-2 (1)(3) | Annually | Yes |

| Requirement | Consent Number (and Condition Numbers) | Dates(s) required | Compliance achieved |
|---|---|---|---|
| **Burial pits** | | | |
| (Solid) Waste burial management plan | 5495-1 (1)(3) | Subject to review on two months' notice | Yes. Review received 2 May 2014 |
| **Stormwater to Inaha Stream** | | | |
| Contingency plan for spillage or accidental discharge | 5426-1 (4) | 31 August 1999 | Yes. Last review received 28 May 2014 |

### 2.6.1 Community Liaison Group

The Community Liaison Group Meeting (CLG) met twice this year. The general view of the community was that the air quality in the area was an improvement on the previous year which had been described as the worst for many years. The improvement is largely due to the completion of burial of dead stock, the completion of external cladding on the building, and the upgrade of the biofilters. The Company expressed appreciation to the CLG, for their patience during this time and confidence that the ongoing improvements and upgrades will further reduce odour effects.

# 3. Discussion

## 3.1 Site and environmental performance

### 3.1.1 Water takes

The abstraction of water from both groundwater and the Inaha Stream was undertaken in full accordance with the conditions of the relevant resource consents. In complying with the abstraction limits set out in the consents the water flows, quantities and levels are maintained in a manner which safeguards the life-supporting capacity of the water and protects instream uses and values of the Inaha Stream and its tributaries.

### 3.1.2 Discharges to water

The wastewater treatment system was generally well managed during the 2023/24 monitoring year. Treated wastewater was discharged to the Inaha Stream for 73 days, fewer than the previous two monitoring years when the number of days was 93 and 121 respectively. A comparison of water quality sample results collected from upstream and downstream of the discharge show that the discharge from pond 6 had a negligible impact on water quality after the mixing zone. Parameters including *E. coli* and biochemical oxygen demand were largely unaffected by the discharge, but ammoniacal nitrogen increased by 67% between the upstream and downstream sample locations. Ammoniacal nitrogen concentrations at other locations throughout the rest of the catchment at the time were relatively high, likely due to preceding rainfall flushing contaminants from multiple sources. Overall, the results indicate that the wastewater treatment system significantly reduces contaminant loading in the wastewater prior to discharge such that effects on the Inaha Stream are minimised.

The effect of the Pond 6 discharge is further evidenced by the relatively low ammoniacal nitrogen results when there is no discharge occurring. There is an absence of a trend in *E. coli* results during the year and between monitoring locations which indicates that the Pond 6 discharge is not a significant source, instead, there are other sources or in-stream process which are contributing variable concentrations the length of the Inaha. The only identifiable trend is that *E. coli* (and by inference pathogens) are more abundant during Summer when warm weather creates conditions more conducive to reproduction.

The TSSs concentration in the stormwater treatment sump was higher than the consent limit for the discharge on three occasions this monitoring year. These do not represent exceedances of the consent condition but indicate that an inspection of the system should be conducted, and any remedial actions undertaken to minimise adverse effects from the discharge of TSSs into the Inaha Stream. The concentrations of TSSs at the outlet of the Firewater Pond were less than the guideline value recommended by the Council which indicates that solids are settling out of suspension before discharging into the Inaha Stream.

Monitoring of the biological community in the Inaha Stream and Western Tributary concluded that the macroinvertebrate health of monitored sites ranged from poor to good during both surveys. The cumulative discharges from Pond 6 and wastewater irrigation did not adversely affect the macroinvertebrate community this monitoring year, although there was some uncertainty because of the variability of stream habitat which is another stressor on the health and abundance of the macroinvertebrate community.

### 3.1.3 Discharges to land

The volume of wastewater and dairy effluent irrigated to the paddocks decreased this monitoring year. The results of groundwater monitoring showed that contaminants and parameters such as NNN, ammoniacal nitrogen, chloride and *E. coli* were stable and comparable to previous years. Overall, this indicates that

constituents of the wastewater are being readily assimilated into the soil. Less wastewater was irrigated to land this year, and over a greater irrigation area resulting in a lower overall nitrogen loading rate than two of the last three years.

The results of this year's monitoring of the Northern Tributary were within the respective long-term ranges indicating that wastewater irrigation in this area was managed consistently this monitoring year. However, the results also show that nitrogen and *E. coli* was impacting the water quality in these tributaries. The water quality in both tributaries is rated below the National Bottom Line for *E. coli* and in attribute band B for ammoniacal nitrogen.

The concentrations of nitrate observed in the Western Tributary are at levels at which toxic effects on aquatic fauna may occur. Both tributaries are displaying impacts of farm activities, including wastewater irrigation, but overall are not being degraded further. This is supported by the biomonitoring report which found only small changes in the macroinvertebrate community at all monitoring sites

The disposal of waste product into the burial pits has largely ended due to increased capacity in the North Island rendering plants and also due to the consented burial area reaching full capacity. Results of samples collected from monitoring bores around the burial pit area show high spatial and temporal variability of NNN and ammoniacal nitrogen in groundwater. The results demonstrate that decomposing material is impacting groundwater. Given the small area of the burial pit the effects of contamination are likely to be localised and migrating toward the Inaha Stream. There are no potable water bores in the immediate area and there are not likely to be any adverse effects on human health. The results of samples collected from upstream and downstream of the burial pits indicate that discharges are not having a significant effect on NNN and ammoniacal nitrogen levels in the Inaha Stream. Biological and physiochemical process occurring in the soil are likely attenuating the contaminants so that once groundwater reaches the stream, they are not significant.

### 3.1.4 Discharges to air

The most likely sources of odour from the site are fugitive odours from the processing building and exposed burial pits, the wastewater storage Ponds and to a lesser extent application of wastewater to land. The character of the odour from these the Company activities can be categorised as extremely unpleasant and accordingly the odour may only need to be weak or distinct to cause a significant nuisance effect if experienced by residents living nearby. This is evidenced by the extent of historical complaints about the site before significant improvements were made to both the emissions control systems and management measures several years ago.

There was one odour complaint this monitoring year, a significant decrease compared to previous years. The officer who attended deemed that the odour at the time was not offensive or objectionable.

Upgrades to the cladding of the processing building, the ducting of the emissions control system, and the biofilter beds are likely the primary reason for a reduction in odour effects from plant processes. The emissions control system relies on negative pressure to extract odour to the biofilters for treatment and prevent fugitive odour from 'leaking' out of the building. Biofilters are usually very effective at removing odour from an air stream. Additionally, the burial of unusable material has declined significantly due to the increased processing capacity of the rendering plant and others in the North Island. The burial area is now at maximum capacity and there are not likely to be any burials unless a new consent is issued for this activity.

## 3.2 Evaluation of performance

A summary of the consent holder's compliance record for the year under review is set out in Table 35 to Table 44.

Table 35 Summary of performance for Consent 2049-4.

| Purpose: To discharge treated wastewater from a rendering operation and from a farm dairy into the Inaha Stream (2049-4) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 1. Mixing zone 30m downstream of discharge | Site inspection and monitoring results | Yes |
| 2. Boundaries of mixing zone to be determined by Council | Site inspection | Yes |
| 3. Point of discharge to enter channel directly to ensure mixing | Site inspection | Yes |
| 4. Advise Council before making changes to alter nature of discharge | Site inspection, monitoring results and liaison | Yes |
| 5. the Company to undertake self-monitoring | Review of monthly monitoring of effluent for nitrogen. Some monitoring in management plan undertaken by Council | Yes |
| 6. Minimum discharge dilution rate | Monitoring results | Yes |
| 7. No discharge of stickwater, and consult with Council before increasing cow herd | Site inspection | Yes |
| 8. Discharge to cease when flows in the Inaha Stream drops below 100L/s | Monitoring of Kohiti Road flow gauge results | Yes |
| 9. Control on effect of discharge in receiving water | Inspection, chemical sampling and biomonitoring | Yes |
| 10. Limits on receiving water ammonia concentration | Chemical sampling | Yes |
| 11. Recording and reporting of discharge rate | Inspection and review of records | Yes |
| 12. Inaha Stream flow measurement device | Inspection, gaugings by Council | Yes |
| 13. Maintain a wastewater disposal plan | Submission of plan to Council | Yes |
| 14. Plan to be implemented | Inspections and liaison and receipt of the Company reports | Yes |
| 15. Optional and annual reviews of wastewater plan | Submission of plan to Council | No |
| 16. Designated staff member | Site inspection | Yes |
| 17. Training of staff on wastewater disposal | Liaison and inspection | Yes |
| 18. Donation to Taranaki Tree Trust | Confirmation with Council finance department that donation received | Yes |
| 19. Optional review provision | Application for replacement consent lodged 2018. S.124 protection | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent<br>Overall assessment of administrative performance in respect of this consent | | **High**<br>**High** |

