Silver Fern Farms Ltd Waitotara

Monitoring Programme

Annual Report

2020-2021

Technical Report 2021-61

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Taranaki Regional Council

Taranaki Regional Council
Private Bag 713
Stratford

ISSN: 1178-1467
Document: 2851428
Document: 2942406
March 2022

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Document: 2851428 (Word)
Document: 2942406 (Pdf)
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Executive summary

Silver Fern Farms Ltd (Silver Fern Farms) operates a meat processing plant located on Wai-inu Beach Road, Waitotara in the Waitotara catchment. This report, for the period 1 October 2020 to 30 September 2021 coincides with the processing season. It describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess Silver Fern Farms' 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 Silver Fern Farms' activities.

During the monitoring period, Silver Fern Farms Ltd demonstrated an overall good level of environmental performance.

Silver Fern Farms holds five resource consents, which include a total of 51 conditions setting out the requirements that they must satisfy. Silver Fern Farms holds resource consents to allow it to take and use groundwater and spring water, to discharge wastes by spray irrigation to land, to discharge stormwater and cooling water to an unnamed tributary of the Waitotara River, and to discharge emissions into the air.

The Council's monitoring programme for the year under review included three inspections, and the collection of three wastewater and 24 groundwater samples for physicochemical analysis. This includes monitoring of a bore which was installed on 5 November 2019. Silver Fern Farms supplied records of their own monitoring, as well as records of the volume of water abstracted and the volume of wastewater discharged.

During the year, Silver Fern Farms demonstrated a good level of environmental and high level of administrative performance with the resource consents.

Breaches of the abstraction permits were recorded during the monitoring period. This related to two matters. In one case, subsidence of the pump shed was causing pipes to break affecting the volume and rate of take. A temporary repair by the consent holder was undertaken but failed and the issue reoccurred. An abatement notice was issued. The shed was re-located and no further breaches of the consented limit have occurred. The other matter related to the exceedance of the instantaneous abstraction limit on three occasions, although the daily limit was being met. No action was taken as the incidents were relatively minor and both Silver Fern Farms and the Council were affected by problems with the telemetry system which caused a delay in receipt of the data..

For reference, in the 2020-2021 year, consent holders were found to achieve a high level of environmental performance and compliance for 86% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 11% of the consents, a good level of environmental performance and compliance was achieved.

In terms of overall environmental and compliance performance by the consent holder over the last several years, this report shows that the consent holder's performance remains at a good level.

This report includes recommendations for the 2021-2022 year, including a recommendation to undertake an optional review of consent 2260-3.1 in June 2022 in order to ensure that consent conditions are adequate to prevent adverse environmental effects, including potential effects upon the Wai-inu Beach municipal water supply.

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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 October 2020 to September 2021 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by Silver Fern Farms Ltd (Silver Fern Farms). Silver Fern Farms operates a meat processing plant situated on Wai-inu Beach Road at Waitotara, in the Waitotara catchment. The monitoring period coincides with the plant's processing season.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by Silver Fern Farms that relate to abstraction of water, discharge of wastes by spray irrigation to land, discharge of stormwater and cooling water in the Waitotara catchment, and the air discharge permit held by Silver Fern Farms to cover emissions to air from the site.

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

1.1.2 Structure of this report

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

- consent compliance monitoring under the RMA and the Council's obligations;
- the Council's approach to monitoring sites though annual programmes;
- the resource consents held by silver Fern Farms in the Waitotara catchment;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted at the Silver Fern Farms' site.

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

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

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

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

1.1.3 The Resource Management Act 1991 and monitoring

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

a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;
b. physical effects on the locality, including landscape, amenity and visual effects;
c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;

d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and

e. risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of 'effects' inasmuch as is appropriate for each activity. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the RMA to assess the effects of the exercise of consents. In accordance with Section 35 of the RMA, the Council undertakes compliance monitoring for consents and rules in regional plans, and maintains an overview of the performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continually re-evaluate its approach and that of consent holders to resource management and, ultimately, through the refinement of methods and considered responsible resource utilisation, to move closer to achieving sustainable development of the region's resources.

1.1.4 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by Silver Fern Farms, this report also assigns them a rating for their environmental and administrative performance during the period under review.

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

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

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

Environmental Performance

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

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

For example:

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

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

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

Administrative performance

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

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

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

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

For reference, in the 2020-2021 year, consent holders were found to achieve a high level of environmental performance and compliance for 86% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 11% of the consents, a good level of environmental performance and compliance was achieved.[1]

1.2 Process description

The meat processing plant was constructed in 1987 within pastoral lands beside Wai-inu Beach Road, approximately 3.5 km south of Waitotara and 3 km north of Wai-inu Beach. The location of the plant site is shown in Figure 1 and the layout of the irrigation system in Figure 2. The nearest dwellings are farmhouses, situated about 900 m to the north and 1.2 km to the south-east. The Waitotara River is located approximately 450 m to the north of the plant.

The plant primarily slaughters and processes sheep and lambs, but is also capable of handling bobby calves and goats. The site processes sheep and bobby calves, and during March 2019 operations were reduced from 7 days to 5 days a week. The majority of the processed output is exported. There are no fellmongery or rendering facilities, with all blood and renderable material taken off-site for processing.

[1] The Council has used these compliance grading criteria for 17 years. They align closely with the four compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

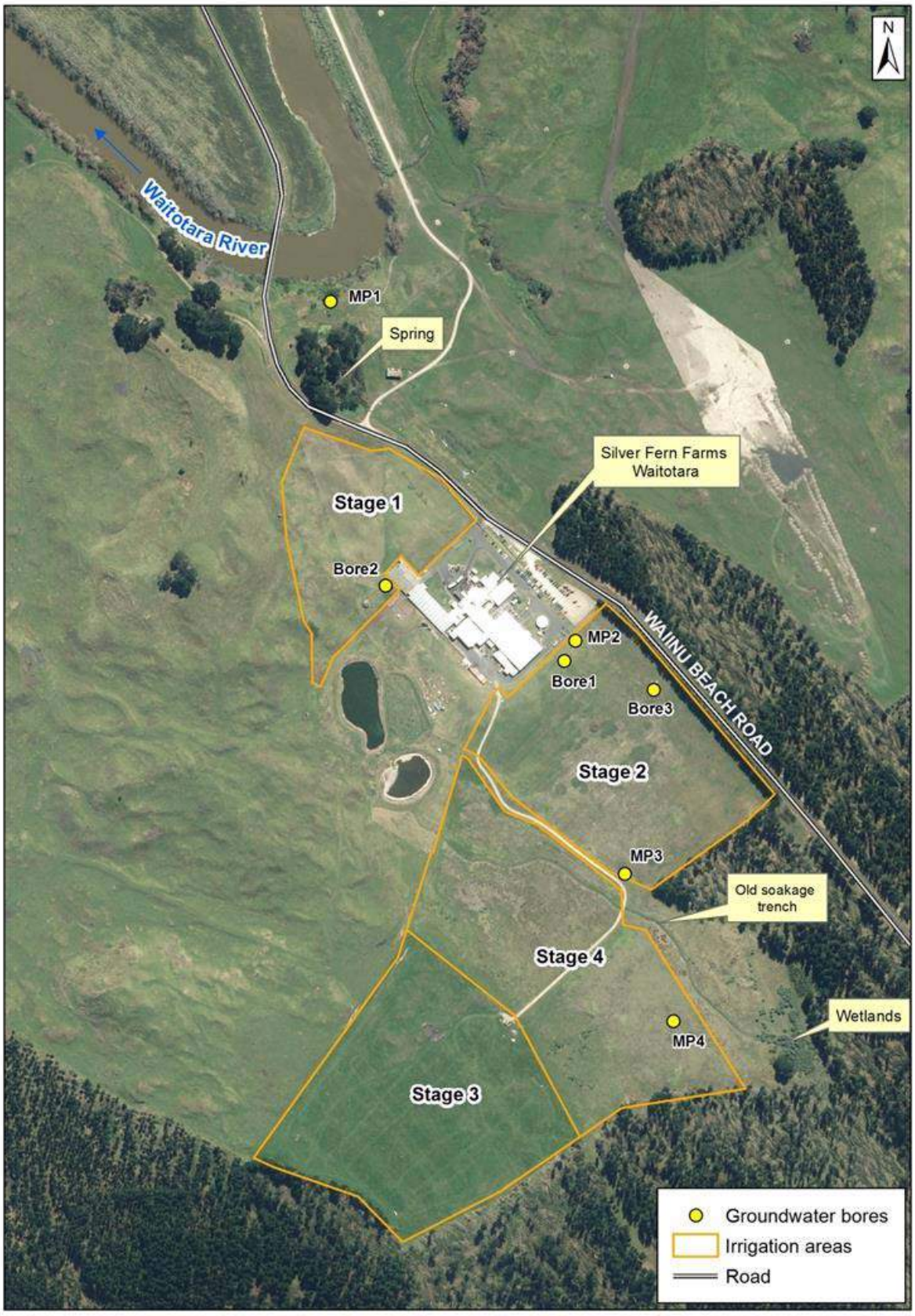

Figure 1 Location of SFF Waitotara meat processing plant showing irrigation areas and groundwater monitoring points

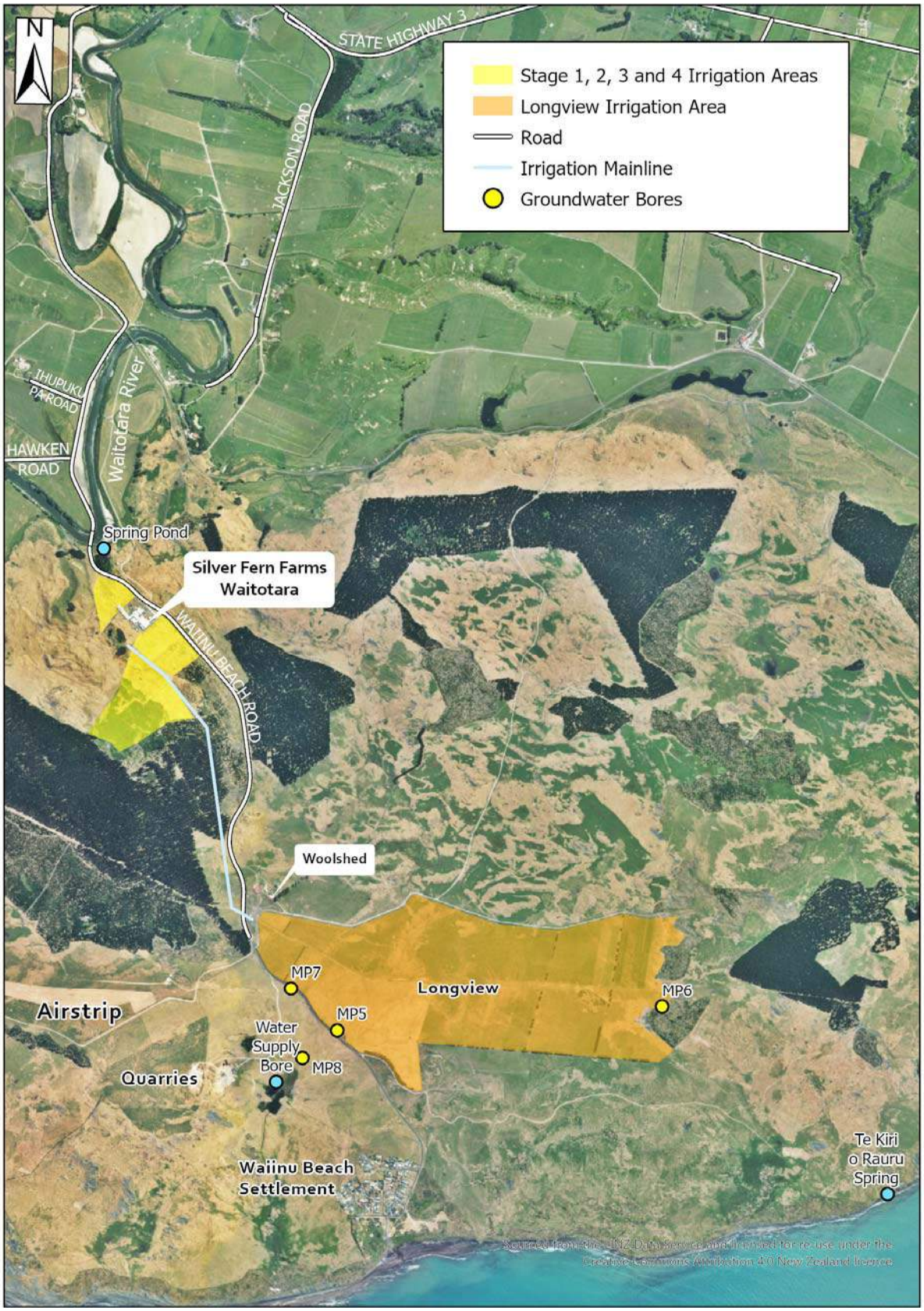

Figure 2 Location of SFF Waitotara meat processing plant showing irrigation areas and groundwater monitoring points

Ownership of the plant has changed twice. The original owner, Waitotara Meat Company, merged with Richmond Ltd in October 1999, which in turn amalgamated with PPCS Ltd in December 2004. PPCS Ltd was rebranded Silver Fern Farms Ltd in June 2008.

