Silver Fern Farms Ltd Waitotara Monitoring Programme Biennial Report 2012-2014

Technical Report 2014-87

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Executive summary

Silver Fern Farms Limited (Waitotara) operates a meat processing plant located on Wai-inu Beach Road, Waitotara in the Waitotara catchment. This report for the two-year period 1 October 2012 to 30 September 2014, which coincides with killing seasons, describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Company's environmental performance during the period under review, and the results and environmental effects of the Company's activities.

The Company holds a total of four resource consents, which include a total of 18 conditions setting out the requirements that the Company must satisfy. The Company holds resource consents to allow it to take and use 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.

During the monitoring period, Silver Fern Farms Limited (Waitotara) demonstrated an overall high level of environmental performance.

The Council's monitoring programme for each year under review included four inspections, and the collection of four effluent and 20 groundwater samples for physicochemical analysis. The Company supplied annual environmental monitoring reports, as well as records of the volume of water abstracted and the volume of effluent discharged.

Abstraction volumes from groundwater bores and a spring complied with the consent limits. Telemetry to Council was installed in September 2014 for delivery of abstraction data.

In September 2012, the Company commissioned a 20.7 ha extension of the irrigation area, and a further extension of 6.0 ha became operational in January 2013. Both areas were already covered by resource consent. This voluntary action, for which the Company was given an Environmental Award by Council, increased the area irrigated for wastewater disposal by 36% to 110.5 ha to provide for increased production at the meat processing plant and to lower nitrogen loadings. Irrigation of the undeveloped areas will also increase pasture production. Monitoring of a site of significance to Ngaa Rauru Kiitahi, a spring at the coast, was initiated in relation to the extension.

Stormwater and cooling water discharges were not found to have significant environmental effect, though one breach of consent conditions was recorded in 2014.

No adverse effect of emissions to air was recorded.

During the period under review, the Company demonstrated a high level of environmental performance and administrative compliance with the resource consents.

For reference, in the 2012-2013 year, 35% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 59% demonstrated a good level of environmental performance and compliance with their consents. In the 2013-2014 year, 60% of consent holders achieved a high level of environmental performance and compliance with their consents, while another 29% demonstrated a good level of environmental performance and compliance.

This report includes recommendations for the 2014-2015 year.

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1. Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is the Biennnial Report for the period October 2012-September 2014 by the Taranaki Regional Council on the monitoring programme associated with resource consents held by Silver Fern Farms Limited (Waitotara) (SFF Waitotara). The Company operates a meat processing plant situated on Wai-inu Beach Road at Waitotara, in the Waitotara catchment. The monitoring period coincides with the killing season.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by SFF 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 SFF Waitotara 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 Taranaki Regional Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of the SFF Waitotara's use of water, land, and air, and represents the twenty-second and twenty-third combined annual reports by the Taranaki Regional 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 compliance monitoring under the RMA and the Council's obligations and general approach to monitoring sites through annual programmes, the resource consents held by SFF Waitotara, the nature of the monitoring programme in place for the period under review, and a description of the activities and operations conducted at the Company's site.

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

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

Section 4 presents recommendations to be implemented in the 2014-2015 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 *Resource Management Act 1991* (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 a discharger, and may include cultural and socio-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 (eg, recreational, cultural, or aesthetic);
(e) risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Taranaki Regional 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 performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continuously assess its own performance in resource management as well as that of resource users, particularly consent holders. It further enables the Council to continually re-evaluate its approach and that of consent holders to resource management, and, ultimately, through the refinement of methods, and considered responsible resource utilisation to move closer to achieving sustainable development of the region's resources.

1.1.4 Evaluation of environmental performance

Besides discussing the various details of the performance and extent of compliance by SFF Waitotara during the period under review, this report also assigns an overall rating. The categories used by the Council, and their interpretation, are as follows:

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

Events that were beyond the control of the consent holder and unforeseeable (i.e. a defence under 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 significant 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 in response to unauthorised incident reports, 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 in response to unauthorised incident reports. 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 in response to unauthorised incident reports. 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.

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 3, and the layout of the irrigation system in Figure 2. The nearest dwellings are farmhouses, situated about 900 metres to the north and 1200 metres to the south-east. The Waitotara River is located approximately 450 metres 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 plant employs up to 335 people at any given time, and has an optimum annual capacity of one million sheep and bobby calves over a 50-week processing period. 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.

Annual kills since the 1995-96 season are shown in Figure 1. A total of 641,211 animals were processed over the 2012-2013 monitoring period, and 558,298 in 2013-2014, compared with 578,786 in 2011-2012. The kill in 2012-2013 was the highest in 10 years, largely as the result of a severe drought. Slaughter reduced in 2013-2014 while stock numbers recovered.