N/A = not applicable

Table 36 Summary of performance for Consent 2050-4

| Purpose: To discharge cooling water to Inaha tributary (2050-4) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 1. Activity monitoring by the Company as required | Continuous temperature monitoring | Yes |
| 2. Composition not to be different to Inaha Stream, other than heat and solids | Chemical sampling by Council | Yes |

| Purpose: To discharge cooling water to Inaha tributary (2050-4) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 3. Maximum temperature limit on discharge | Continuous temperature recording by Council | Yes |
| 4. Limit on suspended solids in discharge | Sampling by Council | Yes |
| 5. Controls on effect of discharge in receiving water | Continuous temperature monitoring, and chemical and biological sampling, by Council | Yes |
| 6. Discharge temperature measurement and recording | Monitoring carried out by Council | Yes |
| 7. Optional review provision | Application for replacement consent lodged 2018. S.124 protection | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent<br>Overall assessment of administrative performance in respect of this consent | | **High**<br>**High** |

N/A = not applicable

Table 37 Summary of performance for Consent 2051-4.1

| Purpose: To take water from the Inaha Stream for a rendering operation (2051-4.1) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 1. Means of take satisfactory to Council | Inspection and monitoring | Yes |
| 2. Minimum flow of 25L/s downstream of point of abstraction | Monitoring of flow | Yes |
| 3. Operation of an abstraction measurement device, maintain records of the dates and daily quantities of water abstracted | Review of data | Yes |
| 4. Record daily flow of Inaha Stream | Daily level record and monthly report by the Company | Yes |
| 5. Provision for review | Application for replacement consent lodged 2018. S.124 protection | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent<br>Overall assessment of administrative performance in respect of this consent | | **High**<br>**High** |

N/A = not applicable

Table 38 Summary of performance for Consent 5426-1

| Purpose: To discharge stormwater to Inaha tributary (5426-1) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 1. Notification prior to changing processes that may significantly alter discharge | Inspection by Council | Yes |
| 2. Limits on discharge composition | Chemical sampling of stormwater by Council | Yes |
| 3. Controls on effect of discharge in receiving water | Chemical and biological sampling by Council | Yes |
| 4. Provision of spillage contingency plan by 31 August 1999 | Plan produced in November 2000 | Yes |
| 5. Optional review provision | Application for replacement consent lodged 2018. S.124 protection | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent<br>Overall assessment of administrative performance in respect of this consent | | **High**<br>**High** |

N/A = not applicable

Table 39 Summary of performance for Consent 4058-4

| Purpose: To discharge emissions to air (4058-4) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 1. Adopt best practicable option to prevent or minimise adverse effects | Liaison with the Company and inspection by Council. | Yes |
| 2. No offensive or objectionable odour beyond boundary | Odour surveys undertaken by Council during inspections and by the Company | Yes |
| 3. Definition of noxious, offensive or objectionable odour | | N/A |
| 4. Designated staff member for emissions management | Part of the Company Environmental Manager's job description. Also Plant and Operations Manager's responsibility | Yes |
| 5. Prohibition of fish rendering | Inspection by Council | Yes |
| 6. Certification processes and equipment operated according to good engineering practice biennially from 30 April 2013 | Biennial certification by suitably qualified independent person. | Yes |
| 7. Preparation of Air Discharge Management Plan | Submission of Plan | Yes |
| 8. Operation in accordance with Air Discharge Management Plan | Inspection by Council | Yes |
| 9. Annual review of Air Discharge Management Plan by 31 May | Liaison. | Yes |
| 10. Limits on dust deposition rate | Not monitored. No complaints. | Yes |
| 11. Community liaison meetings | Two meetings held. | Yes |
| 12. Optional review provision to deal with significant adverse effects | Review | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent<br><br>Overall assessment of administrative performance in respect of this consent | | **High**<br>**High** |

N/A = not applicable

Table 40 Summary of performance for Consent 3941-2

| Purpose: To discharge treated wastewater to land (3941-2) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 1. Irrigation to defined area | Inspection by Council | Yes |
| 2. Provision and maintenance of spray irrigation management plan | Submission of plan to Council | Yes |
| 3. Plan to be followed | Liaison, inspection and provision of monitoring reports | Yes |
| 4. Optional, and mandatory annual reviews of management plan | Not exercised | Yes |
| 5. Designated staff member | Part of the Company Environmental Manager's job description. Also Plant and Operations Manager's responsibility | Yes |
| 6. Adopt best practicable option to minimise adverse effects, including total nitrogen minimisation | Liaison and inspection | Yes |

| Purpose: To discharge treated wastewater to land (3941-2) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 7. Seek permission for Inaha Stream discharge when cannot irrigate, and Inaha Stream in low flow | Liaison and inspection. Not required this period | N/A |
| 8. Limit on dissolved oxygen in final pond | Sampling | No |
| 9. No offensive or objectionable odour beyond boundary | Inspection and complaint register | Yes |
| 10. No spray drift beyond boundary | Inspection and complaint register | Yes |
| 11. Limit on sodium absorption ratio | Sampling | Yes |
| 12. Prohibition of ponding and run-off | Inspection and complaint register | Yes |
| 13. Spray buffer zones | Inspection and complaint register | Yes |
| 14. Limit on nitrogen application rate | Monitoring by the Company and review of irrigation records. Record of fertiliser application kept to establish total nitrogen loading | Yes |
| 15. Report on reducing ammonia concentration by 15 December 2000 | Report received by Council on 2 April 2001 | Yes |
| 16. Limit on application rate | Inspection and provision of records | Yes |
| 17. Limit on return period | Inspection and provision of records | Yes |
| 18. Installation and maintenance of monitoring bores | Liaison and inspection. | Yes |
| 19. Baseline and operational monitoring by the Company | Results of wastewater, irrigation and soil monitoring by/for the Company reviewed by Council | Yes |
| 20. Consultation meetings with interested parties | Ongoing consultation through consent renewal | Yes |
| 21. Council and Ngāti Manuhiakai Hapū to be advised of discharge to Inaha Stream under consent 2049 | Ongoing consultation | Yes |
| 22. Provisions for contamination of groundwater or water supply | Monitoring and sampling of groundwater | Yes |
| 23. Optional review provision for operational requirements | Not exercised | N/A |
| 24. Optional review provision upon receipt of ammonia reduction report | Not exercised | N/A |
| 25. Optional review provision for nitrogen treatment and disposal | Not exercised | Yes |
| 26. Optional review provision for environmental effects | Not exercised | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent<br>Overall assessment of administrative performance in respect of this consent | | **Good**<br>**High** |

N/A = not applicable

Table 41 Summary of performance for Consent 5495-1

| Purpose: To discharge wastes from meat rendering by burial (5495-1) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 1. Provision of waste burial management plan by 1 November 2000 | Plan received by Council and approved in October 2000 | Yes |
| 2. Waste burial management plan to be followed | Inspection by Council, and review of the Company records. | Yes |

| Purpose: To discharge wastes from meat rendering by burial (5495-1) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 3. Optional provision for review of waste burial management plan | Not sought by the Company or Council. Will be reviewed for the consent replacement. | N/A |
| 4. Designated staff member | Environmental Manager and Plant and Operations Manager | Yes |
| 5. Disposal pits not to intercept groundwater | Inspection by Council | Yes |
| 6. Disposal pits to be constructed as prescribed in consent application | Inspection by Council | Yes |
| 7. Notification of commencement of pit construction outside nominated area | Inspection by Council | Yes |
| 8. All constructed disposal pits to be inspected by Council prior to use | Inspection by Council | Yes |
| 9. Conditions 1-4 to apply to new disposal pits | Inspection by Council | Yes |
| 10. Discharged material to be covered within 4 hours | Controlled by consent holder | Yes |
| 11. Soil cover requirements upon completion of each disposal operation | Controlled by consent holder | Yes |
| 12. Cover material and surrounding land to be contoured to direct stormwater away | Inspection by Council | Yes |
| 13. Site rehabilitation and pasture re- establishment | Inspection by Council | Yes |
| 14. No irrigation of effluent onto disposal area | Controlled by consent holder | Yes |
| 15. No direct discharge of contaminants to surface water | Inspection and chemical/biological survey by Council | Yes |
| 16. Installation of monitoring bores | Inspection and sampling by Council. | No |
| 17. Optional review provision for operational requirements | Not sought by the Company | N/A |
| 18. Optional review provision for environmental effects | Will be reviewed for consent replacement. | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent<br><br>Overall assessment of administrative performance in respect of this consent | | **High**<br>**Good** |

N/A = not applicable

Table 42 Summary of performance for Consent 6431-1

| Purpose: To place culverts in Inaha Stream (6431-1) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 1. Adoption of best practicable option to minimise adverse environmental effects | Liaison, and inspection by Council | Yes |
| 2. Consent to be exercised in accordance with documentation submitted | Inspection by Council | N/A |
| 3. Notification prior to commencement and upon completion of works | Liaison with Council. No work undertaken | N/A |
| 4. Subsequent works prohibited between May and October, without permission | Inspection by Council. | Yes |
| 5. Adoption of best practicable option to minimise discharges, bed disturbance and water quality effects | Liaison, inspection and biomonitoring by Council | Yes |

| Purpose: To place culverts in Inaha Stream (6431-1) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 6. Minimisation of bed disturbance | Inspection by Council | Yes |
| 7. Structure removal and area reinstatement upon redundancy | Inspection by Council | N/A |
| 8. Fish passage not to be restricted | Inspection by Council | Yes |
| 9. Erection of stock-proof riparian fences on consent holders' property above Kohiti Road | Implementation of riparian plan RMP938 and inspection by Council | Yes |
| 10. Planting of riparian margins within four years from 4 October 2004 | Implementation of riparian plan RMP938 and inspection by Council. | Yes |
| 11. Placement of culvert inverts and headwall protection structures | Inspection by Council | Yes |
| 12. Lapse of consent if not exercised | Consent was exercised | N/A |
| 13. Optional review provision for environmental effects | Not exercised | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent<br>Overall assessment of administrative performance in respect of this consent | | **High**<br>**High** |