1.2.1 Water abstraction

The plant's water usage is proportional to the number of stock being processed through any particular period and the maximum daily water usage follows the same pattern as daily stock kill rate.

Water for operation of the plant is taken from two sources. Water of high quality is drawn from a deep aquifer via bores at the plant site. Water of lesser quality (high hardness) is piped from springs near the Waitotara River.

Three bores, each with the capacity to pump 770 m^3/d, pump from a depth of 122 to 140 m. Two bores are pumped at any one time, with the other being a reserve supply. The aquifer is recharged by rainfall/riverbed infiltration in the hill country north of Waitotara. Aquifer analysis undertaken by Silver Fern Farms, and checked by the Council, shows that the maximum sustainable yield is 3,000 m^3/d.

A secondary supply, for stock and yard washing purposes, is drawn at a rate of up to 350 m^3/d from springs which arise beside the Waitotara River. This is piped approximately 400 m to the plant across Wai-inu Beach Road.

1.2.2 Discharges to land

Wastewater derives primarily from two sources: the plant and the stockyards. Plant wastewater consists of wash-water from the washing of carcasses, pelts and offal, and from cleansing of process areas. Wastewater is produced from the external yards as a result of washing incoming stock, stockyard washings and of discharge from the truck-wash facility.

After primary treatment by screening, the wastewater is stored in two holding ponds before discharge onto land by spray irrigation. Screenings are spread mechanically on the irrigation areas.

The irrigation area was increased to a total area of 110.5 ha in January 2013. An area of 19.3 ha adjacent to the plant that was owned by Silver Fern Farms was irrigated by 15 independently controlled fixed sprinkler networks. An area of 91.2 ha on the farm of Longview Ltd, at a location about 2 km away towards the coast along Wai-inu Beach Road, was irrigated by one of three rotary boom travelling irrigators. Reticulation is by a ring main, around which a travelling irrigator is rotated manually according to weather conditions and wastewater availability. Irrigator run lengths are about 400 m, with a wetted width of 45 m, giving an area of about 1.8 ha per application. An independent automated control system is in place for control of spray drift towards Wai-inu Beach.

The land that is irrigated is largely undulating stabilised sand dunes, with an overlay of free draining yellow brown soils of very low natural fertility, that frequently have periods of soil moisture deficit. Properly managed, the irrigation system is expected to increase nutrient and moisture levels and moisture retention ability of the land while minimising the effect on groundwater quality.

The discharge of stormwater and wastewater is primarily managed by SFF Waitotara via the Wastewater Management Plan, which defines operational, monitoring and reporting procedures. The plan is essentially 'response driven' in that changes in operation of the treatment system are made in response to regular performance evaluations based on monitoring results.

1.2.3 Discharges to air

The sources of aerial emission from the plant are a boiler for hot water production, the stockyards, the wastewater ponds, the wastewater irrigation system, and miscellaneous plant processes.

1.3 Resource consents

Silver Fern Farms currently holds five resource consents, the details of which are summarised in Table 1 below. Copies of all permits held by Silver Fern Farms during the period under review are included in Appendix I.

Table 1 Consents held by Silver Fern Farms in relation to their Waitotara site

Consent number	Purpose	Granted	Review	Expires
Water abstraction permits				
2261-3.1	To take groundwater from three bores in the vicinity of the Waitotara River for meat processing purposes	2016	2022	2034
10256-1.0	To take and use water from a spring for non-potable plant processes	2016	2022	2040
Water discharge permits				
5027-2	To discharge stormwater, defrost water and evaporative cooling water from a meat processing plant site into an unnamed tributary of the Waitotara River	2010	2022	2028
Air discharge permit				
4629-3.1	To discharge emissions into the air from various activities associated with meat processing operations	2017	2022	2034
Discharges of waste to land				
2260-3.1	To discharge to land wastewater by spray irrigation, stockyard solid wastes and stabilised sludges by spreading, from meat processing operations in the vicinity of the Waitotara River, including associated discharges to air	2017	2022	2034

1.4 Monitoring programme

1.4.1 Introduction

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

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

Monitoring at Silver Fern Farms' meat processing plant is carried out by both Silver Fern Farms and the Council. The purposes of monitoring are:

- to determine compliance with conditions on resource consents;
- to determine the effects on surface waters and groundwater, and air quality from the exercise of the resource consents; and
- to provide information for management of the wastewater disposal system.

The monitoring programme has developed with experience in operation of the plant. A comprehensive wastewater management plan has been prepared which specifically addresses monitoring of discharges to land.

1.4.2 Monitoring by Silver Fern Farms

Monitoring undertaken by Silver Fern Farms covers two main areas as described below.

Water abstraction

Silver Fern Farms monitors the volume of water abstracted. Telemetry of abstraction rate and of bore water level was commissioned on 24 September 2014. Groundwater level monitoring was instituted as a requirement of consent 9608, held by DR Wilson for abstraction of groundwater at a location across the Waitotara River for irrigation of pasture land.

Irrigation system management

The irrigation system is managed through monitoring and control of volumes of wastewater applied to 23 irrigation fields at the plant site and 65 runs across 19 paddocks at Longview Farm. Results of irrigation monitoring are reported to the Council annually.

In October 2009, Silver Fern Farms commenced monitoring the chemical composition of wastewater irrigated, on a monthly basis. This information is used mainly for more accurate measurement of nitrogen loadings on irrigation areas.

Soil of the irrigated areas is tested biennially to determine top-dressing requirements for pasture nutrients and maintenance of soil structure.

1.4.3 Monitoring by the Council

The consent monitoring programme for Silver Fern Farms' site undertaken by the Council consists of four primary components as described below.

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.

Review of Silver Fern Farms monitoring data

Monitoring data gathered by Silver Fern Farms are reviewed to determine compliance with resource consent conditions and to assess trends in water usage, and in wastewater volumes and land application.

Site inspections

An officer of the Council visits the Waitotara plant site at quarterly intervals. Inspections are made of the water abstraction system, stockyards, truck wash, processing facilities, boiler, blood and offal holding areas, and wastewater treatment and waste disposal systems. An off-site odour assessment is conducted in the vicinity of the plant and irrigation areas. Monitoring results, irrigation records and activities which may influence plant wastewater quality are discussed. The site neighbourhood is surveyed for environmental effects.

One inspection due to be undertaken in September 2021 was deferred to the 2021-2022 monitoring period due to COVID-19 restrictions.

Chemical sampling

The composition of wastewater irrigated and groundwater around irrigation areas is monitored quarterly. The wastewater is analysed to determine its organic and mineral strength, particularly for calculation of nitrogen loading on irrigation areas. Groundwater at seven locations, comprising six monitoring bores and a spring (Te Kiri o Rauru Spring), is analysed to determine the effects of irrigation on water quality, particularly on nitrate concentration.

Additional sampling was undertaken during the period under review, following receipt of results in breach of the drinking water standard for nitrates in groundwater samples from the Longview irrigation area.

One sampling round due to be undertaken in September 2021 was deferred to the 2021-2022 monitoring period due to COVID-19 restrictions.

2 Results

2.1 Water

2.1.1 Inspections

An officer of the Council carried out three routine inspections of Silver Fern Farms site during the 2020-2021 monitoring period. A fourth scheduled inspection was deferred to the following period due to the COVID restrictions in September 2021. The inspections took place on 15 December 2020, and 11 March and 22 June 2021. Each inspection by an officer of the Council is usually conducted in conjunction with a Silver Fern Farms employee.

Particular attention is given to the following items:

- water supply (bores and spring)
- wastewater treatment system
- land irrigation system
- by-product load-out and truck-wash areas
- chemical and fuel/oil storage areas
- stormwater/road drains
- domestic sewage disposal

Site management was generally found to be good and no significant environmental issues were noted. On 11 March, work was underway to relocate the pump shed to resolve issues with the spring water take. On 22 June, a project to improve bore security was underway, with fencing and concreting around the bores in progress.

2.1.2 Results of water abstraction monitoring

Process water for the site is drawn from three groundwater bores and a spring via separate pumps. Consent 2261-3.1 covers the abstraction from the groundwater bores. The daily volume limit is 1,300 m^3 (15.0 L/s), at a maximum rate of 20 L/s. Consent 10256-1.0 covers the abstraction from the spring, with a daily volume limit of 350 m^3 at a maximum rate of 4.4 L/s.

Under the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*, Silver Fern Farms was required by 10 November 2014 to take continuous measurements and keep daily record of volume taken, and thereafter supply by 31 July each year the record for the preceding 1 July to 30 June period.

Silver Fern Farms installed new meters for each of the water abstraction pumps, with telemetry to Council from 24 September 2014. Previously, weekly records had been kept. The meters were calibrated by a suitably qualified independent person.

Total daily abstraction volumes for the 2020-2021 monitoring period are shown in Figure 3.

The daily abstraction rate from the groundwater bores was within the limit of 1,300 m^3/d set on consent 2261-3.1, throughout the monitoring period.