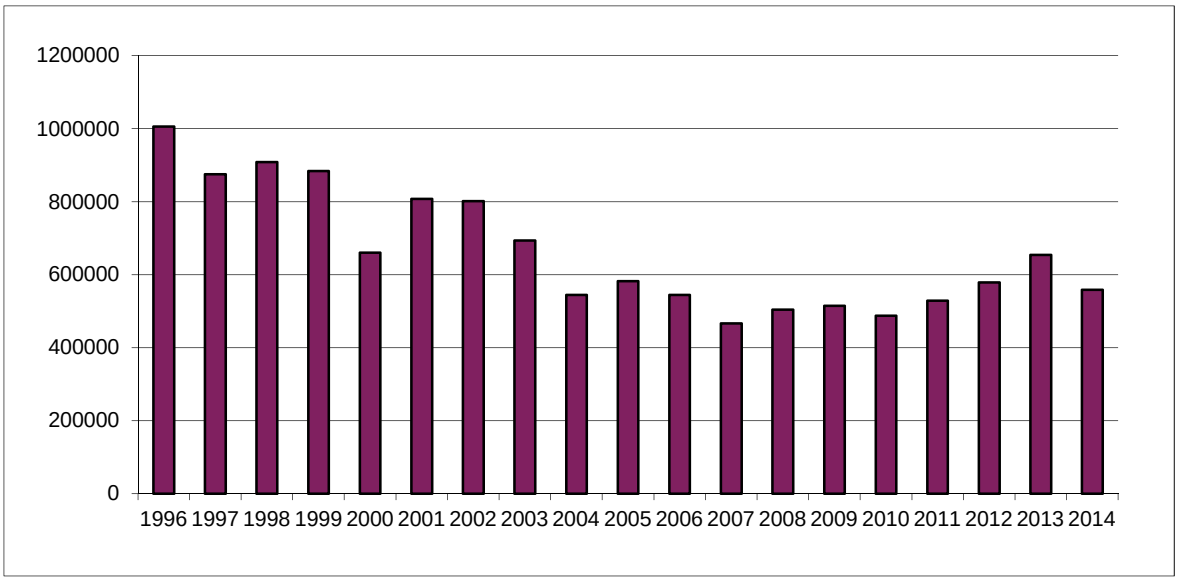


Figure 1 Annual kills since 1995-1996 season

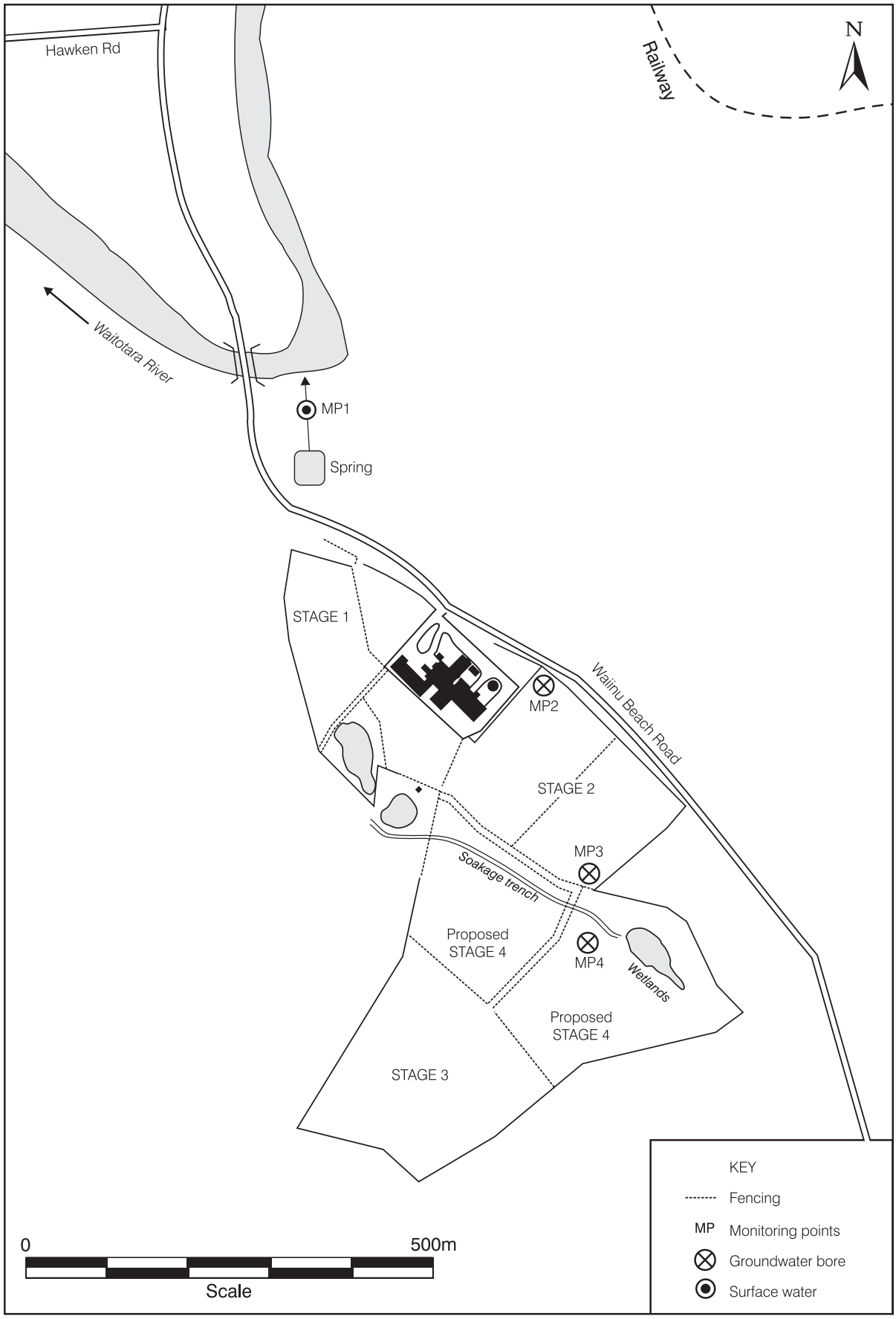


Figure 1 Location of SFF Waitotara meat processing plant showing irrigation areas and groundwater monitoring points