N/A = not applicable

Table 43 Summary of performance for Consent 9756-1

| Purpose: To take and use groundwater for industrial water supply (9756-1) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 1. Limit on maximum take | Water measuring and recording required by consent conditions | Yes |
| 2. Labelling of bore | Inspection by Council | Yes |
| 3. Access to bore for manual measurement of water levels | Inspection by Council | Yes |
| 4. Installation of metering and logging equipment | Inspection by Council and certification under condition 5 | Yes |
| 5. Certification of water measuring equipment | Provision of certificate on 29 May 2014 | Yes |
| 6. Installation of water level measuring equipment | Inspection by Council | Yes |
| 7. Telemetry of monitoring data to Council | Inspection by Council | Yes |
| 8. Access to monitoring equipment | Inspection by Council | Yes |
| 9. Notification of equipment failure | Inspection by Council and checking of records | N/A |
| 10. Adoption of best practicable option | Liaison and inspection | Yes |
| 11. Lapse of consent if not exercised | Consent was exercised | N/A |
| 12. Optional review provision for environmental effects | Next review date available is June 2023. | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent<br>Overall assessment of administrative performance in respect of this consent | | **High**<br>**High** |

N/A = not applicable

Table 44 Summary of performance for Consent 10054-1

| Purpose: To discharge emissions into the air from the burning of pallets, paper and cardboard (10054-1) | | |
|---|---|---|
| **Condition requirement** | **Means of monitoring during period under review** | **Compliance achieved?** |
| 1. Adoption of best practicable option to minimise adverse environmental effects | Liaison, and inspection by Council | Yes |
| 2. Restrict on materials combusted | Inspection by Council | Yes |
| 3. Prohibition of objectionable odour | Inspection by Council | Yes |
| 4. Supervision of burning | Inspection by Council | Yes |
| 5. Limit on dust deposition rate | Monitoring by Council as needed | N/A |
| 6. Control of airborne dust components and particulate concentration | Monitoring by Council as needed | Yes |
| 7. Prohibition of toxic components beyond boundary | Monitoring by Council as needed | Yes |
| 8. Lapse of consent if not exercised | Consent was exercised | Yes |
| 9. Optional review provision for environmental effects | Next review date available is June 2023 | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent | | **High** |
| Overall assessment of administrative performance in respect of this consent | | **High** |

N/A = not applicable

Table 45 Evaluation of environmental performance over time

| Year | Consent numbers | High | Good | Improvement req | Poor |
|---|---|---|---|---|---|
| 2019-2020 | 2049-4, 5426-1, 2050-4, 2051-4.1, 9756-1, 3941-2, 5495-1, 4058-4, 10054-1, 6431-1 | | X | | |
| 2020-2021 | 2049-4, 5426-1, 2050-4, 2051-4.1, 9756-1, 3941-2, 5495-1, 4058-4, 10054-1, 6431-1 | | X | | |
| 2021-2022 | 2049-4, 5426-1, 2050-4, 2051-4.1, 9756-1, 3941-2, 5495-1, 4058-4, 10054-1, 6431-1 | | X | | |
| 2022/23 | 2049-4, 5426-1, 2050-4, 2051-4.1, 9756-1, 3941-2, 5495-1, 4058-4, 10054-1, 6431-1 | | | X | |
| 2023/24 | 2049-4, 5426-1, 2050-4, 2051-4.1, 9756-1, 3941-2, 5495-1, 4058-4, 10054-1, 6431-1 | | X | | |

During the year, the Company demonstrated a good level of environmental performance and good level of administrative performance with the resource consents as defined in Appendix II. Minor compliance issues are required with respect to managing DO conditions in Pond 6, and upgrading groundwater bores around the burial pit area to enable monitoring of contaminants, however these did not result in adverse effects.

## 3.3 Recommendations from the 2022/23 Annual Report

In the 2022/23 Annual Report it was recommended:

1. THAT monitoring of consented activities at Taranaki By-Products in the 2023/24 year continue at the same level as in 2022/23.
2. THAT the broken or malfunctioning groundwater bores in the vicinity of the burial pit area must be repaired or replaced to ensure compliance with condition 16 of Consent 5495-1.
3. THAT a one-off programme of groundwater bore inspections should be undertaken to ensure all are fit for purpose.

4. THAT a review of the site management plans should be undertaken following the completion of the building upgrades to ensure the plans are fit for purpose. The review should include, but not be limited to:
    a. The biofilter changes and operating parameters.
    b. Any changes to the wastewater treatment process.
    c. Scheduled inspections and maintenance of the process building and ducting in order to avoid discharges of fugitive emissions, and ensure the building is maintained under negative pressure.
5. THAT closer monitoring of the nitrate and *E. coli* levels in the Northern Tributary should be undertaken, and a review of the management of activities on paddocks adjacent to the tributary should be undertaken as a precautionary measure.

No additional bores have yet been installed in the burial pit area to replace damaged ones, and one further bore became unusable. During this monitoring year all groundwater bores were inspected and most were upgraded with steel barriers added to protect them from damage. All site management plans were reviewed and submitted on time.

## 3.4 Alterations to monitoring programmes for 2024/25

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.

The monitoring programme for the 2024/25 monitoring year will continue at the same scale and frequency as the 2023/24 monitoring year.

The proposed programme represents a reasonable and risk-based level of monitoring for the activities occurring on the site. The Council reserves the right to adjust the programme from that initially prepared should the need arise if potential or actual non-compliance is determined at any time during 2024/25.

# 4. Recommendations

1. THAT in the first instance, monitoring of consented activities at Taranaki By-Products in the 2024/25 year continue at the same level as in 2023/24.
2. THAT should there be issues with environmental or administrative performance in 2024/25, 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:

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. |
| Bund | A wall around a tank to contain its contents in the case of a leak. |
| DCBOD | Dissolved 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 µS/cm. |
| DAF | Dissolved Air Flotation wastewater treatment device. |
| 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. |
| FNU | Formazin nephelometric units, a measure of the turbidity of water |
| $g/m^3$ | 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. |
| $m^2$ | Metres squared. |
| $m^3$ | Cubic metres. |
| MAV | Maximum Acceptable Value. |

| | |
|---|---|
| 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. |
| 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. |
| MPN | Most Probable Number. A method used to estimate the concentration of viable microorganisms in a sample. |
| $mS/m^3$ | Millisiemens per cubic metre |
| µS/cm | Microsiemens per centimetre. |
| $NH_4$ | 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. |
| 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. |
| TSS | Total suspended solids. |
| SQMCI | Semi quantitative macroinvertebrate community index. |
| Temp | Temperature, measured in °C (degrees Celsius). |
| Turb | Turbidity, expressed in NTU or FNU. |

*an abbreviation for a metal or other analyte may be followed by the letters 'As', to denote the amount of metal recoverable in acidic conditions. This is taken as indicating the total amount of metal that might be solubilised under extreme environmental conditions. The abbreviation may alternatively be followed by the letter 'D', denoting the amount of the metal present in dissolved form rather than in particulate or solid form.

For further information on analytical methods, contact a manager within the Environment Quality Department.

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# Appendix I

## Resource consents held by Taranaki By-Products Ltd

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

## 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.

# Discharge Permit

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

| | |
|---|---|
| Name of Consent Holder: | Taranaki By-Products Limited<br>P O Box 172<br>HAWERA |
| Change to Conditions/Review Completed Date: | 4 October 2006 [Granted: 31 May 1999] |

## Conditions of Consent

| | |
|---|---|
| Consent Granted: | To discharge up to 940 cubic metres/day of treated wastewater from a rendering operation and from a farm dairy into the Inaha Stream at or about GR: Q21:118-858 |
| Expiry Date: | 1 June 2019 |
| Review Date(s): | June 2001, June 2003, June 2005, June 2007, June 2011, June 2017 |
| Site Location: | Kohiti Road, Okaiawa |
| Legal Description: | Lots 1 & 2 DP 6457 Blk IV Waimate SD |
| Catchment: | Inaha |

*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**

**Special conditions 1 – 5 (unchanged]**

1. The mixing zone in each condition of this consent shall extend for a distance of 30 metres downstream of the point of discharge of treated wastewater.

2. The boundaries of the mixing zone and site of discharge shall be as physically determined by the Chief Executive, Taranaki Regional Council.

3. The point of discharge into the Inaha Stream shall be such that the discharge enters directly into a channel of the Inaha Stream in order to ensure that complete mixing occurs.

4. The consent holder shall advise the Taranaki Regional Council prior to making any change in the processes undertaken at the site which could significantly alter the nature of the discharge.