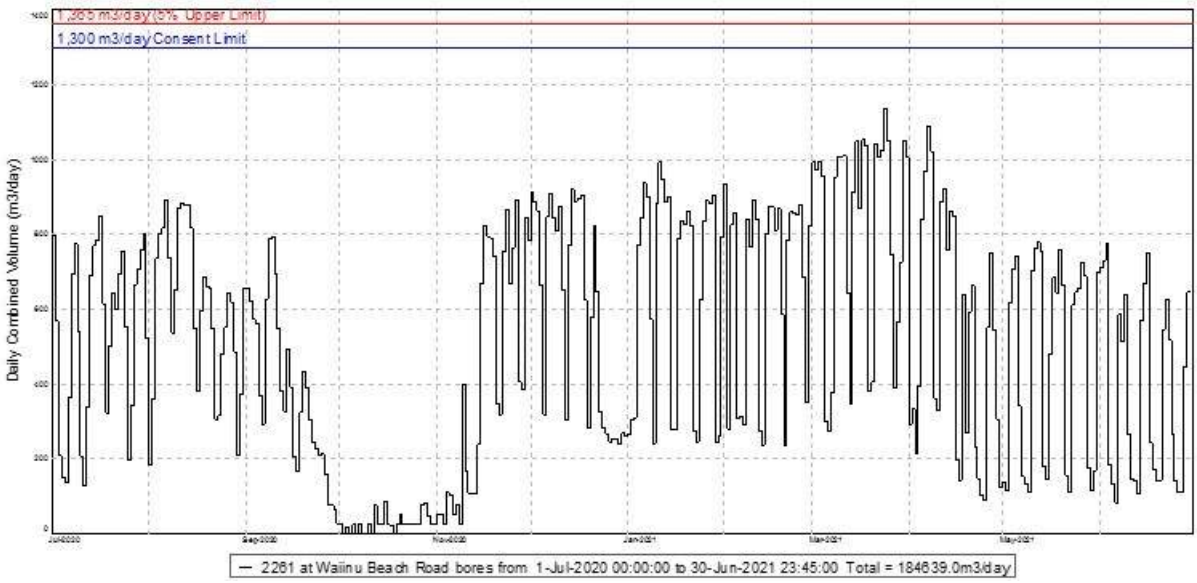

Figure 3 Daily abstraction volume m^3, October 2020 to September 2021

The total volume abstracted over the 12-month period ending 30 September 2021 was approximately 195,983 m^3, of which 171,303 m^3 was taken from the deep aquifers and 24,680 m^3 from the spring beside the Waitotara River.

Monthly maximum total instantaneous abstraction rates (L/s) for 2020-2021 are presented in Table 2, with the monthly average values for comparison. During the year under review the maximum instantaneous abstraction limit of 20 L/s was exceeded on a number of occasions. However, the flow meters have an accuracy of +/- 5%. Three flowmeters are grouped together, therefore error propagation methods are used to give a combined accuracy of +/- 9% for the total rate of take for the three flowmeters. This was exceeded on only three occasions through the 2020-2021 year. Due to problems with the telemetry of the data, which caused a delay in the receipt of the data by both Silver Fern Farms and the Council, no further action was taken on these occasions.

Table 2 Monthly average and maximum instantaneous groundwater abstraction rates 2020-2021

Month	Average daily abstraction (L/s)	Maximum total instantaneous abstraction (L/s)	Number of days per month total instantaneous abstraction limit exceeded	
			Over limit (20.0 L/s)	Over limit+9% (22.0 L/s)
October 2020	0.32	20.7	1	0
November 2020	4.52	24.9	11	1
December 2020	7.15	27.6	4	1
January 2021	7.43	20.2	4	0
February 2021	7.77	20.0	0	0
March 2021	9.37	19.8	0	0
April 2021	6.32	22.4	1	1
May 2021	5.16	20.1	1	0
June 2021	4.56	20.2	4	0
July 2021	3.98	20.2	3	0
August 2021	5.49	20.0	0	0

Month	Average daily abstraction (L/s)	Maximum total instantaneous abstraction (L/s)	Number of days per month total instantaneous abstraction limit exceeded	
			Over limit (20.0 L/s)	Over limit+9% (22.0 L/s)
September 2021	3.25	19.9	0	0

Spring

The maximum abstraction from the spring was no more than 253 m^3/day, within the consented limit of 350 m^3/day. Like the production bores, the pump has been configured to only pump up to the maximum consented rate. The rate of take exceeded the consented limit of 4.4 L/s on several occasions during the year under review (Table 3). An abatement notice was issued and the water take was shut down for repair from 2 March until 14 April 2021. This is discussed further in Section 2.3.

Table 3 Monthly average and maximum instantaneous spring water abstraction rates 2020-2021

Month	Average daily abstraction (L/s)	Maximum total instantaneous abstraction (L/s)	Number of days per month total instantaneous abstraction limit exceeded	
			Over limit (4.4 L/s)	Over limit+5% (4.6 L/s)
October 2020	0.51	2.22	0	0
November 2020	1.30	8.89	3	3
December 2020	1.79	3.33	0	0
January 2021	1.75	3.33	0	0
February 2021	1.86	13.33	3	3
March 2021	3.16	13.33	1	1
April 2021	0	0	0	0
May 2021	0	0	0	0
June 2021	0.40	2.22	0	0
July 2021	0.81	2.22	0	0
August 2021	0.51	2.22	0	0
September 2021	0.57	2.11	0	0

2.1.3 Results of discharge monitoring

2.1.3.1 Wastewater monitoring

Irrigation volumes

Records of the volume of wastewater irrigated at Silver Fern Farms' site have been supplied by Silver Fern Farms in accordance with the Wastewater Management Plan. The reported total volume irrigated for the 12 month period ending 30 September 2021 was approximately 111,379 m^3, a decrease of 20% from 2019-2020.

Some of the reasons put forward by Silver Fern Farms for the difference in the volumes abstracted and discharged are;

- Not all waste streams are directed to wastewater for disposal, for example domestic sewage;
- Loss of boiler-generated steam to atmosphere;

- Discharged as defrost or cooling water;
- Residual water held within storage tanks.

Wastewater composition

The results from chemical monitoring of wastewater irrigated are given in Table 4. Samples were taken from a tap that was installed on the irrigation line in the pump shed beside Pond 2 (site code IND003001). The results of monitoring of Pond 2 are used below, as this is the regular wastewater holding pond, with Pond 1 only used in the event of an emergency (i.e. a problem with the irrigators or plant which results in the need to hold wastewater for a period of time).

Table 4 Chemical monitoring results for the irrigation pond 2020-2021

Parameter		15 Dec 2020	11 Mar 2021	22 Jun 2021
Time	NZST	10:05	10:05	12:05
Temperature	°C	24.4	21.8	13.5
Conductivity, 25°C	µS/cm	1465	1567	1724
pH		7.1	7.2	7.3
Suspended solids	g/m^3	520	510	140
COD	g/m^3	900	850	310
Total nitrogen	g/m^3N	97	97	98
Ammonia nitrogen	g/m^3N	80	82	93
Nitrate + Nitrite	g/m^3N	< 0.02	< 0.02	0.03
Total phosphorus	g/m^3P	19.1	23	17.8
Sodium	g/m^3	106	130	104
Potassium	g/m^3	97	102	171
Calcium	g/m^3	27	33	31
Magnesium	g/m^3	5.6	6.9	7
SAR		4.9	5.4	4.4
KAR		3	2	4

In general, the strength of the irrigated wastewater, in terms of mineral and nitrogen content (conductivity and total nitrogen), was similar to that of the previous several monitoring years. The organic strength, represented by chemical oxygen demand (COD), showed some variation, which may be related to the amount of blood present at the time of sampling.

Nitrogen loading

Nitrogen loading on the irrigation areas is expressed as kilograms of nitrogen per hectare per year (kgN/ha/y). On the basis of the reported irrigation volumes and wastewater total nitrogen concentrations, as provided by Silver Fern Farms, the nitrogen loading for the fields on Longview Farm in 2020-2021 ranged from 10 to 233 kgN/ha/y. Adjacent to the plant nitrogen loading ranged from 14 to 47 kg/ha/y with no irrigation or solids disposal occurring on eleven fields. The loadings did not exceed the operational target of 300 kgN/ha/y on any field during the period under review.

2.1.3.2 Groundwater monitoring

The locations of the eight groundwater monitoring points (MPs) are depicted in Figure 1 and Figure 2 and described in Table 5. The four points near the plant are positioned approximately in a straight line running upslope (southward) from the Waitotara River towards the wetland which used to receive overflow from the wastewater holding ponds (pre 1999). The remaining points are downslope of the Longview Farm irrigation area.

MP1 is the spring from which water is drawn for stock and yard washing. The other five monitoring points (MP2- 6) are piezometer bores which are located at the periphery of irrigation areas.

MP7 and MP8 were installed in November 2019 to comply with an abatement notice requiring compliance with consent 2260-3.1. This consent required monitoring that included, the drilling and monitoring of bores down gradient of monitoring bore MP5 (GND0686). These bores were installed downslope of the Longview irrigation area specifically to assess the risk to the Wai-inu Beach municipal water supply.

Table 5 Groundwater monitoring sites

Name	Site Code	Location	Grid reference, NZTM	
MP1	GND1124	Spring N (downgradient) of Stage 1 irrigation area, adjacent to Waitotara River	1747905	55892552
MP2	GND000097	Piezometer, N (downgradient) corner of Stage 2 irrigation area	1748176	5588876
MP3	GND000098	Piezometer, S (upgradient) corner of Stage 2 irrigation area	1748231	5588618
MP4	GND000099	Piezometer, NE (downgradient) of Stage 3/4 irrigation area, adjacent to wetland	1748351	5588498
MP5	GND0686	Piezometer, W (downgradient) of Longview irrigation area	1749098	5586785
MP6	GND2510	Piezometer, SE (downgradient) of Longview irrigation area	1750792	5586905
MP7	GND3070	Piezometer, W (downgradient) of Longview irrigation area	1748863	5587001
MP8	GND3071	Piezometer, W (downgradient) of Longview irrigation area and MP5. 180 m upslope of the Wai-inu Beach municipal water supply bore.	1748921	5586644

The summary of chemical analysis results for the quarterly samples taken from the eight groundwater monitoring points is given in Table 6 and Table 7. During the period under review, additional samples were collected from bores at the Longview irrigation area in response to elevated nitrate and *E. coli* levels in June 2021. A fourth scheduled sampling round was deferred to the following period due to COVID-19 restrictions in September 2021. No samples were obtained from MP7 during the period under review due to the bore being dry on all sampling occasions.

Table 6 Water quality results for monitoring bores at Silver Fern Farms Waitotara from October 2020 to September 2021

Date	Site	Water level	Temperature	Conductivity 25°C	pH	COD	Ammonia	Nitrate + Nitrite	Chloride	Calcium	Magnesium	Potassium	Sodium
		m	°C	µS/cm		g/m^3	g/m^{3}N	g/m^{3}N	g/m^3	g/m^3	g/m^3	g/m^3	g/m^3
15 Dec 2020	MP1	-	17.1	662	7.5	6	5.8	3.5	48	62	8	23	32
	MP2	2.10	16.3	611	7.5	8	< 0.01	8.1	23	73	6.2	35	16.3

Date	Site	Water level	Temperature	Conductivity 25°C	pH	COD	Ammonia	Nitrate + Nitrite	Chloride	Calcium	Magnesium	Potassium	Sodium
		m	°C	µS/cm		g/m³	g/m³N	g/m³N	g/m³	g/m³	g/m³	g/m³	g/m³
	MP3	3.01	15.6	562	7.6	12	< 0.01	2.8	24	74	4.7	19.1	21
	MP4	5.08	16.1	496	7.7	10	< 0.01	11.5	27	64	4.2	5.2	25
11 Mar 2021	MP1	-	16.8	606	7.5	10	5.0	2.9	45	56	7.2	24	34
	MP2	3.02	16.2	629	7.6	10	< 0.01	6.5	18.5	80	7	36	18.3
	MP3	3.03	15.8	582	7.6	14	0.06	2.0	25	75	5.1	17.2	29
	MP4	6.00	15.4	478	7.6	< 6	< 0.01	5.2	21	58	3.8	8.1	33
22 Jun 2021	MP1	-	15.5	623	7.4	< 6	4.7	3.5	46	63	9	27	38
	MP2	3.03	15.0	621	7.5	8	< 0.10	3.8	22	82	7.4	44	21
	MP3	3.04	15.3	571	7.6	7	0.08	2.7	25	75	5.4	17.9	36
	MP4	6.01	15.0	481	7.6	11	0.01	3.5	22	62	4.4	7.3	36