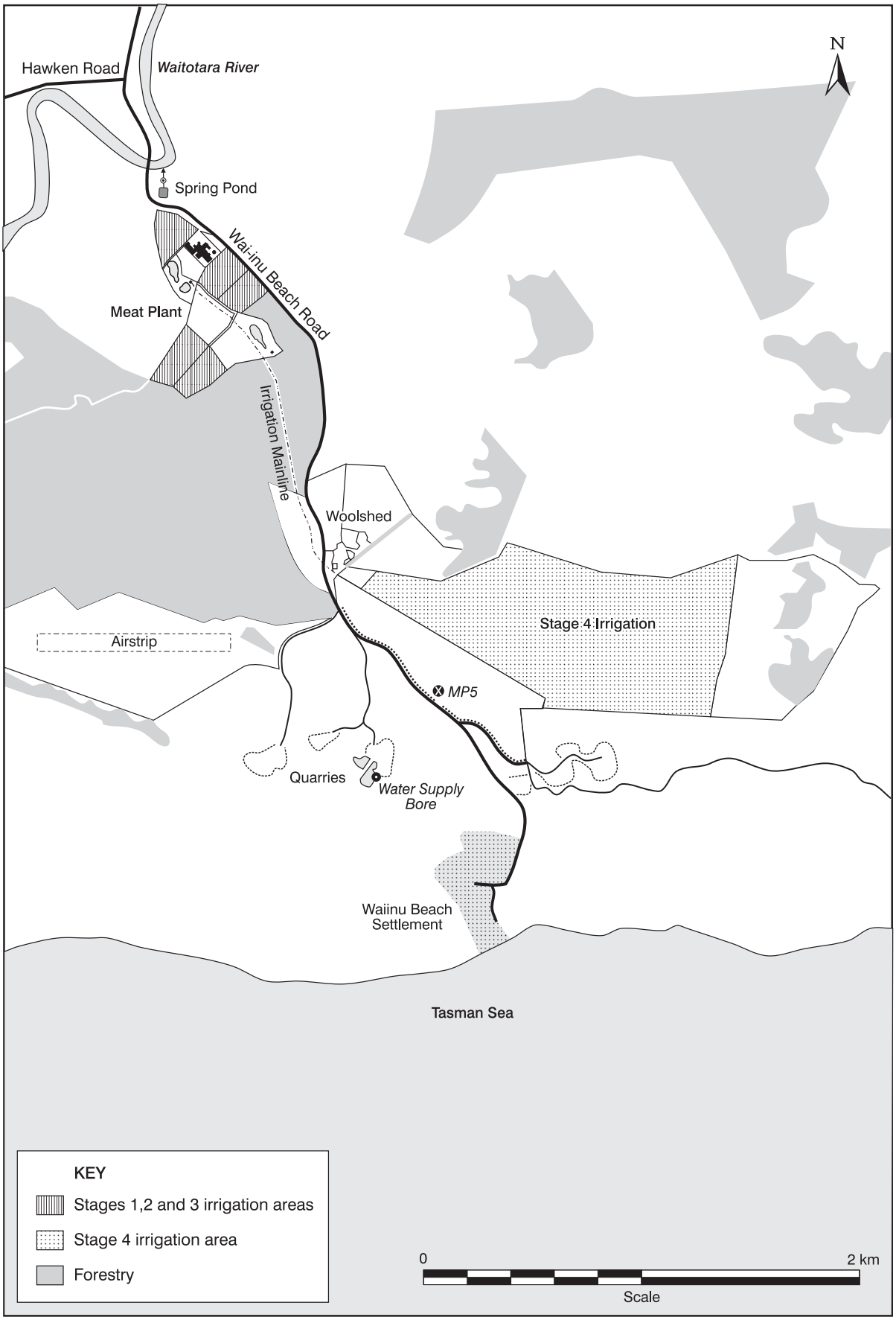


Figure 2 Location of SFF Waitotara meat processing plant showing irrigation areas and groundwater monitoring points

Ownership of the plant has changed twice. The original owner, Waitotara Meat Company, merged with Richmond Limited in October 1999, which in turn amalgamated with PPCS Limited in December 2004. PPCS Limited was rebranded Silver Fern Farms Limited 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 cubic metres per day, produce from an aquifer located at a depth of 122 to 140 metres. 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 the Company, and checked by the Regional Council, shows that the maximum sustainable yield is 3000 cubic metres/day. Thus the aquifer capacity is substantially greater than the peak abstraction rate and is sufficient to supply the plant's needs without detriment to other users of the aquifer.

A secondary supply, for stock and yard washing purposes is drawn at a rate of up to 200 cubic metres per day from springs which arise beside the Waitotara River, about 400 metres from 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 effluent consists of wash-water from the washing of carcasses, pelts and offal, and from cleansing of process areas. Effluent 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.

In September 2012, a total area of 80.7 ha (revised from 77.3 ha since 2010-2011) was irrigated, in two locations (Figure 2). An area of 13.3 ha adjacent to the plant that was owned by the Company was irrigated by 15 independently controlled fixed sprinkler networks. An area of 70.4 ha (revised from 64 ha) on the farm of Longview Limited, 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 effluent 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 Longview Farm reticulation was extended by 20.7 ha to 91.2 ha in September 2012, and the fixed sprinkler irritation area next to the plant was extended by 6.0 ha to 19.3 ha in January 2013, making a total irrigated area of 110.5 ha.

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 effluent is primarily managed by SFF Waitotara via the Effluent 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 Discharge to air

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

1.3 Resource consents

1.3.1 Water abstraction permit

Section 14 of the Resource Management Act 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.

SFF Waitotara holds water abstraction permit **2261** to take up to 1300 cubic metres/day [17.6 litres/second] of water from three groundwater bores in the vicinity of the Waitotara River for meat processing purposes. This permit was issued by the Taranaki Regional Council on 23 January 1998 as a resource consent under Section 87(e) of the Resource Management Act. It is due to expire on 1 June 2016.

The consent has three special conditions. These special conditions cover the method and recording requirements for the water take.

Condition 1 sets out the need to operate a measuring device to record daily abstraction rates from each of the bores, as well as to keep records which shall be provided to the Council upon request.

Condition 2 requires that the bore head works shall be maintained to allow for water level measurements and water quality sampling.

Condition 3 is a review provision.

The permit is attached to this report in Appendix I.

1.3.2 Water discharge permit

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.

SFF Waitotara holds water discharge permit **5027** which allows for the discharge of stormwater, defrost water and evaporative cooling water into an unnamed tributary of the Waitotara River. This permit was issued by the Taranaki Regional Council on 8 November 2010 as a resource consent under section 87(e) of the RMA. The permit provides the option for review in June 2016 and in June 2022. The permit is due to expire in June 2028.

Consent **5027-2** has nine special conditions that relate to managing the quality of the stormwater discharge from the site.

Condition 1 requires the best practicable option for prevention of adverse effects on the environment to be used at all times.