5. The consent holder shall undertake such monitoring of the activities licensed by this consent, as deemed reasonably necessary by the Chief Executive, Taranaki Regional Council, subject to section 35(2)(d) and section 36 of the Resource Management Act 1991. This monitoring information is to be forwarded to the Chief Executive, Taranaki Regional Council, upon request.

**Special condition 6 [amended]**

6. A minimum dilution rate of 1:300 shall be maintained at the point of discharge to the Inaha Stream at all times.

**Special condition 7 [replaced]**

7. a) No stick-water shall be discharged under this consent. Stick-water is defined as juices squeezed out of products that are rendered.

   b) This consent allows the discharge of wastewater from up to 1,200 cows. Prior to this number being increased the consent holder must demonstrate, in writing, to the satisfaction of the Chief Executive Officer, Taranaki Regional Council, that the wastewater treatment system can treat the wastewater without breaching condition 9 of this consent.

**Special conditions 8- 12 [unchanged]**

8. The discharge shall cease when flows decrease in the Inaha Stream, as measured at the Kohiti Road gauging site, to below 100 litres/second.

9. The discharge [in conjunction with any other discharges pertaining to the same property], shall not cause or give rise to any of the following effects, at any point in the receiving waters below the mixing zone:

   (a) a fall of more than 0.5 pH units;
   (b) an increase in filtered carbonaceous biochemical oxygen demand [20 degrees Celsius, 5-day test] to above 2.00 $gm^{-3}$;
   (c) a temperature rise of more than 3.0 degrees Celsius;
   (d) a reduction in the dissolved oxygen concentration to below 80% of saturation concentration;
   (e) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   (f) any conspicuous change in the colour or visual clarity;
   (g) any emission of objectionable odour;
   (h) the rendering of fresh water unsuitable for consumption by farm animals;
   (i) any significant adverse effects on aquatic life, habitats or ecology;
   (j) any visible bacterial and/or fungal growths in the receiving water.

10. The discharge, in conjunction with any other discharges pertaining to the same property, shall not raise the total ammonia concentration [expressed as $NH_3$] in the receiving waters at any point below the mixing zone above 1.5 $gm^{-3}$ if the pH of the receiving water is below 7.75, or above 0.7 $gm^{-3}$ if the pH of the receiving water lies between 7.75 and 8.00, or above 0.4 $gm^{-3}$ if the pH of the receiving water is above 8.00.

11. The consent holder shall install a metal control gate on the discharge outlet, and install and operate a v-notch weir and stage board on the outlet, to the satisfaction of the Chief Executive, Taranaki Regional Council; and shall keep records of the discharge rate during the exercise of this consent; such records to be made available to the Chief Executive, Taranaki Regional Council, upon request.

12. The consent holder shall install and maintain a stage board on the Kohiti Road Bridge and shall gauge the site for the purpose of providing a stream flow monitoring site, to the satisfaction of the Chief Executive, Taranaki Regional Council.

**Special condition 13 [amended)**

13. The consent holder shall maintain a wastewater disposal management plan [the management plan] for the wastewater treatment system, to the approval of the Chief Executive, Taranaki Regional Council, outlining the management of the system, particularly the use of the spray irrigation system in combination with the pond discharge, which shall demonstrate the ability to comply with consent conditions and shall address the following matters:

    (a) monitoring of the discharge wastewater;
    (b) monitoring of the receiving water;
    (c) management of the wastewater treatment system;
    (d) minimisation of nutrients in the discharge wastewater;
    (e) treatment and disposal of stickwater;
    (f) mitigation of the effects of the discharge;
    (g) guidelines for use of spray irrigation or discharge to surface water; and
    (h) reporting on the exercise of the consent.

    An objective of the plan shall be to minimise discharges to surface water and to maximise discharges to land under consent 3941.

**Special condition 14 [unchanged]**

14. The consent shall be exercised in accordance with the procedures set out in the wastewater disposal management plan, and the consent holder shall subsequently adhere to and comply with the procedures, requirements, obligations and all other matters specified in the management plan, except by the specific agreement of the Chief Executive, Taranaki Regional Council. In case of any contradiction between the management plan and the conditions of this resource consent, the conditions of this resource consent shall prevail.

**Special condition 15 [amended]**

15. The consent holder shall advise the Taranaki Regional Council two months prior to any changes being made to the wastewater disposal management plan. Should the Taranaki Regional Council wish to review the wastewater disposal management plan, two months notice shall be provided to the consent holder. The consent holder shall review the plan annually and shall provide the reviewed plan to the Chief Executive, Taranaki Regional Council, by 31 May each year.

**Special conditions 16-18 [unchanged]**

16. The consent holder shall designate an officer with the necessary qualifications and/or experience to manage the wastewater treatment system.

17. The consent holder shall ensure that:

    (a) the operation of the wastewater treatment system shall be carried out at all times in accordance with the requirements of the wastewater disposal management plan prepared as required in condition (13) above or subsequent version of that document which does not lessen environmental protection standards;

    (b) all relevant site staff are to be regularly trained on the content and implementation of the wastewater disposal management plan, the maximum period between training sessions being 12 months. New staff are to be trained on recruitment and the training record made available to the Chief Executive, Taranaki Regional Council, upon request; and

    (c) all relevant site staff are advised immediately of any revision or additions to the wastewater disposal management plan.

18. By the agreement of the consent holder, the consent holder shall mitigate the effects of the discharge by donating annually to the Taranaki Tree Trust $2100 [goods and services tax exclusive] for the purpose of providing riparian planting and management in the Inaha Stream catchment. The amount shall be adjusted annually according to the consumer price index, or similar index, to account for the effects of inflation.

**Special condition 19 [amended]**

19. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2007, June 2011, and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this 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 4 October 2006

For and on behalf of
Taranaki Regional Council

_____

**Director-Resource Management**

TRK992050

# DISCHARGE PERMIT

**Pursuant to the RESOURCE MANAGEMENT ACT 1991**
**a resource consent is hereby granted by the**
**Taranaki Regional Council**

| | |
|---|---|
| Name of Consent Holder: | TARANAKI BY-PRODUCTS LIMITED<br>PO BOX 172 HAWERA |
| Renewal Granted Date: | 31 May 1999 |

## CONDITIONS OF CONSENT

| | |
|---|---|
| Consent Granted: | TO DISCHARGE UP TO 2,160 CUBIC METRES/DAY OF COOLING WATER AND BACKWASH WATER FROM A RENDERING OPERATION INTO AN UNNAMED TRIBUTARY OF THE INAHA STREAM AT OR ABOUT GR: Q21:118-858 |
| Expiry Date: | 1 June 2019 |
| Review Date[s]: | June 2001, June 2003, June 2005, June 2011 and June 2017 |
| Site Location: | KOHITI ROAD OKAIAWA |
| Legal Description: | LOTS 1 & 2 DP6457 BLK IV WAIMATE SD |
| Catchment: | INAHA 351.000 |
| Tributary: | UNNAMED TRIBUTARY |

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

TRK992050

**General conditions**

a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) That 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) That 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. THAT the consent holder shall undertake such monitoring of the activities licensed by this consent, as deemed reasonably necessary by the General Manager, Taranaki Regional Council, subject to section 35(2)(d) and section 36 of the Resource Management Act 1991. This monitoring information is to be forwarded to the General Manager, Taranaki Regional Council, upon request.

2. THAT the discharge shall not contain concentrations of any chemical, biological or physical contaminant [other than heat and suspended solids] greater than those found in the water abstracted from the Inaha Stream.

3. THAT the cooling water discharge to the Inaha Stream shall not exceed 35.0 degrees Celsius in temperature at the point of the discharge to the unnamed tributary of the Inaha Stream.

4. THAT the cooling water discharge to the Inaha Stream shall not contain a concentration of suspended solids in excess of 100 $gm^{-3}$

5. THAT after allowing for a mixing zone of 45 metres extending downstream of the confluence of the unnamed tributary with the Inaha Stream, the discharge [in conjunction with any other discharge pertaining to the same property], 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 material;
(b) any conspicuous change in the colour or visual clarity;
(c) any emission of objectionable odour;
(d) the rendering of fresh water unsuitable for consumption by farm animals;
(e) any significant adverse effects on aquatic life, habitats or ecology;
(f) any visible bacterial and/or fungal growths; and
(g) an increase in temperature of more than 3.0 degrees Celsius.

6. THAT the consent holder shall operate and maintain, to the satisfaction of the General Manager, Taranaki Regional Council, a discharge temperature measuring device and shall keep records of the discharge temperature during the exercise of this consent; such records to be made available to the General Manager, Taranaki Regional Council, upon request.

7. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2001, June 2003, June 2005, June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this 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 31 May 1999

For and on behalf of
TARANAKI REGIONAL COUNCIL

_____
DIRECTOR—RESOURCE MANAGEMENT

# Water Permit

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

| | |
|---|---|
| Name of Consent Holder: | Taranaki By-Products Limited<br>PO Box 172<br>Hawera 4640 |
| Decision Date (Change): | 21 January 2015 |
| Commencement Date (Change): | 21 January 2015 (Granted: 31 May 1999) |

## Conditions of Consent

| | |
|---|---|
| Consent Granted: | To take up to 2,160 cubic metres/day (50 litres/second) of water from the Inaha Stream for a rendering operation |
| Expiry Date: | 1 June 2019 |
| Review Date(s): | June 2017 |
| Site Location: | Kohiti Road, Okaiawa |
| Legal Description: | Lot 3 DP 378038 Lot 2 DP 410593 Lots 2-3 DP 6457 (Site of take) |
| Grid Reference (NZTM) | 1701884E-5624101E |
| Catchment: | Inaha |

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

## General conditions

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

b) That 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) That 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. That the means of taking water shall be maintained to the satisfaction of the Chief Executive, Taranaki Regional Council.

2. That a minimum flow of at least 25 litres/second shall be maintained in the stream at all times downstream of the point of abstraction.

3. That the consent holder shall install and operate to the satisfaction of the Chief Executive, Taranaki Regional Council, an abstraction rate measuring device and shall keep records of the dates and daily quantities of water abstracted during the exercise of this consent; such records to he made available to the Chief Executive, Taranaki Regional Council, upon request.

4. That the consent holder shall to the satisfaction of the Chief Executive, Taranaki Regional Council, monitor and keep daily records of the flows in the lnaha Stream at the Kohiti Road Bridge; such records to be made available to the Chief Executive, Taranaki Regional Council, upon request.

5. That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2017, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this 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 21 January 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: | Taranaki By-Products Limited<br>P O Box 172<br>HAWERA 4640 |
| Change To Conditions Date: | 9 November 2009 [Granted: 15 December 1999] |

## Conditions of Consent

| | |
|---|---|
| Consent Granted: | To discharge up to 1400 cubic metres/day of treated wastewater from a rendering operation and from a farm dairy via spray irrigation onto and into land, and to discharge emissions into the air, in the vicinity of the Inaha Stream and its tributaries |
| Expiry Date: | 1 June 2019 |
| Review Date(s): | June 2011, June 2014, June 2017 |
| Site Location: | Kohiti Road, Okaiawa |
| Legal Description: | Existing areas: Lot 1 DP 6457 Pt Sec 93 Blk IV Waimate SD [factory site], Lot 1 DP 378038, Pt Sec 93 Lots 2 & 3 DP 6457 Ngatimanuhiakai 17B2 17A2 17A3 Sec 88 Pt Sec 90 Lot 1 DP 10174 Lot 1 DP 11864 Pt Secs 90 & 94 DP SO219 Pt Sec 8 Sec 9 Pt Sec 154 Pt Sec 87 & Sec 89 Lot 2 DP 10412 Sec 92 Ngatimanuhiakai 3B Pt Sec 149 Ngatimanuhiakai 17B1 Lots 1 & 2 DP 4415 Sec 151 Blk IV Waimate SD<br><br>New areas:<br>Ngatimanuhiakai 3A Blk IV Waimate SD, Ngatimanuhiakai 2A & 2B Blk, Ngatimanuhiakai 4A Blk IV Waimate SD, Ngatimanuhiakai 10A2 Blk IV Waimate SD, Lot 1 DP 5153 Sec 86 Blk Waimate SD, Lot 1 DP 10412 Lot 2 DP 11864 Pt Sec 94 Blk IV Waimate SD, Ngatimanuhiakai 7C1 Blk IV Waimate SD [between the following points;<br>NW (1700589E-5625245N), NE (1700909E-5625245N), SW (1700631E-5625092N), SE (1700921E-5625046N) |
| Catchment: | Inaha |

*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**

**Condition 1 – new**

1. The discharge authorised by this consent shall only occur on the land shown in the map labelled Figure 1 attached.

**Conditions 2 to 12 [previously conditions 1 to 11] – unchanged**

**Management plan**

2. Prior to the exercise of the consent, the consent holder shall provide, and subsequently shall maintain, a spray irrigation management plan, to the approval of the Chief Executive, Taranaki Regional Council, outlining the management of the system, which shall demonstrate ability to comply with consent conditions and shall address the following matters:

a) designated application areas;
b) selection of appropriate irrigation methods for different types of terrain;
c) application rate and duration;
d) application frequency;
e) farm management and operator training;
f) soil and herbage management;
g) prevention of runoff and ponding;
h) minimisation and control of odour effects offsite;
i) operational control and maintenance of the spray irrigation system;
j) monitoring of the effluent [physicochemical];
k) monitoring of soils and herbage [physicochemical];
l) monitoring of groundwater beneath the irrigated area [physicochemical];
m) monitoring of drainage water downslope of the irrigated area [physicochemical];
n) monitoring of Inaha Stream and relevant tributaries;
o) remediation measures;
p) liaison with submitters to the consent, and interested parties;
q) reporting monitoring data;
r) procedures for responding to complaints; and
s) notification to the Council of non-compliance with the conditions of this consent.

An objective of the plan shall be to maximise discharges to land and to minimise discharges to surface water under consent 2049.

3. The consent shall be exercised in accordance with the procedures set out in the spray irrigation management plan, and the consent holder shall subsequently adhere to and comply with the procedures, requirements, obligations and other matters specified in the management plan, except by the specific agreement of the Chief Executive, Taranaki Regional Council. In case of any contradiction between the management plan and the conditions of this resource consent, the conditions of this resource consent shall prevail.

4. The spray irrigation management plan described in special condition 2 of this consent shall be subject to review upon two months notice by either the consent holder or the Taranaki Regional Council. Further, the consent holder shall review the spray irrigation management plan annually and shall provide the reviewed plan to the Chief Executive, Taranaki Regional Council, by 31 May each year.

5. The consent holder shall designate an officer with the necessary qualifications and/or experience to manage the spray irrigation system. The officer shall be regularly trained on the content and implementation of the spray irrigation management plan, and shall be advised immediately of any revision or additions to the spray irrigation management plan.

6. The consent holder shall at all times adopt the best practicable option or options, as defined in Section 2 of the Resource Management Act 1991, to prevent or minimise the adverse effects of the discharges on the environment. This shall include, but not be limited to the minimisation of total nitrogen concentration in the treated effluent.

7. In circumstances where spray irrigation of wastewater is not possible, and where a dilution rate of 1:200 in the Inaha Stream cannot be maintained, the consent holder shall seek the permission of the Chief Executive, Taranaki Regional Council, prior to discharging wastewater to the Inaha Stream.

**Odour and spray effects**

8. The level of dissolved oxygen within the wastewater pond from which irrigation water is drawn shall be maintained above 1.0 $gm^{-3}$ at all times.

9. There shall be no offensive or objectionable odour as a result of the irrigation of treated wastewater at or beyond the boundary of the property or properties on which spray irrigation is occurring.

10. There shall be no spray drift as a result of the irrigation of treated wastewater at or beyond the boundary of the property or properties on which spray irrigation is occurring.

**Land effects**

11. The sodium adsorption ratio [SAR] of the wastewater shall not exceed 15.

12. There shall be no ponding of wastewater, and/or any direct discharge to a watercourse due to the exercise of this consent.

**Condition 13 [previously condition 12 - changed]**

13. The edge of the spray zone shall be at least:

    a) 25 metres from the banks of any watercourse;
    b) 50 metres from any bore, well or spring used for water supply purposes;
    c) 20 metres from any public road, except as detailed in f) and g) of this condition;
    d) 20 metres from any property boundary;
    e) 150 metres from any dwellinghouse or place of public assembly unless the written approval of the occupier has been obtained to allow the discharge at a lesser distance;
    f) 200 metres from Normanby Road adjacent to the property described as Lots 3 & 4, Pt Lot 1 DP 2707, Lot 1 DP 3731, Blk IV, Waimate SD, unless the written approval of the occupier has been obtained to allow the discharge at a lesser distance; and
    g) 50 metres from Ahipaipa Road adjacent to the properties described as Pt Lot 1 and Lot 2 DP 3322, Lot 2 DP12129, Blk IV, Waimate SD.

**Conditions 14 to 26 [previously conditions 13 to 25] – unchanged**

14. The effluent application rate shall not exceed 300 kg nitrogen/hectare/year except on land described as Pt Sec 154 Blk IV Waimate SD, where the effluent application rate shall not exceed 200 kg/nitrogen/hectare/year.

15. The consent holder shall investigate, and report in writing on, options for upgrading the wastewater treatment system to reduce the concentration of ammonia in the wastewater prior to discharge; the report to be received by the Chief Executive, Taranaki Regional Council, not later than twelve months from the date the consent is granted. Any necessary works associated with the report on reduction of ammonia concentrations shall be completed within twelve months after the receipt of the report.

16. The average application rate shall not exceed 5 mm/hour.

17. The return period between applications shall be at least seven days and the application depth shall not exceed 25 mm at each application.

### Monitoring and liaison

18. The consent holder shall site, install and maintain to the satisfaction of the Chief Executive, Taranaki Regional Council, a minimum of nine monitoring bores for the purpose of determining groundwater quality in the vicinity of the discharge. The bores are to be sited in the following locations: upslope of the Kohiti Road and Katotauru Road irrigation areas (2), at the southern boundary of the western Normanby Road irrigation area (2), within the Normanby Road, Kohiti Road and Katotauru Road irrigation areas (3), at the southern boundary of the Katotauru irrigation area, and at the southern boundary of the Ahipaipa Road irrigation area. The spring downslope of the Normanby Road irrigation area, and three bores in the vicinity of Inuawai Road shall also be monitored.