Table 7 Water quality results for monitoring bores on the Longview irrigation area from October 2020 to September 2021

Date	Site	Water level	Temperature	Conductivity 25°C	pH	COD	Ammonia	Nitrate + Nitrite	Chloride	Calcium	Magnesium	Potassium	Sodium	*E. coli*
		m	°C	µS/cm		g/m³	g/m³N	g/m³ N	g/m³	g/m³	g/m³	g/m³	g/m³	MPN/ 100 mL
15 Dec 2020	MP5	5.01	16.1	610	7.7	8	< 0.010	8	31	85	9.4	1.75	22	1
	MP6	6.04	15.4	1049	7.4	< 6	< 0.010	3.4	142	145	12.4	3.3	48	N/R
	MP8	4.10	16.1	750	7.5	< 6	< 0.010	7.4	45	97	11.5	2.3	38	<1
11 Mar 2021	MP5	5.01	16.2	602	7.6	< 6	< 0.010	8.6	28	85	9.7	1.62	23	<1
	MP6	6.04	15.1	1089	7.4	14	< 0.010	3.3	160	144	12.6	3.5	56	N/R
	MP8	4.10	16	745	7.6	< 6	< 0.010	8	42	96	12	2.4	40	3
22 Jun 2021	MP5	5.03	14.8	664	7.6	< 6	< 0.10	16.1	38	97	11.4	1.98	26	1120
	MP6	6.06	14.4	1134	7.2	16	0.019	2.8	179	191	15	4.2	65	N/R
	MP8	5.02	14.2	731	7.5	< 6	< 0.10	7.3	39	101	13	2.4	42	16
2 Jul 2021 (follow -up)	MP5	N/R	14.9	801	7.4	<6	<0.10	27	49	115	14.4	2.1	29	<1
	MP6	N/R	14.2	1183	7.4	<6	0.01	2.8	195	175	15.5	3.6	61	6
	MP8	N/R	14.7	733	7.5	<6	<0.10	7.4	41	104	13.6	2.4	40	<1

N/R = not recorded

The parameters of most interest with regard to the operation of the wastewater disposal system and the monitoring of its effects on the surrounding environment are the nitrogen species (nitrate and ammonia), the organic strength (COD), and the conductivity. Figures 4, 5 and 6 show how the levels of conductivity,

ammonia and nitrate, respectively, have varied through time (January 1994 to January 2021) for groundwater at the six MPs.

The spring water at MP1 is likely to be subject to the effects of activities at the surface, such as local farming, and particularly the irrigation of wastewater by Silver Fern Farms. In 2020-2021, the nitrate concentration did not show significant seasonal variation, with low levels of between 2.9 and 3.5 g/m^{3}N (Figure 7).

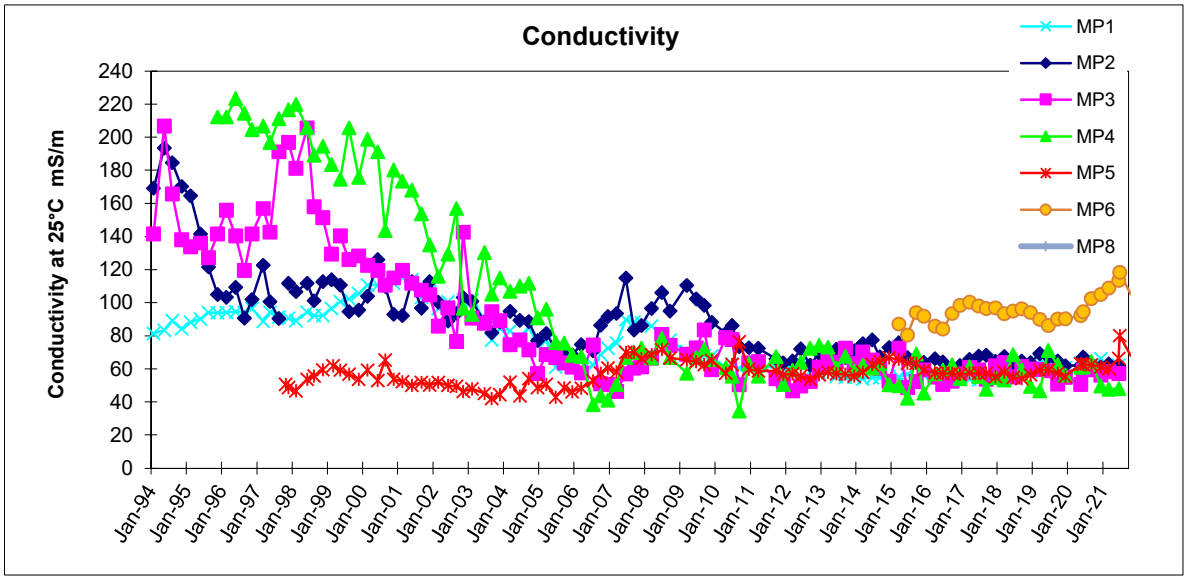

Figure 4 Conductivity at groundwater monitoring points, 1994-2021

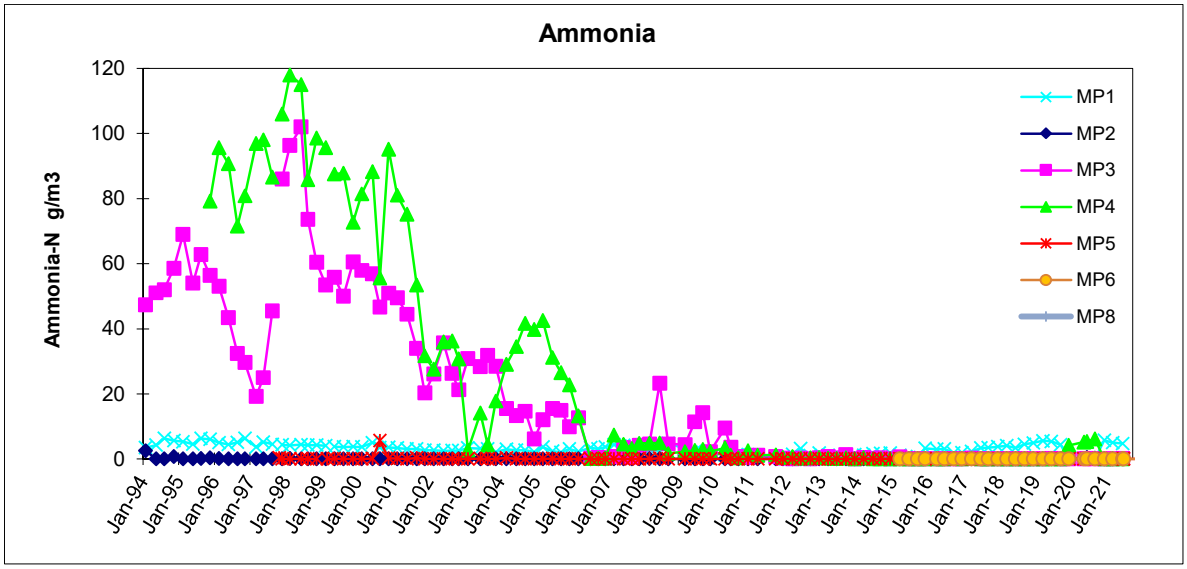

Figure 5 Ammonia at groundwater monitoring points, 1994-2021

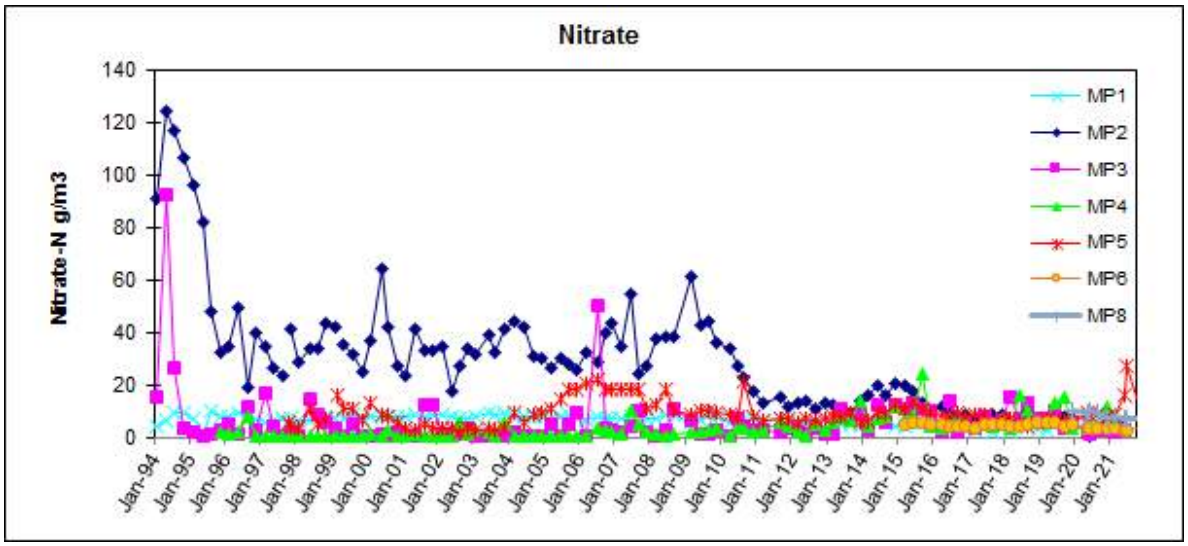

Figure 6 Nitrate at groundwater monitoring points, 1994-2021

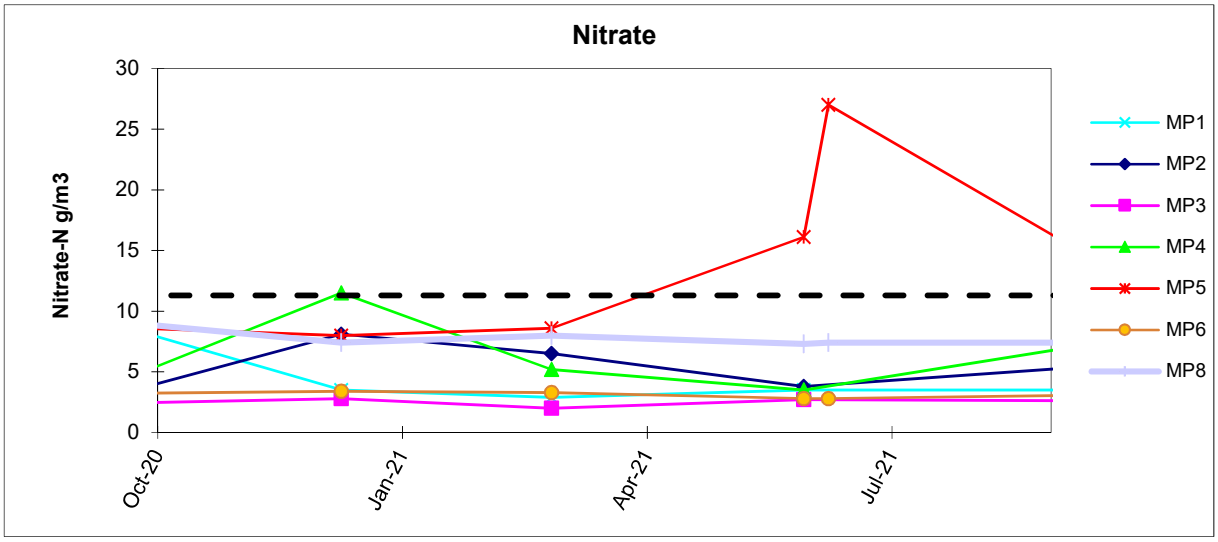

Figure 7 Nitrate at groundwater monitoring points in the 2020-2021 monitoring year. The black line represents the drinking water standard for nitrate.