Condition 2 limits the catchment area of the site.

Condition 3 relates to the containment of hazardous substances.

Condition 4 sets the concentration limits of pH, oil and grease, and suspended solids that should not be exceeded in the discharge.

Condition 5 deals with the discharge and its effects on the receiving waters.

Condition 6 requires the provision of a contingency plan which outlines procedures in the event of spillage or discharge of contaminants.

Condition 7 requires the preparation and maintenance of a stormwater management plan which outlines how the site is to be managed in order to minimise the contaminants that become entrained in stormwater.

Condition 8 relates to notification requirements.

Condition 9 provides for a review of the consent.

The permit is attached to this report in Appendix I.

1.3.3 Air discharge permit

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.

SFF Waitotara holds air discharge permit **4629** to cover the discharge of emissions into the air from various activities associated with meat processing operations. This permit was issued by the Taranaki Regional Council on 23 January 1998 under Section 87(e) of the RMA. It is due to expire on 1 June 2016.

Consent **4629** has five special conditions that relate to the management of discharges to air from the site.

Condition 1 requires the adoption of the best practicable option.

Condition 2 requires that odour generated from the site not be objectionable beyond the boundary of the site.

Condition 3 requires the Company to detail emission inventories from the site upon request.

Condition 4 requires that the discharge from the site be free of smoke.

Condition 5 provides for review of the consent.

The permit is attached to this report in Appendix I.

1.3.4 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.

SFF Waitotara holds water discharge permit **2260** which allows for the discharge of up to 1700 cubic metres/day of waste by spreading onto land and of wastewater by spray irrigation onto land from meat processing operations in the vicinity of the Waitotara River. This permit was issued by the Taranaki Regional Council on 2 July 1998 as a resource consent under Section 87(e) of the RMA. It is due to expire on 1 June 2016.

The consent has six special conditions. These special conditions relate to the quality of the discharge, and the effects on groundwater and the surrounding environment.

Condition 1 requires a management plan to be provided to the Council which addresses the method and rate of effluent application as well as measures that will be undertaken to minimise effects.

Conditions 2 and 3 require that the discharge does not result in offensive odour, or spray drift beyond the boundary of the property.

Condition 4 sets out the need to minimise impacts on groundwater.

Conditions 5 and 6 relate to the review of the management plan and review of the consent conditions.

The permit is attached to this report in Appendix I.

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the RMA sets out an obligation for the Taranaki Regional Council to gather information, monitor, and conduct research on the exercise of resource consents, and the effects arising, within the Taranaki region.

The Taranaki Regional 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 SFF Waitotara's meat processing plant is carried out by both the Company 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 effluent management plan has been prepared which specifically addresses monitoring of discharges to land.

1.4.2 Monitoring by SFF Waitotara

Monitoring undertaken by the Company covers two main areas as described below.

Water abstraction

The Company monitors the volume of water abstracted and reports the results to the Regional Council annually. Telemetry of abstraction rate and of bore water level was commissioned on 24 September 2014.

Irrigation system management

The irrigation system is managed through monitoring and control of volumes of wastewater applied to 23 sectors 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, the Company 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 Taranaki Regional Council

The consent monitoring programme for the SFF Waitotara site undertaken by the Council consists of four primary components as described below.

Programme liaison and management

There is generally a significant investment if 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 reviews;
- renewals;
- new consents;
- advice on the Council's environmental management strategies and content of regional plans and;
- consultation on associated matters.

Review of SFF Waitotara monitoring data

Monitoring data gathered by the Company are reviewed to determine compliance with resource consent conditions and to assess trends in water usage, and in effluent 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 effluent 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 effluent quality are discussed. The site neighbourhood is surveyed for environmental effects.

Chemical sampling

The composition of effluent irrigated and groundwater around irrigation areas is monitored quarterly. The effluent is analysed to determine its organic and mineral strength, particularly for calculation of nitrogen loading on irrigation areas. Groundwater at five locations, comprising four monitoring bores and a spring, is analysed to determine the effects of irrigation on water quality, particularly on nitrate concentration.

2. Results

2.1 Water

2.1.1 Inspections

An officer of the Taranaki Regional Council carried out four routine inspections of the SFF Waitotara site each year during the 2012-2014 monitoring period. These took place on 17 December 2012, 18 March, 14 June, 16 September and 16 December 2013, and 17 March, 23 June and 8 September 2014. Each inspection by an officer of the Council is usually conducted in conjunction with a Company 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.

2.1.2 Results of water abstraction monitoring

Records of abstraction volume for the review period have been supplied by the Company, in accordance with special condition 1 on consent **2261**. Volumes for each bore and the spring are monitored separately. Average daily abstraction volumes for the monitoring period, on a weekly basis, are shown in Figure 4.