19. The consent holder shall undertake such baseline and operational monitoring of the activities licensed by this consent, as deemed reasonably necessary by the Chief Executive, Taranaki Regional Council.

20. The consent holder and staff of the Regional Council shall meet as appropriate, quarterly or at such other frequency as the parties may agree, with representatives of Ngati Manuhiakai Hapu and other interested submitters to the consent, and any other interested party at the discretion of the Chief Executive, Taranaki Regional Council, to discuss any matter relating to the exercise of the resource consent, in order to facilitate ongoing consultation.

21. The consent holder shall, where practicable, advise the Chief Executive, Taranaki Regional Council, and representatives of Ngati Manuhiakai Hapu, prior to discharge to Inaha Stream under consent 2049.

### Mitigation

22. Should monitoring of the discharge under conditions 14 and 18 indicate contamination of local groundwater as a result of the exercise of this consent, the consent holder shall:

    a) undertake appropriate remedial action as soon as practicable as described in the spray irrigation management plan prepared under condition 2, or such action reasonably required by the Chief Executive, Taranaki Regional Council;
    b) shall review the spray irrigation management plan and incorporate such reasonable modifications as are considered necessary by the Chief Executive, Taranaki Regional Council; and
    c) where water supplies are significantly affected, immediately provide alternative supplies as reasonably required by the Chief Executive, Taranaki Regional Council.

### Review

23. The consent holder may apply to the Council for a change or cancellation of any of the conditions of this consent in accordance with section 127(1)(a) of the Resource Management Act 1991 to take account of operational requirements or the results of monitoring.

24. The Taranaki Regional Council may review conditions 7 and 14 of this consent within two weeks after the completion of works to be investigated under condition 15 of this consent, for the purpose of evaluating the appropriateness of the required dilution rate and application rate, and the effects of the discharge on the Inaha Stream and soil.

25. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2001, and/or June 2007, for the purpose of assessing the need to increase the land area for wastewater disposal, reduce nitrogen loading to land and/or increase treatment at the wastewater treatment system to reduce the nitrogen concentration of the effluent.

26. The Taranaki Regional Council may, pursuant to section 128 of the Resource Management Act 1991, review any or all of the conditions of this consent by giving notice of review during June 2001, June 2003, June 2005, June 2007, June 2009, June 2011, June 2014 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this consent, which either were not foreseen at the time the application was considered or which it was not appropriate to deal with at that time.

Signed at Stratford on 9 November 2009

For and on behalf of
Taranaki Regional Council

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**Director-Resource Management**

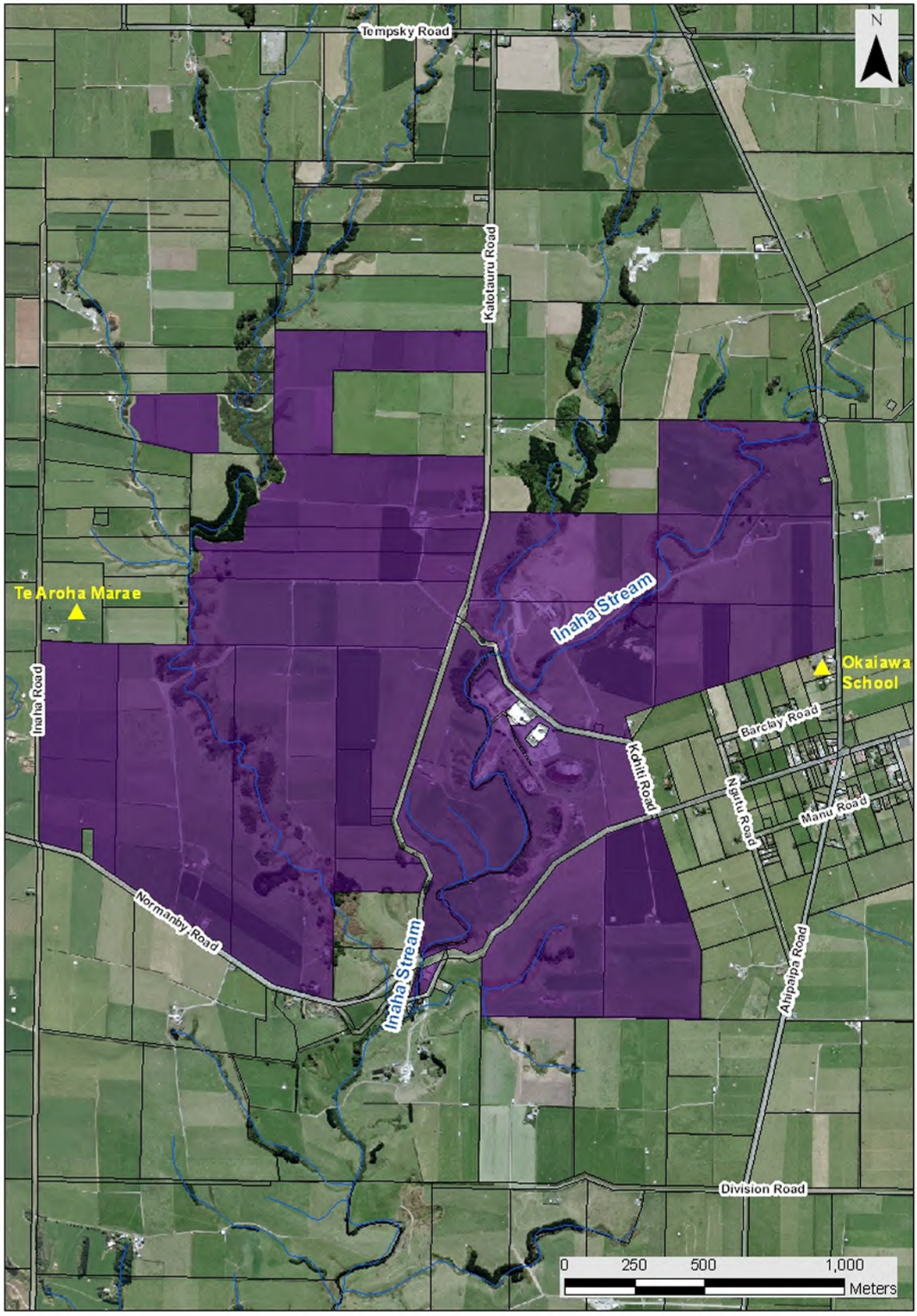


**Figure 1 Location of the authorised area to receive wastewater, via spray irrigation, onto and into land**

# Discharge Permit

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

| | |
|---|---|
| Name of Consent Holder: | Taranaki By-Products Limited<br>P O Box 172<br>HAWERA 4640 |
| Decision Date: | 11 October 2011 |
| Commencement Date: | 11 October 2011 |

## Conditions of Consent

| | |
|---|---|
| Consent Granted: | To discharge emissions into the air from rendering operations and associated processes including wastewater treatment at or about (NZTM) 1701965E-5624119N and burial of material at or about (NZTM) 1702416E-5624339N |
| Expiry Date: | 1 June 2024 |
| Review Date(s): | June 2013, June 2015, June 2017,<br>June 2019, June 2021, June 2023 |
| Site Location: | Kohiti Road, Okaiawa |
| Legal Description: | Lot 3 DP 378038 Lot 2 DP 410593 Lots 2-3 DP 6457, Lot 1 DP 6457 Blk IV Waimate SD, Lot 1 DP 410593 [TBE], Lot 1 DP 10174 Lot 1 DP 11864 Sec 88 Pt Sec 90 Blk IV Waimate SD |

*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.

### 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 actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.

2. The discharge authorised by this consent shall not give rise to an odour at or beyond the boundary of the site that is offensive or objectionable.

   Note: With respect to this condition, the consent holder's site is defined as the areas shown in the map attached.

3. For the purposes of condition 2, an odour shall be deemed to be offensive or objectionable if:

   a. it is held to be so in the opinion of an enforcement 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 two (2) hours continuously, or it occurs frequently during a single period of more than four (4) hours; and/or
   c. no less than two individuals from at least two different properties, 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 at the frequency and duration specified in (b). Each declaration shall be signed and dated and include:

      1. the individuals' names and addresses;
      2. the date and time the objectionable or offensive odour was detected;
      3. details of the duration, frequency, intensity and nature of the odour that cause it to be considered offensive or objectionable;
      4. the location of the individual when it was detected; and
      5. the prevailing weather conditions during the event.

4. The consent holder shall continue to employ a suitably qualified and experienced person in the role of Environmental Manager, whose responsibilities shall include ensuring compliance with the conditions of this consent.

5. No fish or fish parts shall be received or processed on the premises.

6. By 30 April 2013, and every two years thereafter, the consent holder shall provide certification by a suitably qualified independent person that the works , processes and equipment relevant to all discharges to air from the site are operational in accordance with good engineering practice.