The groundwater quality at MP2 appears to respond relatively quickly to changes in wastewater loading on the Stage 2 irrigation area. This is consistent with rapid wastewater infiltration through approximately 2 m of sandy soil to the underlying water table. The levels of ammonia present are very low, indicating almost complete nitrification in aerobic soil. The significant fall in nitrate concentration during the 2010-2011 monitoring period in MP2, was in response to reduced irrigation volumes, and since has ranged between about 10 and 20 g/m^{3}N. During the current monitoring period levels in MP2 remained below 10 g/m^{3}N (Figure 7).

At MP3, up-gradient of stage 2 area, the effects of wastewater disposal via the old soakage trench and wetland have been apparent. The improvement in water quality is attributed to the soakage trench and wetland no longer being used for discharge. The reduction is also consistent with the movement of wastewater through saturated soil, such as would occur below a soakage trench or wetland. After development of stage IV irrigation area in January 2013, nitrate concentration has lifted, with seasonal variation from 2 to 15 g/m^{3}N, and generally peaking in winter. The nitrate concentration at MP3 over the monitoring period has remained below 5 g/m^{3}N.

In the past, the effects of wastewater disposal have been recorded at MP4, the site closest to the wetland. The concentrations of several groundwater parameters (sodium, potassium, alkalinity and chloride) were similar to those in the wastewater itself, until after disposal of wastewater to the area ceased in 1999. Subsequently, nitrate concentrations were generally low, with a gradual increase after the development of stage 4 irrigation area in January 2013. Nitrate concentrations during the period under review exceeded the NZ drinking water standards on 15 December 2020.

Although the nitrate concentrations have decreased substantially in MP3 since the early 1990s, the more recent increase is a cause for concern and represents an adverse impact on the groundwater quality in the vicinity of the plant. In the last three monitoring years, there were breaches of the NZ drinking water standard in bores MP3 and MP4. Although wastewater has not been applied to these areas since 2019, stockyards solids and stabilised sludge are still applied to this area.

Groundwater quality at MP5, downslope of the western side of Longview Farm irrigation area, was monitored for two years before irrigation commenced there in January 1999, and showed considerable variation in nitrate concentration (4 to 16 g/m^{3}N) during that period. During the period under review ranged between 8 and 27 g/m^{3}N, with a large spike recorded in June and July 2021.

MP6 was established on 1 February 2015 in the new irrigation area on the south-eastern side of Longview Farm, where irrigation commenced in September 2012. Conductivity was higher than at the other groundwater monitoring sites, reflecting closer proximity to the sea. Nitrate concentration has remained moderately low and steady at between 2.8 to 6.0 g/m^{3}N.

Bore MP7 did not intercept water when it was drilled in 2019 and has remained dry or with insufficient water to collect a sample during the period under review. Monitoring in this bore will continue to determine whether seasonal fluctuations in water level occur. Bore MP8 is sampled monthly by Silver Fern Farms, whom recorded nitrate concentrations of up to 11.4 g/m^{3}N, in exceedance of the drinking water standard of 11.3 g/m^{3}N.

2.1.3.3 Te Kiri o Rauru spring

When consent was sought from STDC in the 2011-2012 monitoring year to provide for extension to the irrigation area on Longview Farm, consultation with tangata whenua, Ngaa Rauru Kiitahi, raised a concern about potential effect of the irrigation on a sacred spring, Te Kiri o Rauru, that is situated at the coast approximately 1,350 m from the nearest part of the wastewater application area.

In response, Silver Fern Farms undertook to monitor the quality of water from the spring. Three monthly sampling, for turbidity, total coliforms and total nitrogen analysis, was initiated at the site identified by Te Kaahui o Rauru representative Dallas McLeod (Site Code GND2531). The spring constitutes seeps at the base of an 8-10 m high shellrock face over a distance of about 100 m at the shore.

To provide comprehensive background information, a sample of the spring taken by Silver Fern Farms on 24 September 2012 was analysed by the Council for a wide range of physicochemical parameters. Another sample, taken on 16 December 2012 about 30 m west of the first sampling site, which had been covered by sand, was analysed by Council for microbiological quality. During the period under review Silver Fern Farms collected samples approximately quarterly. A summary of results is given in Table 8 below.

Table 8 Chemical composition of Te Kiri o Rauru Spring

Parameter		Range 2020-2021	Range 2019-2020
Total nitrogen	g/m^3	<5	<5
Total coliforms	Cfu/100ml	<1-50 (16)	<1-7 (2)
Turbidity	NTU	0.1-2.8 (1)	0.15-0.55 (0.33)

Average of all samples is shown in brackets.

Sample results showed no indication that the spring had been influenced by the wastewater irrigation, with low total coliform and total nitrogen values in all samples, except on one occasion when low flows led to pooled water being sampled. This sample had elevated turbidity and bacterial counts. Other than on this occasion, water quality was similar to 2019-2020.

2.2 Air

2.2.1 Inspections

The sources of aerial emission from the plant are a boiler for hot water production, the stockyards, the wastewater ponds, the wastewater irrigation system, and miscellaneous plant processes. Routine inspections of the site were conducted on three occasions, as described in section 2.1.1: 15 December 2020, and 11 March and 22 June 2021. A fourth scheduled inspection was deferred to the following period due to the COVID restrictions in September 2021.

In general the site was found to be well managed with regard to odours. Odours were not noticeable beyond the site boundary during any of the inspections.

2.3 Investigations, interventions, and incidents

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

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

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

Table 9 below sets out details of any incidents recorded, additional investigations, or interventions required by the Council in relation to Silver Fern Farms activities during the 2020-2021 period. This table presents details of all events that required further investigation or intervention regardless of whether these were found to be compliant or not.

Table 9 Incidents, investigations and interventions summary table

Date	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
Nov, Dec 2020 and April 2021	Maximum rate of water take was breached by more than 5% on three occasions.	N	None	Offending was relatively minor and issues with the telemetry resulted in the consent holder and TRC not being notified of the events in timely manner. The telemetry issues have since been corrected.
13/11/2020	Monitoring data showed that the instantaneous abstraction rate was in breach of the maximum rate permitted under consent 10256-1.0	N	None	This occurred overnight due to pipeline failure. It was remedied by shutting down the pump immediately the following morning until repairs could be made. Therefore no enforcement action was considered necessary on this occasion.
24/02/2021	Monitoring data showed that the instantaneous abstraction rate was in breach of the maximum rate permitted under consent 10256-1.0	N	14 day letter followed by an Abatement Notice.	A temporary fix was applied, while investigations were made. Upon the failure of the temporary fix, the water take was shut down until a permanent solution could be applied.
22/06/2021 and 02/07/2021	Results of sampling undertaken on 22 June 2021 showed elevated nitrate and E. coli in monitoring bores	Y	None	Resampling was undertaken, which showed nitrate levels had further increased. Sampling undertaken by STDC showed that the Wai-inu Beach municipal water supply was not affected. Council is seeking a review of consent conditions to include a contaminant limit for nitrate in groundwater.

During the period under review, the maximum rate of water take from the three bores (Consent 2261-3.1) was breached by more than 5% on three occasions. At the time the exceedances occurred, ongoing issues

with the telemetry equipment prevented the data from being received in real time by both Silver Fern Farms and the Council. Therefore no further action was taken with respect to these exceedances.

On 14 November 2021, abstraction monitoring data showed that the water take from the spring had breached the maximum instantaneous abstraction rate permitted by consent 10256-1.0 overnight. Discussion with the consent holder determined that this had been detected and the pump shut down prior to the start of the workday, until repairs to a burst pipe could be made. No enforcement action was considered necessary because of the rapid action undertaken by the consent holder and that the incident resulted due to failure of infrastructure.

On 24 February 2021, abstraction monitoring data again showed that the water take from the spring had breached the maximum instantaneous abstraction rate permitted by consent 10256-1.0. A 14 day letter was issued requiring an explanation to be provided by the consent holder. Investigations showed that this was caused by subsidence of the pump shed, causing pipes to break. Water was then pumped at the maximum possible rate. A temporary fix to the broken pipe was applied on the same day. On 1 March 2021, further subsidence caused this to recur. The water take was shut down until a permanent repair could be made by replacing the pump shed in a new location. An abatement notice was issued requiring the consent holder to comply with the conditions of consent 10256-1.0. This work was completed and the water abstraction recommenced on 11 June 2021.

On 22 June 2021, routine sampling of the monitoring bores at Silver Fern Farms Waitotara and Longview Farms was undertaken. Upon receipt of results, it was noted that bore MP5 had recorded elevated nitrate concentrations of 16 g/m^3 and *E. coli* of 1,120 MPN/100 mL. Bore MP6 also recorded an elevated COD of 16 g O_2/m^3. Due to the proximity of these bores to the Wai-inu Beach municipal water supply, STDC was notified and resampling of bores on Longview farm was undertaken on 2 July 2021. This found further elevation to the nitrate concentrations in bore MP5 to 27 g/m^3, while E. coli concentrations had dropped substantially. The nitrate levels at bore MP8, down-gradient of MP5, did not record nitrate concentrations in excess of the NZ drinking water standards, and nitrate was not detected in the Wai-inu Beach municipal water supply during sampling by STDC. No further action was taken, although routine monitoring by both Silver Fern Farms and the Council will continue. It is noted that there has been episodic elevated nitrate and *E. coli* concentrations in these monitoring bores.

3 Discussion

3.1 Discussion of site performance

Inspections of Silver Fern Farms' site during the 2020-2021 review period found that the site was generally well managed, although a number of issues did arise during the year under review.

The rate of take from both the bores and spring were exceeded on a few occasions during the year under review. These exceedances were short lived and relatively minor. It is unlikely that any environmental impact occurred as a result of these events. Silver Fern Farms responded to the events and have undertaken work to prevent future non-compliance.

With regard to the discharge of stormwater and wastewater, the disposal systems were found to be operated and maintained in a satisfactory manner over the majority of 2020-2021 period. However, the nitrate concentrations in the groundwater on the Longview wastewater irrigation area continue to cause concern as discussed under the next section detailing the environmental effects of exercising the consent (Section 3.2).

During the monitoring year, the *E. coli* and nitrate levels in bores MP5 and MP8 (down-gradient of MP5), combined with the proximity to the Wai-inu Beach municipal water supply bore and the application of synthetic nitrogen fertiliser at Longview Farm, led to the Council invoking condition 6 of consent 2260-3.1. This required Silver Fern Farms to review their Irrigation Management Plan (IMP) within two months, with a view to reducing nitrogen loadings in the area. An extension was granted to allow Silver Fern Farms to consult with Longview Farm on changes to the IMP. During this time, the ponding at Longview was also noted. Silver Fern Farms were subsequently asked to review the adequacy and application of measures to prevent and mitigate ponding of wastewater in their irrigation areas as a part of the review of the IMP. A further extension of time was granted to allow this to be incorporated into the review. Silver Fern Farms were asked to ensure that operators were complying with the requirements of the IMP and to maintain records to demonstrate compliance with the IMP. A plan was received on 25 February 2021, seven months following the review being invoked. A further update and response was received on 28 April 2021. However, Council still have concerns about the adequacy of this plan, particularly the lack of mitigation measures proposed by the plan.

In the 2018-2019 period Silver Fern Farms had been directed to include measures to prevent further increases to groundwater nitrate levels in bores MP3 and MP4 in the annual review of the Integrated Management Plan. Sampling by both the Council and Silver Fern Farms showed that during 2019-2020, nitrate concentrations in these bores decreased substantially from 2018-2019. However, a spike in nitrate concentrations in MP4 was again recorded during the period under review.