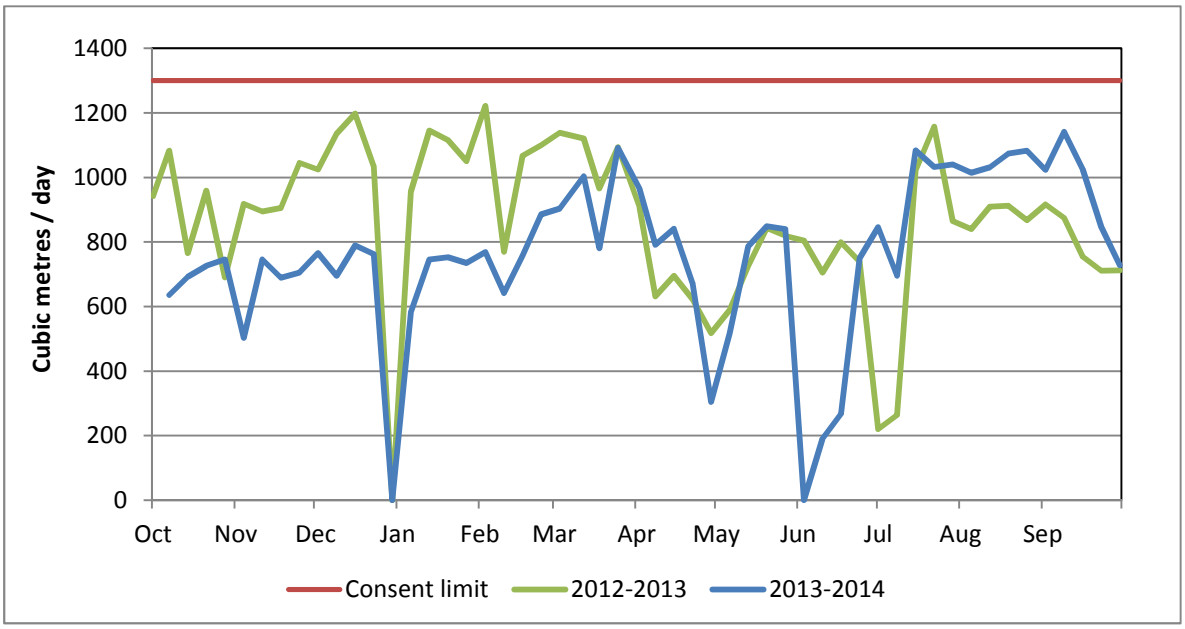


Figure 3 Average daily abstraction rate October 2012 - September 2014

The total volume abstracted over the 12-month period ending 30 September 2013 was approximately 313,753 m^3, of which 281,340 m^3 was taken from the deep aquifers and 32,413 m^3 from the spring beside the Waitotara River. This equates to 0.489 m^3 per animal slaughtered, which is equivalent to a decrease of 0.033 m^3, or 6.3%, per animal compared to the 2011-2012 monitoring period.

The total volume abstracted over the 12-month period ending 30 September 2014 was approximately 276,755 m^3, of which 247,010 m^3 was taken from the deep aquifers and 29,745 m^3 from the spring beside the Waitotara River. This equates to 0.496 m^3 per animal slaughtered, which is equivalent to an increase of 0.007 m^3, or 1.4%, per animal compared to the 2012-2013 monitoring period.

The average abstraction rate was within the limit of 1300 cubic metres/day.

2.1.3 Results of discharge monitoring

2.1.3.1 Effluent monitoring

Irrigation volumes

Records of the volume of effluent irrigated at the SFF Waitotara site have been supplied by the Company in accordance with the Effluent Management Plan. The reported total volume irrigated for the 12-month period ending 30 September 2013 was approximately 267,849 m^3. This value represents 85% of the reported water abstraction volume. The reported total volume irrigated for the 12-month period ending 30 September 2014 was approximately 224,342 m^3. This value represents 81% of the reported water abstraction volume. Some of the reasons put forward by the Company for the difference in the volumes abstracted and discharged are;

- Not all waste streams are directed to effluent for disposal, for example cooling water and domestic sewage;
- Loss of boiler-generated steam to atmosphere;
- Evaporation from the cooling towers;
- Evaporation from effluent ponds;
- Release of off-specification stored chlorinated water (infrequent)

Effluent composition

The results from chemical monitoring of effluent irrigated are given in Table 1. Samples were taken from a tap that was installed on the irrigation line in the pump shed beside Pond 2 on 17 December 2012 (site code IND003001, NZTM Grid Reference 1748026-5588757). Previously, samples were taken just beneath the surface of Pond 2 adjacent to the inlet to the irrigation pump. The new sampling point enables better representation of the wastewater irrigated. The results of monitoring of Pond 2 are used below, as this is the regular effluent holding pond, with Pond 1 only used in the event of an emergency (ie, a problem with the irrigators or plant which results in the need to hold effluent for a period of time).

Table 1 Chemical monitoring results for irrigation pond 2012-2014

Sample		Summary of Past Results 1991-2012				17 Dec 2012	18 Mar 2013	14 Jun 2013	16 Sep 2013	16 Dec 2013	17 Mar 2014	23 Jun 2014	8 Sep 2014
		N	Max	Min	Med								
Time	NZST					1130	0855	0925	0920	0900	0910	1015	1135
Temperature	°C	70	30.8	11.6	21.0	30.3	26.6	21.9	20.0	26.8	24.6	17.0	25.0
Conductivity, 20°C	mS/m	76	246	81.1	144	126	126	134	133	148	151	119	128
pH	pH	75	7.7	6.8	7.1	7.2	7.1	7.1	7.0	7.2	7.1	7.1	6.8
Suspended solids	g/m³	73	2500	28	170	720	900	450	370	330	630	300	94
COD	g/m³	75	4700	100	450	850	880	850	410	580	920	540	300
Total nitrogen	g/m³N	47	174	47	108	93	98	98	126	118	118	93	120
Ammonia nitrogen	g/m³N	76	190	12.9	95	74	60	82	100	102	94	62	112
Total phosphorus	g/m³P	63	38	6.8	18	17	14	15	12	18	20	20	10
Sodium	g/m³	75	241	75	108	104	100	106	91	107	120	99	93
Potassium	g/m³	74	347	22	104	90	96	116	53	108	114	102	36
Calcium	g/m³	73	76	11	28	22	29	22	16	30	30	24	18
Magnesium	g/m³	73	11	2.5	5.9	6.0	6.7	6.0	4.3	6.7	7.0	5.4	3.8
SAR						5.1	4.3	5.2	5.2	4.6	5.1	4.7	5.2
KAR						2.6	2.4	3.4	1.8	2.7	2.9	2.9	1.2

SAR = Sodium adsorption ration; KAR = Potassium adsorption ratio.

A summary of past results is included for comparison. The relocation of the sampling point, from the effluent pond surface to the irrigation line, is likely to have reduced variation in test result values.

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 killing seasons. 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 effluent total nitrogen concentrations, as provided by the Company, the average nitrogen loading over the entire 110.8 ha (enlarged) area irrigated for the 2012-2013 review period was 297 kg/ha/y. (A total of 32,909 kg of nitrogen was applied to the entire area, including the extension, at an average concentration of 125 g/m³). The highest loading for a single sector was 672 kg/ha/y, on Longview Farm.