7. Before 2 February 2012, the consent holder shall prepare an Air Discharge Management Plan for the site that, to the satisfaction of the Chief Executive of the Taranaki Regional Council, details how discharges to air from the site will be managed to ensure compliance with conditions of this consent. The plan shall include but not necessarily be limited to;

    a. A description of the air quality objectives sought by the plan;

    b. The identification of key personnel responsible for managing air discharges and implementing the Management Plan;

    c. A description of the activities on the site and the main potential sources of odour emissions;

    d. A description of storage and treatment procedures (including specification of storage times and preservative dosing concentrations) for ensuring that only high quality raw material is processed;

    e. The identification and description of the odour and dust mitigation measures in place;

    f. The identification and description of relevant operating procedures and parameters that need to be controlled to minimise emissions;

    g. A description of contingency procedures for addressing situations, such as equipment failure or spillage of raw material or chemicals, which could result in a discharge to air of odorous emissions that are offensive or objectionable beyond the boundary of the plant;

    h. A description of monitoring and maintenance procedures for managing the odour mitigation measures including record keeping of control parameters and maintenance checks; and

    i. Details of staff training proposed to enable staff to appropriately manage the odour mitigation measures.

8. Operations on site shall be undertaken in accordance with the Air Discharge Management Plan, required by condition 7 above.

9. The Air Discharge Management Plan described in special condition 7 of this consent shall be subject to review upon two months notice by either the consent holder or the Taranaki Regional Council. Further, the consent holder shall review the management plan annually and provide the reviewed plan to the Taranaki Regional Council, by 31 May each year.

10. 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 purpose of this condition, discharges in excess of the following limits are deemed to be offensive or objectionable:

    a. dust deposition rate 0.13 g/m$^2$/day; and/or

    b. suspended dust level 3 mg/m$^3$.

11. The consent holder shall consult and inform the local community about activities on the site, specifically those relating to the exercise of this consent, by:

    a. Four times per year, providing a newsletter to all landowners and/or occupiers of properties within 3 kilometres of the site; and

    b. Convening a meeting with the Director - Resource Management, Taranaki Regional Council (or their delegate), and the local community annually or at such other frequency as the parties may agree.

12. 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 2013 and/or every two years thereafter. The purpose of any review would be to ensure 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. When determining if any review is required the Council will take into account any expressed views of the Okaiawa community.

Signed at Stratford on 11 October 2011

For and on behalf of
Taranaki Regional Council

_____

**Director-Resource Management**

TRK995426

# DISCHARGE PERMIT

**Pursuant to the RESOURCE MANAGEMENT ACT 1991**
**a resource consent is hereby granted by the**
**Taranaki Regional Council**

| | |
|---|---|
| Name of Consent Holder: | TARANAKI BY-PRODUCTS LIMITED<br>PO BOX 172 HAWERA |
| Consent Granted Date: | 31 May 1999 |

## CONDITIONS OF CONSENT

| | |
|---|---|
| Consent Granted: | TO DISCHARGE UP TO 1,095 LITRES/SECOND OF STORMWATER FROM AN ANIMAL RENDERING SITE INTO AN UNNAMED TRIBUTARY OF THE INAHA STREAM AT OR ABOUT GR: Q21:119-858, Q21:120-858 AND Q21:121-858 |
| Expiry Date: | 1 June 2019 |
| Review Date[s]: | June 2001, June 2003, June 2005, June 2011 and June 2017 |
| Site Location: | KOHITI ROAD OKAIAWA |
| Legal Description: | LOTS 1 & 2 DP6457 BLK IV WAIMATE SD |
| Catchment: | INAHA 351.000 |
| Tributary: | UNNAMED TRIBUTARY |

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

TRK995426

**General conditions**

a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) That 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) That 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. THAT the consent holder shall advise the Taranaki Regional Council prior to making any change in the processes undertaken at the site which could significantly alter the nature of the discharge.

2. THAT the discharge shall not exceed the following parameters:

| Component | Concentration |
|---|---|
| pH range | 6-9 |
| oil and grease | 15 $gm^{-3}$ |
| suspended solids | 100 $gm^{-3}$ |

This condition shall apply prior to the entry of the discharge into the receiving water at designated sampling point[s] approved by the General Manager, Taranaki Regional Council.

3. THAT after allowing for reasonable mixing, within a mixing zone extending 45 metres from the confluence of the unnamed tributary with the Inaha Stream, the discharge [in conjunction with any other discharges pertaining to the same property], 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 emission of objectionable odour;

(d) the rendering of freshwater unsuitable for consumption by farm animals;

(e) any significant adverse effects on aquatic life, habitats or ecology; and

(f) any visible bacterial and/or fungal growths.

4. THAT within three months of the granting of this consent, the consent holder shall prepare a contingency plan outlining measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not licensed by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.

5. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2001, June 2003, June 2005, June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this 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 31 May 1999

For and on behalf of
TARANAKI REGIONAL COUNCIL

_____
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: | Taranaki By-Products Limited<br>P O Box 172<br>HAWERA |
| Change To Conditions Date: | 4 August 2000 [Granted: 30 March 2000] |

## Conditions of Consent

| | |
|---|---|
| Consent Granted: | To discharge up to 200 tonnes/day of wastes from meat rendering operations by burial into land in the vicinity of the Inaha Stream at or about GR: Q21:121-859 |
| Expiry Date: | 1 June 2019 |
| Review Date(s): | June 2001, June 2003, June 2005, June 2011, June 2017 |
| Site Location: | Kohiti Road, Okaiawa |
| Legal Description: | Lot 1 DP 10174 Lot 1 DP 11864 Sec 88 Pt Sec 90 SO 268 Blk IV Waimate SD |
| Catchment: | Inaha |

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

**General conditions**

a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) That 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) That 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**

**special condition 1 [amended]**

1. THAT by 1 November 2000, the consent holder shall provide a waste burial management plan, to the approval of the General Manager, Taranaki Regional Council, outlining the management of the system, which shall demonstrate ability to comply with consent conditions and shall address the following matters:

a) nature of wastes discharged;
b) discharge control;
c) waste cover;
d) addition of hydrated lime to stabilise the wastes;
e) minimisation and control of odour effects offsite;
f) stormwater control;
g) leachate management;
h) monitoring of groundwater beneath the burial area [physicochemical];
i) site re-instatement and after care (including maintaining the integrity of the cover material);
j) site contouring;
k) reporting monitoring data;
l) procedures for responding to complaints; and
m) notification to the Council of non-compliance with the conditions of this consent.

**special conditions 2-5 [unchanged]**

2. THAT the consent shall be exercised in accordance with the procedures set out in the waste burial management plan, and the consent holder shall subsequently adhere to and comply with the procedures, requirements, obligations and other matters specified in the management plan, except by the specific agreement of the General Manager, Taranaki Regional Council. In case of any contradiction between the management plan and the conditions of this resource consent, the conditions of this resource consent shall prevail.

3. THAT the waste burial management plan described in special condition 1 of this consent shall be subject to review upon two months notice by either holder the Taranaki Regional Council.

4. THAT the consent holder shall designate an officer with the necessary qualifications and/or experience to manage the waste burial site. The officer shall be regularly trained on the content and implementation of the burial management plan, and shall be advised immediately of any revision or additions to the burial management plan.

5. THAT the disposal pit[s] shall not intercept shallow groundwater.

**special conditions 6 – 7 [amended]**

6. THAT the disposal pits shall be constructed when required in general accordance with the information supplied by the applicant in support of application 1084.

7. THAT the consent holder shall notify the Council of the commencement to construct additional disposal pits outside of the disposal area indicated in the map supporting the application.

**special condition 8 [unchanged]**

8. THAT an officer of the Council is to inspect all constructed disposal pits prior to disposal operations.

**special condition 9 [amended]**

9. THAT special conditions 1 to 4 shall apply after 1 November 2000 when the disposal pit required by special condition 6 is constructed and also for all subsequent disposal pits.

**special conditions 10 – 15 [unchanged]**

10. THAT the discharged material shall be covered within a period of four hours or less so as to avoid the generation of offensive offsite odours.

11. THAT at the completion of the disposal operation a low permeability, clean, compacted soil cover with a minimum thickness of 1.0m be placed over the discharged wastes.

12. THAT the cover material and surrounding land shall be contoured such that all stormwater is directed away from the disposal area to the satisfaction of the General Manager, Taranaki Regional Council.

13. THAT the disposal site shall be rehabilitated and pasture re-established to the satisfaction of the General Manager, Taranaki Regional Council.

14. THAT there shall not be any irrigation of effluent under resource consent 3941 or resource consent 2466 onto the disposal area.

15. THAT the exercise of this consent shall not lead, or be liable to lead, to a direct discharge of contaminants to a surface water body.

**special condition 16 [amended]**

16. THAT the consent holder shall install and maintain, to the satisfaction of the General Manager, Taranaki Regional Council, a minimum of eight monitoring bores for the purpose of determining groundwater quality in the vicinity of the discharge.

**special condition 17-18 [unchanged]**

17. THAT the consent holder may apply to the Council for a change or cancellation of any of the conditions of this consent in accordance with section 127(1)(a) of the Resource Management Act 1991 to take account of operational requirements or the resources of monitoring.

18. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2001, June 2003, June 2005, June 2011 and/or June 2017, 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 consent, which was 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 4 August 2000

For and on behalf of
Taranaki Regional Council

_____

**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: | Taranaki By-Products Limited<br>P O Box 172<br>HAWERA |
| Consent Granted Date: | 4 October 2004 |

## Conditions of Consent

| | |
|---|---|
| Consent Granted: | To erect, place and maintain two culverts in the Inaha Stream for farm access purposes at or about GR: Q21:121-860 and Q21:125-863 |
| Expiry Date: | 1 June 2023 |
| Review Date(s): | June 2011, June 2017 |
| Site Location: | Kohiti Road, Hawera |
| Legal Description: | Secs 89 & 90 Blk IV Waimate SD |
| Catchment: | Inaha |

*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 consent shall be undertaken generally in accordance with the documentation submitted in support of application 3271. In the case of any contradiction between the documentation submitted in support of application 3271 and the conditions of this consent, the conditions of this consent shall prevail.

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement and upon completion of the initial installation and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the river bed or discharges to water.

4. Once initial work is complete, any further instream works shall take place only between 1 November and 30 April inclusive, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

5. The consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to avoid or minimise the discharge of silt or other contaminants into water or onto the riverbed and to avoid or minimise the disturbance of the riverbed and any adverse effects on water quality.

6. The consent holder shall ensure the area and volume of riverbed disturbance shall, so far as practicable, be minimised and any areas which are disturbed shall, so far as practicable, be reinstated.

7. The structures authorised by this consent shall be removed and the area reinstated, if and when the structures are no longer required. The consent holder shall notify the Taranaki Regional Council at least 48 hours prior to removal and reinstatement.

8. The structures which are the subject of this consent shall not restrict the passage of fish.

9. The consent holder shall prevent stock at all times from accessing all water bodies, including wetlands, on or bordering the consent holder's property, upstream of Kohete Road bridge, by constructing and maintaining fences or other controls, located to provide for the establishment of riparian margins; such means of prevention to be established within four years of the granting of this consent.

10. The consent holder shall undertake planting and subsequent maintenance of the riparian margins of the water bodies within the fenced or controlled area(s) as required by special condition 9, to the satisfaction of the Chief Executive, Taranaki Regional Council, within four years of the granting of this consent, for the purpose of enhancing water quality and aquatic habitat.

11. The invert of the culverts shall be not less than 50 mm below the bed of the stream. Appropriate headwall structures shall be constructed to protect the intake and outlet of the culverts from erosion.

12. This consent shall lapse on the expiry of five years after the date of issue of this consent, 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.

13. 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 2011 and/or June 2017, 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 4 October 2004

For and on behalf of
Taranaki Regional Council

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**Director-Resource Management**

# Water Permit

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

| | |
|---|---|
| Name of Consent Holder: | Taranaki By-Products Limited<br>P O Box 172<br>HAWERA 4640 |
| Decision Date: | 3 February 2014 |
| Commencement Date: | 3 February 2014 |

## Conditions of Consent

| | |
|---|---|
| Consent Granted: | To take and use groundwater for industrial water supply purposes |
| Expiry Date: | 1 June 2029 |
| Review Date(s): | June 2017, June 2023 |
| Site Location: | 179 Katotauru Road, Okaiawa |
| Legal Description: | Ngatimanuhiakai 2B (Site of take & use) |
| Grid Reference (NZTM) | 1701636E-5624804N |
| Catchment: | Inaha |

*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 total volume of water taken from the 'Bore 3' (GND2380) at a rate not exceeding 22.8 litres per second (1,970 cubic metres per day)

2. The bore shall be easily identifiable by a permanent label, which may be welded or engraved on the casing, or on the equivalent fixed part of the well construction or associated building. The bore shall be labelled with the bore number assigned by Taranaki Regional Council - GND2380.

3. The consent holder shall ensure that there is access into the well that enables the manual measurement of static and pumping water levels.

4. Before exercising this consent the consent holder shall install, and thereafter maintain a water meter and a datalogger at the site of taking (or a nearby site in accordance with Regulation 10 of the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*. The water meter and datalogger shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of ± 5%. Records of the date, the time (in New Zealand Standard Time) and the rate and volume of water taken at intervals not exceeding 15 minutes, shall be made available to the Chief Executive, Taranaki Regional Council at all reasonable times.

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

5. The consent holder shall provide the Chief Executive, Taranaki Regional Council with a document from a suitably qualified person certifying that water measuring and recording equipment required by the conditions of this consent ('the equipment'):

   (a) has been installed and/or maintained in accordance with the manufacturer's specifications; and/or

   (b) has been tested and shown to be operating to an accuracy of ± 5%.

   The documentation shall be provided:

   (i) within 30 days of the installation of a water meter or datalogger;

   (ii) at other times when reasonable notice is given and the Chief Executive, Taranaki Regional Council has reasonable evidence that the equipment may not be functioning as required by this consent; and

   (iii) no less frequently than once every five years.

# Discharge Permit

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

| | |
|---|---|
| Name of Consent Holder: | Taranaki By-Products Limited<br>PO Box 172<br>Hawera 4640 |
| Decision Date: | 21 January 2015 |
| Commencement Date: | 21 January 2015 |

## Conditions of Consent

| | |
|---|---|
| Consent Granted: | To discharge emissions into the air from the burning of pallets, paper and cardboard |
| Expiry Date: | 01 June 2029 |
| Review Date(s): | June 2017, June 2023 |
| Site Location: | Kohiti Road, Okaiawa |
| Legal Description: | Lot 3 DP 378038 Lot 2 DP 410593 Lots 2-3 DP 6457 (Discharge source & site) |
| Grid Reference (NZTM) | 1701917E-5623971N |

*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 and shall include as a minimum:
    - having regard to the prevailing and predicted wind speed and direction at the time of burning in order to minimise offsite effects;
    - allowing the waste material to dry before burning;
    - starting a small fire with the driest material and adding further material once it is blazing, as opposed to igniting a large stack and leaving it unattended.

2. The materials for combustion are restricted to untreated wood or sawdust, paper and cardboard.

3. There shall be no objectionable or offensive odour to the extent that it causes an adverse effect at or beyond the boundary of the site.

    Note: For the purposes of this condition:

    - The site is defined as Lot 3 DP 378038 Lot 2 DP 410593 Lots 2-3 DP 6457; and
    - Assessment under this condition shall be in accordance with the *Good Practice Guide for Assessing and Managing Odour in New Zealand, Air Quality Report 36, Ministry for the Environment, 2003.*

4. The consent holder, or an authorised agent, shall supervise burning at all times.

5. The dust deposition rate beyond the property boundary arising from the discharge shall be less than 0.13 $g/m^2/day$ or 4.0 $g/m^2/30$ days.

6. Any discharge to air from the site shall not give rise to any offensive, objectionable, noxious or toxic levels of dust at or beyond the boundary of the property, and in any case, suspended particulate matter shall not exceed 3 $mg/m^3$ (measured under ambient conditions) beyond the boundary of the site.

7. The discharges authorised 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.

8. This consent shall lapse on 31 March 2020, 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 2017 and/or June 2023, 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 21 January 2015

For and on behalf of
Taranaki Regional Council

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A D McLay
**Director - Resource Management**

6. Before exercising this consent, the consent holder shall install and subsequently maintain equipment to measure and record the water level within Bore 3 to an accuracy of ± 0.05 metres at intervals not exceeding 15 minutes.

7. The measurements made in accordance with condition 4 and 6 of this consent, shall be transmitted to the Taranaki Regional Council's computer system, in a format to be advised by the Chief Executive, Taranaki Regional Council, to maintain a 'real time' record of the water taken and bore water levels.The records of water taken and the water level within each bore shall:

   (a) be in a format that, in the opinion of the Chief Executive, Taranaki Regional Council, is suitable for auditing; and

   (b) specifically record the water taken as 'zero' when no water is taken.

8. The water meter, level monitoring device and datalogger shall be accessible to Taranaki Regional Council officer's at all reasonable times for inspection and/or data retrieval. The data logger shall be designed and installed so that Council officers can readily verify that it is accurately recording the required information.

9. If any measuring or recording equipment breaks down, or for any reason is not operational, the consent holder shall advise the Chief Executive, Taranaki Regional Council immediately. Any repairs or maintenance to this equipment must be undertaken by a suitably qualified person.

10. At all times the consent holder shall adopt the best practicable option (BPO) to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of groundwater, including, but not limited to, the efficient and conservative use of water.

11. This consent shall lapse on 31 March 2019, 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.

12. 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 2023 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 3 February 2014

For and on behalf of
Taranaki Regional Council

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**Director-Resource Management**

# Appendix II

# Categories used to evaluate environmental and administrative performance

# Categories used to evaluate environmental and administrative performance

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

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

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

## Environmental Performance

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

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

For example:

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

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

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

## Administrative performance

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

**Good:** Perhaps some administrative requirements of the resource consents were not met at a particular time, however this was addressed without repeated interventions from the Council staff. Alternatively adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

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

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