Nitrogen loadings to irrigation areas remained below the operational target of 300 kg/ha/y during the 2020-2021 monitoring period.

3.2 Environmental effects of exercise of consents

Effects on groundwater in the vicinity of this site were varied, but have shown significant improvement with reference to historical results. This has mostly been addressed through the extension of the irrigation disposal system, which reduced the nitrogen loadings. Despite the improvement that has occurred since the early 1990s, more recent results show increasing nitrate concentrations at sites MP3 and MP4 as shown in Figure 7. Although wastewater has not been applied to these areas since 2019, stockyards solids and stabilised sludge are still applied to this area. Monitoring of the new bore, MP8, found *E. coli* in the groundwater. Additionally nitrate concentrations in this bore were recorded by the Council as up to 10 g/m^3N, and monitoring by Silver Fern Farms recorded concentrations as high as 11.4 g/m^3N. During the period under review, nitrate concentrations of up to 27 g/m^3N have been recorded in the up gradient bore

MP5. The high nitrate concentrations have exceeded the drinking water standard of 11.3 g/m^{3}N. This is a significant cause for concern given proximity to the Wai-inu Beach municipal water supply bore. The Council is continuing to work with the consent holder to investigate the causes of the elevated nitrates. In addition to this a recommendation is included in this report (Section 3.6), to exercise the optional review of consent 2260-3.1 to ensure that the consent conditions are adequate to deal with any adverse environmental effects arising from the exercise of the consent.

Monitoring of Te Kiri o Rauru Spring, situated over a kilometre down gradient of the irrigation extension, to satisfy concerns of tangata whenua continued in 2020-2021 and indicated no impact to the spring.

No adverse effects on the surrounding environment were recorded as a result of the discharge of stormwater or the water abstraction from Silver Fern Farms Waitotara site in the 2020-2021 period.

In terms of environmental effects from the discharge of emissions to air, localised odours were noted during inspections. Odours were not objectionable nor were they detected beyond the boundary. No complaints were received from residents at the Wai-inu Beach Settlement during the period under review.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Tables 10-14.

Table 10 Summary of performance for consent 2260-3.1

Purpose: ***To discharge to land wastewater by spray irrigation, stockyard solid wastes and stabilised sludge by spreading, from meat processing operations in the vicinity of the Waitotara River, including associated discharges to air***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Stockyards solid waste discharge rate not to exceed 28 m^3/7 days, wastewater not to exceed 1,700 m^3/day	Site inspections and data provided	Yes
2. Discharge to occur in agreed disposal areas	Site inspections and information provided	Yes
3. No offensive or objectionable odour beyond the boundary of the property	Site inspections and complaints register	Yes
4. Discharge not to result in spray drift beyond the boundary of the property	Site inspections and complaints register	Yes
5. Preparation of Integrated Management Plan (IMP)	Plan received with consent application 26/12/2015	Yes
6. IMP to be reviewed annually by 31 December; or upon two months' notice by either party	Liaison with consent holder	Review invoked, plan received 28 April 2021
7. Designated officer to manage spray irrigation system according to IMP	Liaison with consent holder	Yes

Purpose: *To discharge to land wastewater by spray irrigation, stockyard solid wastes and stabilised sludge by spreading, from meat processing operations in the vicinity of the Waitotara River, including associated discharges to air*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
8. Consent holder to undertake a monitoring programme to monitor risk to Wai-inu Beach municipal water supply	Received	Yes
9. Adopt best practicable option to prevent or minimise adverse environmental effects	Site inspections and sampling	No – ongoing impact on groundwater
10. Sodium adsorption ratio not to exceed 15	Sampling	Yes
11. Discharge not to result in wastewater reaching surface water	Site inspections and sampling	Yes
12. Contaminants not to be discharged within certain areas	Inspection	Yes
13. Discharge not to occur within 20 m of new roads	No new roads in area	N/A
14. Consent holder to keep records of rate and volume of discharge	Records provided	Yes
15. Council and STDC to be notified if an event occurs that may have adverse effect on Wai-inu Beach municipal water supply	No events occurred	Yes
16. Review of consent	Not scheduled for consideration during year under review. Next optional review June 2022.	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Good** **High**

N/A = not applicable

Table 11 Summary of performance for consent 2261-3.1

Purpose: *To take ground water from three groundwater bores in the vicinity of the Waitotara River for meat processing purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on maximum abstraction rate	Metering by consent holder and review of records by Council	No

Purpose: *To take ground water from three groundwater bores in the vicinity of the Waitotara River for meat processing purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
2. Labelling of bores	Site inspection by Council	Yes
3. Installation and operation of monitoring equipment	Site inspection and receipt of monitoring records.	Yes
4. Keeping of monitoring records	Receipt of records by Council	Yes
5. Certification of monitoring equipment	Receipt of certificate	Yes
6. Actions upon breakdown of monitoring equipment	Notification received	Yes
7. Installation of groundwater level monitoring device in dedicated bore before 31 August 2017	Inspection by Council. Extension granted until 31 October 2017	Yes
8. Installation of groundwater level monitoring devices in abstraction bores before 30 August 2017	Inspection by Council. Extension granted until 31 October 2017	Yes
9. Access to monitoring equipment	Site inspection	Yes
10. Adoption of best practicable option and efficient use	Site inspections and liaison with consent holder	Yes
11. Backflow protection	Records provided and site inspection	Yes
12. Provisions of triennial report on sustainability of aquifer	Received 24 September 2020	Yes
13. Optional review provision re environmental effects	Not scheduled for consideration during year under review. Next optional review June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**Good**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 12 Summary of performance for consent 4629-3.1

Purpose: *To discharge emissions into the air from various activities associated with meat processing operations*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Emissions to be generally of the nature and scale described in the application	Site inspections	Yes
2. Best practicable option to prevent or minimise adverse effects	Site inspections	Yes

Purpose: *To discharge emissions into the air from various activities associated with meat processing operations*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
3. Discharge not to give rise to offensive or objectionable odour at or beyond the site boundary	Site inspections, complaints register	Yes
4. Discharge to be smoke free	Site inspections	Yes
5. Review of consent conditions	Not scheduled for consideration during year under review. Next optional review June 2022	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 13 Summary of performance for consent 5027-2

Purpose: *To discharge stormwater, defrost water and evaporative cooling water from a meat processing plant site into an unnamed tributary of the Waitotara River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practicable option	Site inspections and chemical sampling	Yes
2. Limits on catchment area of site	Site inspections	Yes
3. Containment of hazards	Site inspections	Yes
4. Limits on pH, oil and grease and suspended solids	Site inspections and chemical sampling	Yes
5. Discharge shall not give rise to effects on stream beyond mixing zone	Site inspections and chemical sampling	Yes
6. Provide and maintain a contingency plan	Council records and site inspections. Plan updated 30 November 2021	Yes
7. Provide and maintain a stormwater management plan	Council records and site inspections. Plan updated 30 November 2021	Yes
8. Notification on changes on site	Not required during monitoring period	N/A
9. Review of consent conditions	Not scheduled for consideration during year under review. Next consideration June 2022	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 14 Summary of performance for consent 10256-1.0

Purpose: *To take and use water from a spring for non-potable plant purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on maximum abstraction rate and volume	Metering by consent holder and review of records by Council	No – rate and volume exceeded a couple of times
2. Installation and operation of monitoring equipment	Site inspection and receipt of monitoring records	Yes
3. Certification of monitoring equipment	Receipt of certificate	Yes
4. Actions upon breakdown of monitoring equipment	Notification received	Yes
5. Access to monitoring equipment	Site inspection	Yes
6. Keeping of monitoring records	Receipt of records by Council	Yes
7. Lapse of consent	Consent exercised	N/A
8. Optional review provision re environmental effects	Not scheduled for consideration during year under review. Next optional review June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**Good**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 15 Evaluation of environmental performance over time

Year	Consent no	High	Good	Improvement required	Poor
2009-10	2260-2	1	-	-	-
	2261-2	1	-	-	-
	4629-2	1	-	-	-
	5027-1	1	-	-	-
2010-11	2260-2	1	-	-	-
	2261-2	1	-	-	-
	4629-2	1	-	-	-
	5027-2	1	-	-	-
2011-12	2260-2	1	-	-	-
	2261-2	1	-	-	-
	4629-2	1	-	-	-
	5027-2	1	-	-	-
2012-14	2260-2	1	-	-	-
	2261-2	1	-	-	-
	4629-2	1	-	-	-

Year	Consent no	High	Good	Improvement required	Poor
	5027-2	-	1	-	-
2014-15	2260-2	-	1	-	-
	2261-2	-	-	1	-
	4629-2	1	-	-	-
	5027-2	1	-	-	-
2015-16	2260-2	-	1	-	-
	2261-2/3	-	-	1	-
	4629-2	1	-	-	-
	5027-2	1	-	-	-
2016-17	2260-3	-	1	-	-
	2261-3	1	-	-	-
	4629-3	-	1	-	-
	5027-2	1	-	-	-
	10256-1	1	-	-	-
2017-18	2260-3	-	1	-	
	2261-3	-	1	-	-
	4629-3	1	-	-	-
	5027-2	1	-	-	-
	10256-1	1	-	-	-
2018-19	2260-3	-	-	1	-
	2261-3	-	1	-	-
	4629-3	1	-	-	-
	5027-2	1	-	-	-
	10256-1	1	-	-	-
2019-2020	2260-3	-	-	1	-
	2261-3	-	1	-	-
	4629-3	1	-	-	-
	5027-2	1	-	-	-
	10256-1	1	-	-	-
2020-2021	2260-3	-	1	-	-
	2261-3	-	1	-	-
	4629-3	1	-	-	-
	5027-2	1	-	-	-
	10256-1	-	1	-	-
Totals		30	11	3	0

During the year, Silver Fern Farms demonstrated an overall good level of environmental and high level of administrative performance with the resource consents as defined in Section 1.1.4.

3.4 Recommendations from the 2019-2020 Annual Report

In the 2019-2020 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at Silver Fern Farms Ltd in the 2020-2021 year continue at the same level as in 2019-2020.
2. THAT should there be issues with environmental or administrative performance in 2020-2021, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the annually reviewed integrated land management plan considers how to further prevent increases to nitrate in groundwater.
4. THAT the new bore MP7 should continue to be monitored to detect whether water is present in this bore seasonally and that should water be present, physicochemical monitoring should be undertaken.

Recommendations 1, 2 and 4 were implemented. Additional sampling was undertaken in the bores on Longview Farm as required in response to elevated *E. coli* and nitrate concentrations.

Recommendation 3 was not fully addressed by the review of the ILMP undertaken by Silver Fern Farms, but was addressed in a letter responding to the feedback provided on the first iteration of the plan received.

3.5 Alterations to monitoring programmes for 2021-2022

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

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

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

It is proposed that for 2021-2022 that the monitoring programme for Silver Fern Farms remains largely unchanged from that of 2020-2021. Continued surveillance of the new bore MP7 will determine whether water is present in this bore seasonally; and should water be present in this bore then monitoring will be undertaken.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site in question. The Council reserves the right to adjust this baseline programme should the need arise if potential or actual non-compliance is determined at any time during 2021-2022.

3.6 Exercise of optional review of consent

Resource consent 2260-3.1 provides for an optional review of the consent in June 2022. Condition 16 allows the Council to review the consent, for the purposes of:

a) ensuring that consent conditions are adequate to deal with any adverse environmental effects arising from exercise of the consent; AND/OR
b) setting limits for contaminants if concentrations of that contaminant are increasing at a rate that could make it unsuitable for any existing potential use; AND/OR
c) requiring any data collected in accordance with the conditions of this consent to be transmitted directly to the Council.