For the 2013-2014 review period, a total of 24,714 kg of nitrogen was applied to the entire area, at an average concentration of 110 g/m³. The average nitrogen loading was 223 kg/ha/y, being 251 kg/ha/y on Longview Farm and 93 kg/ha/y adjacent to the plant. The highest loading for a single sector was 396 kg/ha/y, on Longview Farm.

2.1.3.2 Groundwater monitoring

The locations of the five groundwater monitoring points (MPs) are depicted in Figures 2 and 3 and described in Table 2. 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 effluent holding ponds (pre 1999). The fifth point is downslope of the Longview Farm irrigation area.

MP1 is the spring from which water is drawn for stock and yard washing. The spring is located approximately 120 metres from the Stage I irrigation area at the nearest point. The other four monitoring points are piezometer bores which are located at the periphery of irrigation areas. MP2 is underneath (section 5 of) Stage II irrigation area. MP3 is about 35 metres downslope of the old effluent overflow trench and of the new Stage IV area. MP4 is in the lower part of the Stage IV area, about 200 metres downslope of the Stage III area and about 35 metres upslope of the effluent overflow trench. The effluent overflow trench runs between MP3 and MP4 to the wetland.

MP5 is downslope of Longview Farm irrigation area, beside Wai-inu Beach Road. It lies between Longview irrigation area and the old quarry where the water supply bore for Wai-inu Beach is situated.

Table 2 Groundwater monitoring sites

Name	Site Code	Location	Grid reference, NZTM	
MP1	GND1124	Spring N (downslope) of Stage 1 irrigaiton area, adjacent to Waitotara River	1747905	5589252
MP2	GND000097	Piezometer, N (downslope) corner of Stage 2 irrigation area	1748176	5588876
MP3	GND000098	Piezometer, S (upslope) corner of Stage 2 irrigation area	1748231	5588618
MP4	GND000099	Piezometer, NE (downslope) of Stage 3 irrigation area, adjacent to wetland	1748351	5588498
MP5	GND0686	Piezometer, W (downslope) of Stage 4 irrigation area	1749098	5586785

The summary of chemical analysis results for the quarterly samples taken from the five groundwater monitoring points is given in Table 3. Range and median (in brackets) values are given.

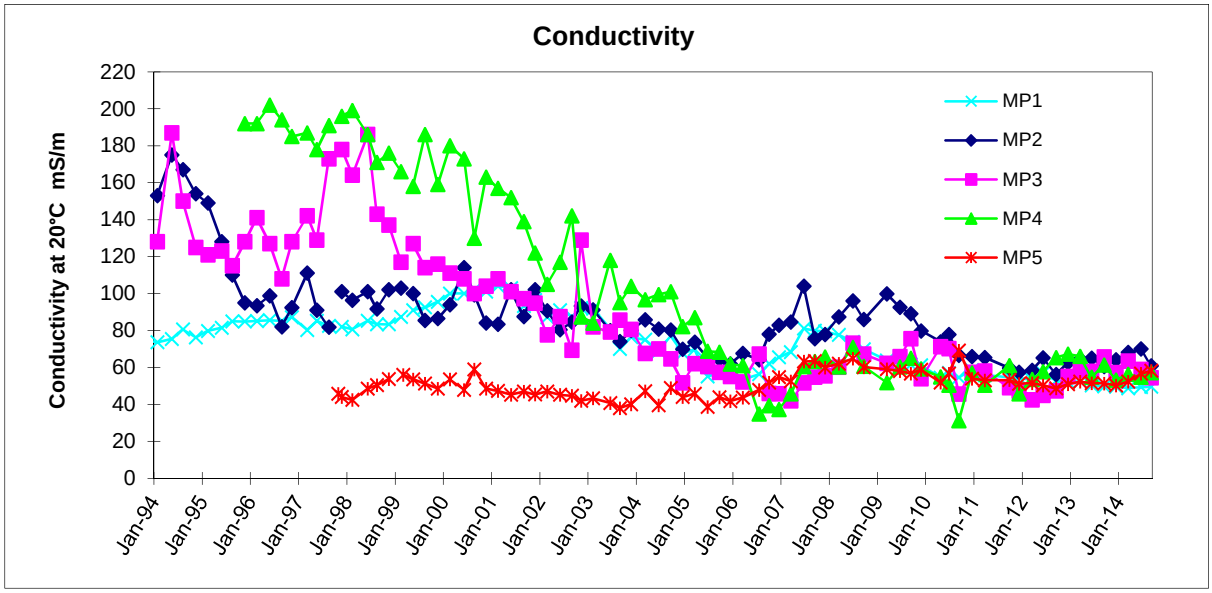
The parameters of most interest with regard to the operation of the wastewater disposal system and the monitoring of its effects on the surrounding environment are the nitrogen species (nitrate and ammonia), the organic strength (COD), and the mineral strength (conductivity). Figure 5 shows how the levels of conductivity, ammonia and nitrate, respectively, have varied through time for groundwater at the five monitoring points.