Based upon the results of monitoring in the period under review, and in previous years as set out in earlier compliance monitoring annual reports, it is considered that there are grounds to exercise the review option.

The nitrate concentrations in the groundwater in the vicinity of the Longview irrigation area appear to be increasing in recent times, with concentrations of up to 27 g/m^3N recorded in July 2021. This is considered to be an adverse environmental effect which is not adequately addressed by the current consent conditions. Additionally, this effect has the potential to negatively impact upon the Wai-inu Beach municipal water supply. Currently the primary mechanism for addressing this is via the Integrated Land Management Plan. Given the time taken for the recent review to be undertaken, and that Council still considers unaddressed concerns remain with this plan, more stringent consent conditions are required. These are likely to include specifying limits for contaminants of concern in accordance with condition 16 (b).

Daily wastewater discharge volumes are collected in accordance with condition 14 of this consent. These are currently available to the consent holder via their SCADA system and supplied to the Council annually. Correspondence from the consent holder dated 28 April 2021 demonstrates reluctance to supply this data in real time as there is no current consent requirement for this. Council considers that more timely supply of this information would assist to provide timelier monitoring and addressing of the issues associated with the exercise of this consent. Therefore in accordance with condition 16 (c) of consent 2260-3.1, Council would like to include the direct transmission of wastewater discharge volumes in a format suitable for providing a 'real time' record over the internet in the consent review.

Specific conditions to be added or amended:

- Addition of a condition defining and prohibiting ponding of wastewater should be added, separate from the requirement of the ILMP to address ponding. The ILMP should still require that the consent holder considers how to comply with this condition.
- Addition of a condition to specifically address remediation measures as currently required to be addressed in the ILMP by condition 5 (m). This should specifically require that remediation measures are required to address both short-term events and long term trends in contaminant levels to retain suitability of the area (including both groundwater and soil) for existing potential uses. A suggested mechanism for achieving this is via a remediation plan for the site and irrigation areas (including triggers for action, actions (including management and investigation actions), target outcomes and interim triggers and outcomes). This plan should be linked to irrigation management in the ILMP as specified under condition 5 (e). However, Council considers that this is currently inadequately covered in the ILMP and therefore suggests that this should be a separate plan to reinforce the importance of this component.
- An amendment to condition 15 extending the requirement to notify STDC of potential impacts upon the Wai-inu Beach municipal water supply to include chronic long term trends in contaminants as well as discrete events.
- Addition of a condition setting a contaminant limit for nitrate concentrations in groundwater, at the maximum allowable level permitted in the NZ drinking water standards. Should these standards

change, a plan to reduce nitrate concentrations within 5 years (or agreed timeframe) should be prepared. Any plan should be supplied and certified by Council within 6 months of a change occurring to the NZ drinking water standards.

- Addition of a condition specifying limits on COD, as a contaminant of concern in the wastewater irrigation areas. This condition will also require the consent holder to send samples to an accredited laboratory or to undertake inter-laboratory comparisons with the Council.
- An amendment to condition 14 to require daily discharge volumes to be supplied to Council in a format suitable for providing a 'real time' record over the internet as per condition 16 (c).

Consents 2261-3.1, 4629-3.1, 5027-2 and 10256-1.0 also provide for an optional review of the consents in June 2022. Based on the results of monitoring in the year under review, and in previous years as set out in earlier annual compliance monitoring reports, it is considered that there are no grounds that require a review to be pursued.

4 Recommendations

1. THAT in the first instance, monitoring of consented activities at Silver Fern Farms Ltd in the 2021-2022 year continue at the same level as in 2020-2021.
2. THAT should there be issues with environmental or administrative performance in 2021-2022, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the annually reviewed integrated land management plan considers how to further prevent increases to nitrate in groundwater.
4. THAT the new bore MP7 should continue to be monitored to detect whether water is present in this bore seasonally and that should water be present, physicochemical monitoring should be undertaken.
5. THAT the option for a review of resource consent 2260-3.1 in June 2022, as set out in condition 16 of the consent, be exercised, on the grounds of ensuring that consent conditions are adequate to prevent adverse environmental effects from occurring.
6. THAT the option for a review of resource consents 2261-3.1, 4629-3.1 5027-2 and 10256-1.0 in June 2022, as set out in consent conditions, not be exercised, on the grounds that current conditions are adequate.

Glossary of common terms and abbreviations

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

BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
COD	Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in in µS/cm.
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.
KAR	Potassium adsorption ratio. A measure of the suitability of water use in agricultural irrigation, as determined by the concentrations of solids dissolved in the water.
L/s	Litres per second.
mS/m	Millisiemens per metre.
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).
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.
SAR	Sodium adsorption ratio. A measure of the suitability of water use in agricultural irrigation, as determined by the concentrations of solids dissolved in the water.
SS	Suspended solids.

STDC	South Taranaki District Council.
Temp	Temperature, measured in °C (degrees Celsius).
UI	Unauthorised Incident.
µS/cm	Microsiemens per centimetre.

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

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Appendix I

Resource consents held by Silver Fern Farms Ltd (Waitotara)

(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:	Silver Fern Farms Limited PO Box 941 Dunedin 9054
Decision Date:	13 September 2017
Commencement Date:	13 September 2017

Conditions of Consent

Consent Granted:	To discharge to land wastewater by spray irrigation, stockyard solid wastes and stabilised sludge by spreading, from meat processing operations in the vicinity of the Waitotara River, including associated discharges to air
Expiry Date:	1 June 2034
Review Date(s):	June 2022 and at 3-yearly intervals thereafter
Site Location:	Waiinu Beach Road, Waitotara
Grid Reference (NZTM)	1747946E-5588813N (Pond 1) 1747993E-5588722N (Pond 2) 1748071E-5588544N (Area 1) 1749151E-5586993N (Area 2)
Catchment:	Waitotara

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

General condition

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

Special conditions

1. The discharge of stockyards solid waste shall occur by spreading at a rate not exceeding 28 cubic metres over any 7-day period, and the discharge of wastewater shall occur by spray irrigation at a rate not exceeding 1700 cubic metres/day.

2. The discharges authorised by this consent shall only occur on the 'disposal areas' shown in Figure 1 attached.

3. The discharge shall not result in odour that is offensive or objectionable beyond the boundary of the disposal areas shown in Figure 1 attached.

4. The discharge shall not result in spray drift beyond the boundary of the disposal areas.

5. The consent holder shall manage the site in accordance with an 'Integrated Management Plan' (IMP) prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The IMP shall detail the management of the spray irrigation and solid waste management system at the site to achieve compliance with the conditions of this consent. An objective of the IMP shall be to keep the annual nitrogen loading from wastewater, stockyards solids and solid organic waste material discharged on the 'disposal areas' to 300 kg/ha or less. The IMP shall address the following matters, as a minimum:

    a) designated disposal areas;
    b) selection of appropriate irrigation and spreading 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 ponding, runoff and spray drift;
    h) minimisation and control of odour effects offsite;
    i) operational control and maintenance of the spray irrigation system;
    j) monitoring of the wastewater (physicochemical);
    k) monitoring of soils and herbage (physicochemical);
    l) monitoring of groundwater beneath the irrigated area (physicochemical);
    m) remediation measures;
    n) contingency events;
    o) reporting monitoring data;
    p) procedures for responding to complaints; and
    q) notification to the Council of non-compliance with the conditions of this consent.

6. The *IMP* described in special condition 5 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 *IMP* annually and shall provide the reviewed plan to the Chief Executive, Taranaki Regional Council, by 31 December.

7. 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 *IMP* and shall be advised immediately of any revision or additions to the *IMP*.

8. The consent holder shall undertake a monitoring programme that identifies and monitors the risk to the Waiinu Water Supply provided by the bore located at approximate grid reference 1748791E-5586518 (NZTM) resulting from the exercise of this consent. The programme of monitoring shall be submitted to the Chief Executive, Taranaki Regional Council for certification before 31 December 2017 and shall include as a minimum, the drilling and monitoring of bores down gradient of the MP5 (GND0686) monitoring bore at locations and depths determined after consultation with the Chief Executive, Taranaki Regional Council.

9. 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 of the discharge on the environment.

10. The sodium adsorption ratio (SAR) of the wastewater shall not exceed 15.

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

12. No contaminants shall be discharged within:

    (a) 25 metres of any surface water body; or
    (b) 25 metres of any fenced urupa (burial ground) without the written approval of the relevant Iwi; or
    (c) subject to condition 13 below, 20 metres from any public road;
    (d) 50 metres of any bore, well or spring used for water supply purposes; or
    (e) 150 metres of any dwelling that is not owned by the consent holder, or any marae, unless the written approval of the owner and occupier has been obtained to allow the discharge at a closer distance.

13. Where any new public road is established that shares a boundary with a disposal area, there shall be no discharge to land within 20 metres of the road surface until the shelter vegetation on that boundary is at least two metres high. Once the shelter vegetation exceeds two metres in height, the discharge may occur no less 10 metres from the road surface.

14. The consent holder shall keep records of the rate and volume of wastewater and stockyards solid waste discharged to an accuracy of ±5%, including, but not limited to the:

    (a) effluent type (e.g. liquid, slurry, solid);
    (b) source of any solid waste;
    (c) location and area (ha) of application of wastewater and/or solid waste; and
    (d) date each site location received the wastewater and/or solid waste application.

15. If, as a consequence of the activity authorised by this consent, an event occurs that may have a significant adverse effect on water quality at the registered drinking-water supply abstraction point for Waiinu Beach [Map Ref: 1748791E-5586518 (NZTM)] the consent holder shall, as soon as reasonably practicable, telephone the Taranaki Regional Council and South Taranaki District Council and notify them of the event.

16. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2022 and at 3-yearly intervals thereafter, for the purposes of:

    (a) ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or

    (b) setting limits for any contaminant if the concentration of that contaminant in groundwater at a disposal area is increasing at a rate that could make it unsuitable for any existing potential use; and/or

    (c) requiring any data collected in accordance with the conditions of this consent to be transmitted directly to the Taranaki Regional Council's computer system, in a format suitable for providing a 'real time' record over the internet.

Transferred at Stratford on 26 November 2018

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

Advice Note (included at the request of DITAG)
The consent holder's attention is drawn to MPI's "New Zealand Code of Practice for the Design and Operation of Farm Dairies (NZCP1) which restricts:

- *The discharge of specified wastes to land used for grazing of milking animals; and*
- *The use of feed from land which has had specified wastes applied to it.*

Should you require further information, please contact a Dairy Industry Technical Advisory Group (DITAG) representative ***or*** *visit http://www.foodsafety.govt.nz/elibrary/industry/dairy-nzcp1-design-code-of-practice/amdt-2.pdf (specifically section 4.4 Disposal of effluent and other wastes and section 5.8 Purchased Stock Food) or contact an operation dairy processing company regarding conditions of supply.*

Figure 1: Approximate locations of 'Disposal Areas for the stockyards solid waste and wastwater spray irrigation

Water Permit

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

Name of Consent Holder:	Silver Fern Farms Limited PO Box 941 Dunedin 9054
Decision Date:	23 August 2016
Commencement Date:	23 August 2016

Conditions of Consent

Consent Granted:	To take groundwater from three bores in the vicinity of the Waitotara River for meat processing purposes
Expiry Date:	1 June 2040
Review Date(s):	June 2022 and every six years thereafter and in accordance with special condition 13
Site Location:	Waiinu Beach Road, Waitotara
Grid Reference (NZTM)	1747961E-5588986N 1748173E-5588850N 1748280E-5588815N
Catchment:	Waitotara

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

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www.facebook.com/TaranakiRegionalCouncil twitter.com/TaranakiRC
Please quote our document number in your reply

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 total rate of taking shall not exceed 20 litres per second and the total volume taken in any 24 hour period ending at midnight (New Zealand Standard Time) shall not exceed 1,300 cubic metres.