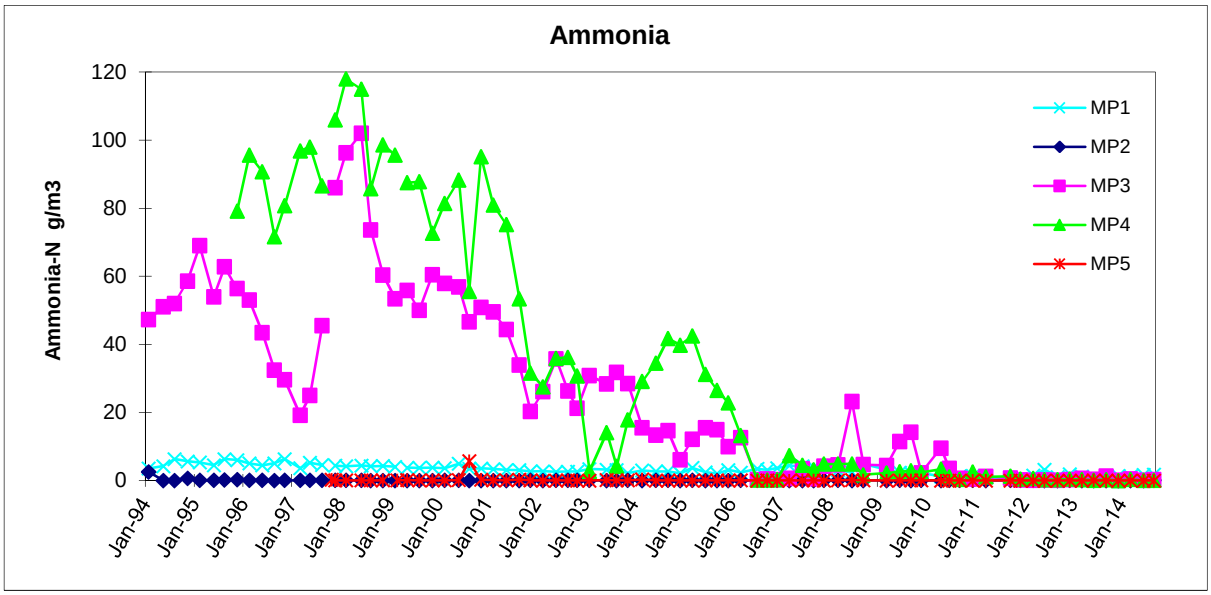
Table 3 Water quality results for monitoring bores, October 2012 – September 2014

Parameter	Unit	MP1 Spring by river	MP2 Below stage 2	MP3 Above stage 2	MP4 Beside wetland	MP5 Below stage 4
Water level	m	-	3.12 – 3.44 (3.31)	3.10 – 3.46 (3.35)	5.79 – 6.16 (6.04)	4.99 – 5.48 (5.30)
Temperature	°C	13.8 – 16.5 (15.3)	14.5 – 16.5 (15.6)	14.2 – 15.8 (14.8)	14.9 – 16.0 (15.0)	14.6 – 15.7 (15.1)
Conductivity, 20°C	mS/m	48.8 – 52.5 (49.7)	60.5 –70.0 (64.2)	54.5 – 65.7 (58.4)	53.2 – 67.2 (56.8)	50.3 – 58.2 (51.9)
pH	pH	7.3 – 7.5 (7.4)	7.2 – 7.5 (7.4)	7.4 – 7.6 (7.4)	7.5 – 7.6 (7.5)	7.5 – 7.7 (7.6)
COD	g/m³	8 – 17 (10)	5 – 24 (12)	5 – 18 (10)	10 – 21 (12)	<5 - 43 (<5)
Ammonia, total	g/m³N	0.43 – 1.83 (1.21)	0.008 – 0.066 (0.012)	0.066 – 1.32 (0.30)	0.014 – 0.41 (0.16)	<0.003 – 0.027 (0.006)
Nitrate + nitrite	g/m³N	3.1 – 5.6 (4.5)	9.2 – 19.9 (13.0)	1.03 – 12.3 (6.2)	2.9 – 13.4 (6.4)	5.4 – 9.1 (7.8)
Chloride	g/m³	32 – 42 (40)	18 – 38 (29)	47 – 74 (54)	38 – 84 (51)	28 – 39 (33)
Calcium	g/m³	58 – 64 (61)	80 – 96 (90)	78 – 95 (83)	73 – 87 (80)	77 – 92 (83)
Magnesium	g/m³	7.6 – 8.3 (7.9)	6.8 – 8.6 (7.6)	4.0 – 5.6 (4.6)	5.1 – 5.9 (5.4)	9.0 – 10.8 (9.6)
Potassium	g/m³	18 – 22 (19)	41 – 53 (47)	21 – 37 (27)	14 – 36 (23)	1.7 – 2.8 (1.8)
Sodium	g/m³	27 – 56 (31)	17 – 24 (22)	20 – 32 (27)	20 – 45 (32)	23 – 26 (25)

The spring water at MP1 is a combination of flows from deep and shallow aquifers. The deeper water is hard, as reflected in the high calcium and magnesium values. The shallow aquifer is more likely to be subject to the effects of activities at the surface, such as local farming, and particularly the irrigation of wastewater by SFF Waitotara. Since monitoring began in 1992, conductivity has risen and fallen twice over a range of up to two-fold, with peaks in the winters of 2001 and 2007. In 2012-2014, the nitrate concentration varied seasonally, with peaks in winter and troughs in summer, over the lowest range recorded, between 3.1 and 5.6 g/m³N.

The composition of groundwater 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 metres of sandy soil to the underlying water table. The levels of ammonia present are very low, indicating almost complete nitrification in aerobic soil. The most significant feature at MP2 is the nitrate concentration, which, after reaching a high of 124 g/m³N in June 1994, fluctuated between about 20 and 50 g/m³N. Over the 2010-2011 monitoring period nitrate concentration fell to 15 g/m³N in response to reduced irrigation volumes. The downward trend continued to 9 g/m³N in June 2013, after which time irrigation increased, with a corresponding increase to 20 g/m³N in June 2014.