2. All bores shall be easily identifiable by permanent labels, which may be welded or engraved on the casing, or on the equivalent fixed part of the well construction or associated building. The numbering on the label shall be the bore number assigned by the Taranaki Regional Council.

3. 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 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 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 have a limited lifespan.

4. The records of water taken shall:

   a) be in a format that, in the opinion of the Chief Executive, Taranaki Regional Council, is suitable for auditing;
   b) specifically record the water taken as 'zero' when no water is taken; and
   c) for each 12-month period ending on 30 June, be provided to the Chief Executive, Taranaki Regional Council within one month after end of that period.

5. The consent holder shall provide the Chief Executive, Taranaki Regional Council with a document from a suitably qualified person certifying that water measuring 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;
   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.

6. 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.

7. Before 31 August 2017 the consent holder shall ensure that a continuous record of groundwater level data is maintained by installing an automatic groundwater level recording device in to a dedicated monitoring bore. The device shall measure and record the water level at intervals not exceeding 15 minutes to an accuracy of ± 10 mm and be tamper-proof.

8. Before 30 August 2017 the consent holder shall, unless it is not practically achievable in a particular case, ensure that a continuous record of groundwater level data is maintained by installing an automatic groundwater level recording device into any operational groundwater abstracting bore. The device shall measure and record the water level at intervals not exceeding 15 minutes to an accuracy of ± 10 mm and be tamper-proof.

9. The water meters and data loggers shall be accessible to Taranaki Regional Council officers at all reasonable times for inspection and/or data retrieval.

10. At all times the consent holder shall take all practicable steps to take and use water efficiently and generally prevent or minimise any adverse effects on the environment including as minimum, by ensuring that the minimum amount of water necessary for the purpose is taken.

11. The consent holder shall ensure that the bores and associated pipework are designed and configured in such a way that no water from any source can re-enter any bore.

12. Before 30 September 2020 and every three years thereafter an assessment of the sustainability of the aquifer shall be undertaken and be provided in the form of a report to the Chief Executive, Taranaki Regional Council. The report shall include as a minimum:

    i) A borefield description;
    ii) A description of the on site water use, water sources and discharges;
    iii) All groundwater level data, abstraction data and groundwater quality data collected to 30 June of that year (*Monitoring data is to be presented in tables and graphical format, raw data in appendix, summary data in text);*
    iv) A discussion on groundwater levels, observed trends and the aquifers response to abstraction;
    v) A discussion on groundwater quality and the results of any groundwater quality analysis;
    vi) An assessment of the impacts; including the capacity of the aquifer to sustain the demands on it.

    Note: This assessment may be undertaken by the Taranaki Regional Council or a suitably qualified and experienced groundwater professional on behalf of the consent holder.

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:

    a. during the month of June 2022 and every six years thereafter; and/or
    b. within 3 months of the submittal of a report required under special condition 12 above;

    for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 26 November 2018

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Silver Fern Farms Limited PO Box 941 Dunedin 9054
Decision Date:	13 September 2017
Commencement Date:	13 September 2017

Conditions of Consent

Consent Granted:	To discharge emissions into the air from various activities associated with meat processing operations
Expiry Date:	1 June 2034
Review Date(s):	June 2022, June 2028
Site Location:	Waiinu Beach Road, Waitotara
Grid Reference (NZTM)	1748090E-5588905N (approximate centre of site)

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

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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. This consent authorises emissions to air from activities on the site (as shown in Appendix One) generally of the nature and scale described in the application for this consent.

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

3. The discharges authorised by this consent shall not give rise to any odour at or beyond the site boundary (as shown in Appendix One) of the site that is offensive or objectionable.

4. Any discharge from the factory site shall be free of smoke.

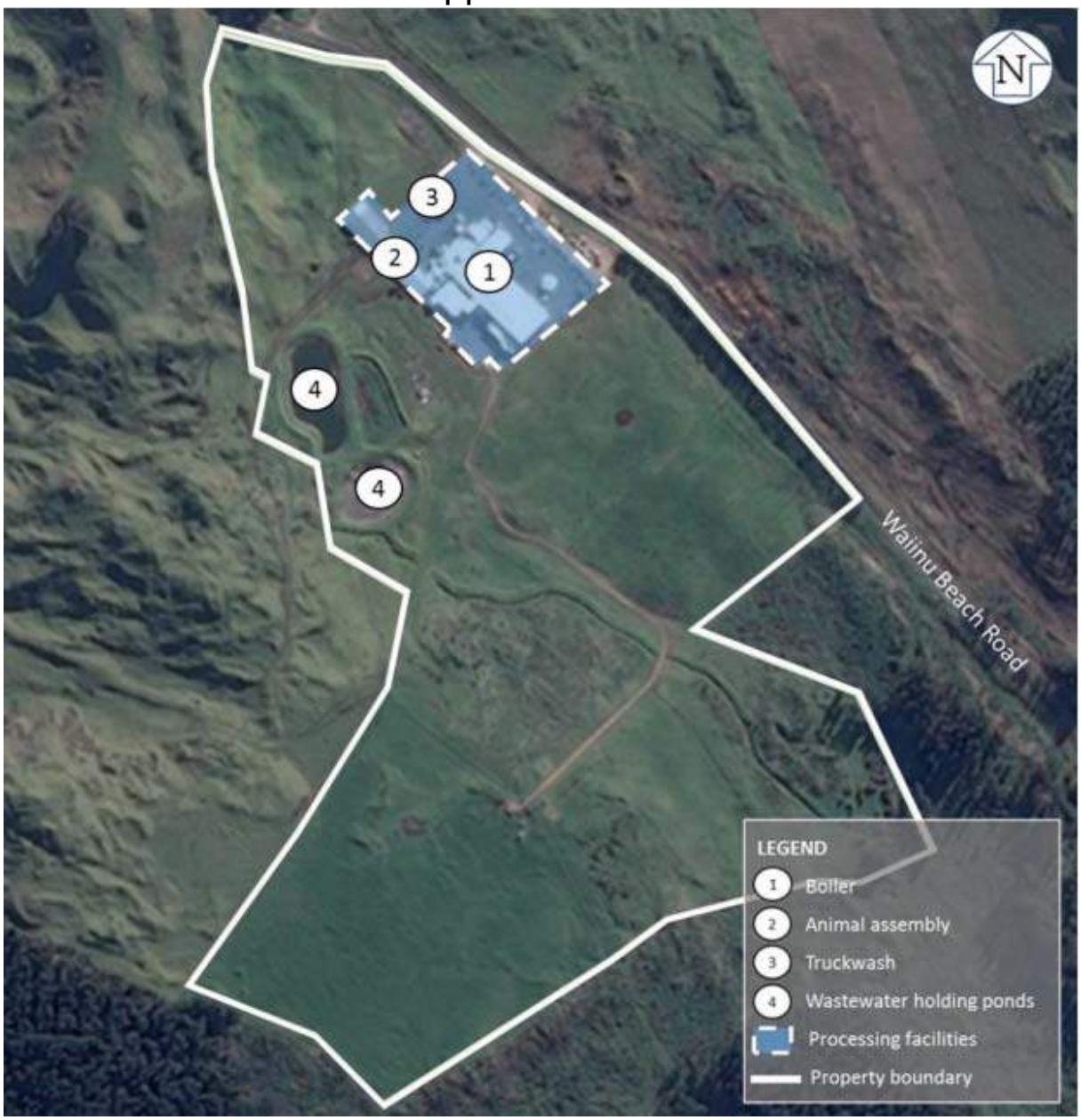
5. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2022 and/or June 2028, for the purpose of ensuring that that conditions are adequate to deal with any adverse effects of the abstraction on the environment arising from the exercise of this consent, which were not foreseen at the time the application was considered and which it was not appropriate to deal with at that time.

Transferred at Stratford on 26 November 2018

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

Appendix One



Area of discharge bounded by the white line

Discharge Permit

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

Name of Consent Holder:	Silver Fern Farms Limited PO Box 941 Dunedin 9054
Decision Date:	8 November 2010
Commencement Date:	8 November 2010

Conditions of Consent

Consent Granted:	To discharge stormwater, defrost water and evaporative cooling water from a meat processing plant site into an unnamed tributary of the Waitotara River
Expiry Date:	1 June 2028
Review Date(s):	June 2022
Site Location:	Waiinu Beach Road, Waitotara
Grid Reference (NZTM)	1748084E-5589290N
Catchment:	Waitotara

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

General condition

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

Special conditions

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

2. The stormwater discharge shall be from a catchment area on the site not exceeding 2.3 hectares.

3. Any significant volumes of hazardous substances (e.g. diesel fuel, hydrochloric acid and sulphuric acid) on site shall be:

   a) contained in a double skinned tank, or
   b) stored in a dedicated bunded area with drainage to sumps, or to other appropriate recovery systems, and not directly to the site stormwater system.

4. Constituents of the discharge shall meet the standards shown in the following table.

Constituent	Standard
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm^{-3}
oil and grease	Concentration not greater than 15 gm^{-3}

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

5. After allowing for reasonable mixing, within a mixing zone extending 30 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

   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 fresh water unsuitable for consumption by farm animals;
   e) any significant adverse effects on aquatic life.

6. The consent holder shall maintain a contingency plan. The contingency plan shall be adhered to in the event of a spill or emergency and shall, to the satisfaction of the Chief Executive, Taranaki Regional Council, detail measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not authorised by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.

7. The consent holder shall maintain a stormwater management plan. This plan shall be adhered to at all times and shall, to the satisfaction of the Chief Executive, Taranaki Regional Council document how the site is to be managed in order to minimise the contaminants that become entrained in the stormwater. The plan shall include but not necessarily be limited to:

   a) the loading and unloading of materials;
   b) maintenance of conveyance systems;
   c) general housekeeping; and
   d) management of the interceptor system.

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

8. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site, that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to worknotification@trc.govt.nz.

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:

   a) during the month of June 2016 and/or June 2022; and/or
   b) within 3 months of receiving a notification under special condition 8 above;

   for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 26 November 2018

For and on behalf of
Taranaki Regional Council

_____

A D McLay
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:	Silver Fern Farms Limited PO Box 941 Dunedin 9054
Decision Date:	14 December 2016
Commencement Date:	14 December 2016

Conditions of Consent

Consent Granted:	To take and use water from a spring for non-potable plant purposes
Expiry Date:	1 June 2040
Review Date(s):	June 2022 and at 3-yearly intervals thereafter
Site Location:	Waiinu Beach Road, Waitotara
Grid Reference (NZTM)	1747918E-5589220N
Catchment:	Waitotara

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

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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 rate of taking shall not exceed 4.4 litres per second, and the volume taken in any 24 hour period ending at midnight (New Zealand Standard Time) shall not exceed 350 cubic metres.

2. 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 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.

3. 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.

4. 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 and a maintenance report provided to the Chief Executive, Taranaki Regional Council within 30 days of the work occurring.

5. Any water meter or datalogger shall be accessible to Taranaki Regional Council officers at all reasonable times for inspection and/or data retrieval. In addition the data logger shall be designed and installed so that Taranaki Regional Council officers can readily verify that it is accurately recording the required information.

6. The records of water taken:

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

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

   (c) be transmitted directly to the Taranaki Regional Council's computer system, in a format suitable for providing a 'real time' record over the internet.

7. This consent shall lapse on 31 December 2021, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2022 and at 3 yearly intervals thereafter for the purposes of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 26 November 2018

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management