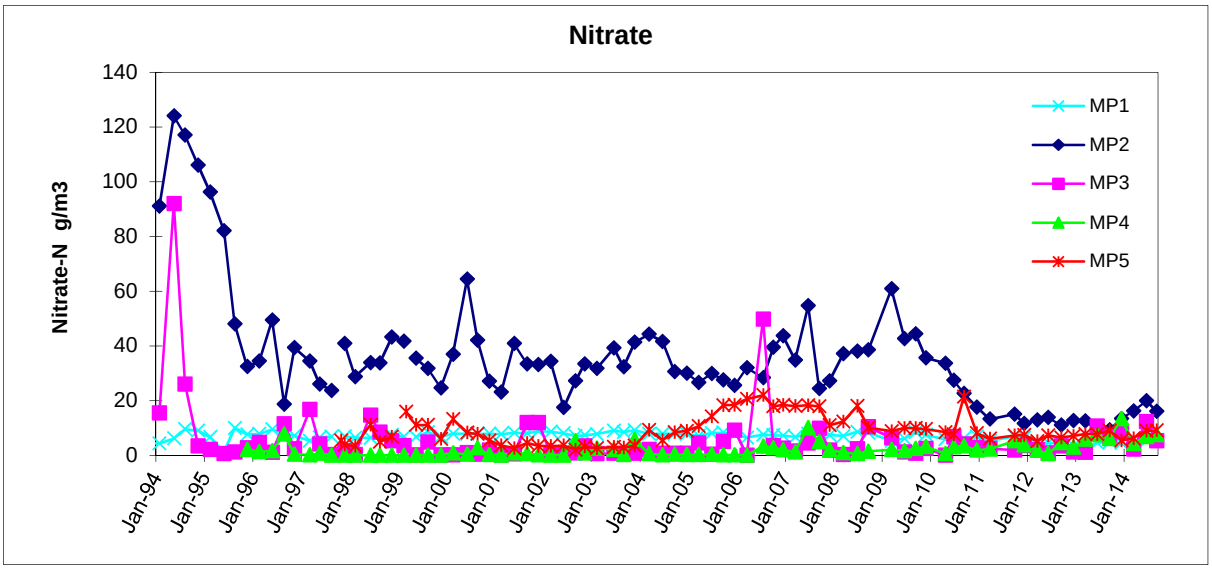


Figure 4 Conductivity, ammonia and nitrate at groundwater monitoring points, 1994-2014

At MP3, upgradient of stage 2 area, the effects of wastewater disposal via the old soakage trench and wetland have been apparent. Both mineral (conductivity) and organic (COD) component concentrations were elevated, but have fallen since peaking in the 1997-1998 year. The amount of ammonia present has continued to reduce significantly since 1998, which is attributed to no longer using the soakage trench and wetland 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. Nitrate concentrations have been relatively low, generally less than 4 g/m³N, from the period immediately after installation of the piezometer, as the lack of oxygen in the saturated soil has prevented nitrification. Since 2005, there have been occasional spikes in the nitrate level of up to about 10 g/m³N, with one value of 50 g/m³N recorded in July 2007. Since June 2013, nitrate concentration has lifted, with seasonal variation from 2 to 12 g/m³N, peaking in winter.

In the past, the effects of wastewater disposal have been recorded as being the greatest 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 effluent to the area ceased in 1999. Subsequently, nitrate concentrations were generally low, with occasional spikes, until winter 2006, since when levels have increased, to about 7 g/m³N in September 2014, with one spike of 13 g/m³N in December 2013.

Groundwater quality at MP5, downslope of the Stage 4 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/m³N) during that period. Post-irrigation, nitrate concentration increased from 2 g/m³N in 2002 to 22 g/m³N in 2006 then fell again from 2008, to about 7 g/m³ in 2010-2011. In the 2012-2014 monitoring period the levels of nitrate remained moderately low and the highest level recorded was 9.1 g/m³N.

Grass growth in the irrigation areas has been good, and is especially apparent when dry spells limit growth in adjoining non-irrigated areas. Monitoring in 2012-2014 showed grazing was well managed and it was noticeably greener than surrounds during dry periods.

2.1.3.3 Te Kiri o Rauru spring

When consent was sought from STDC 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 metres from the nearest part of the proposed wastewater application area.

In response, the Company 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. The spring constitutes seeps at the base of an 8-10 metre-high shellrock face over a distance of about 100 metres at the shore.

To provide comprehensive background information, a sample of the spring taken by the Company on 24 September 2012 was analysed by the Council for a wide range of

physico-chemical parameters. Another sample, taken on 16 December 2012 about 30 metres west of the first sampling site, which had been covered by sand, was analysed by Council for microbiological quality. The results are presented in Table 4.

Table 4 Chemical composition of Te Kiri o Rauru spring

Parameter	Units	24.09 12	16.12. 12
Conductivity	mS/m, 20°C	60.1	87.2
Turbidity	NTU	0.11	0.24
Chemical oxygen demand	g/m³	5	
pH	pH	7.9	8.2
Alkalinity, total	g/m³ $CaCO_3$	230	
Calcium	g/m³	92	
Magnesium	g/m³	10	
Sodium	g/m³	36	
Potassium	g/m³	2.7	
Bicarbonate	g/m³ HCO_3	280	
Chloride	g/m³	58	
Sulphate	g/m³	51	
Nitrate+Nitrite	g/m³N	1.44	
Ammonia, total	g/m³N	<0.003	
Nitrogen, total	g/m³N	1.48	
Phosphorus, dissolved reactive	g/m³P	0.043	
Phosphorus, total	g/m³P	0.043	
Iron, total	g/m³	<0.03	
Manganese, total	g/m³	<0.01	
Faecal coliforms	cfu/100ml		<1

The levels of potential contaminants from wastewater irrigation, coliforms and nitrate, were low. Subsequent samples taken by the Company 3-monthly have all had low total coliform (<1 cfu/100ml) and total nitrogen values (<5 g/m³) values, except for the sample taken on 14 September 2014, which had a total nitrogen of 7.4 g/m³. The next 3-monthly sample had a total nitrogen value of <5 g/m³.

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 effluent ponds, the effluent irrigation system, and miscellaneous plant processes. Routine inspections of the site were conducted on four occasions: 17 December 2012, 18 March, 14 June, 16 September and 16 December 2013, and 17 March, 23 June and 8 September 2014.

No offensive odour as a result of plant operation was found at the plant or irrigation area boundaries during the review period.

2.3 Investigations, interventions, and incidents

The monitoring programme for each year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the consent holder. During the year matters may arise which require additional activity by the Council eg 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 Taranaki Regional 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 Unauthorised Incident Register (UIR) includes events where the company 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).

In the 2012-2014 period, Council was required to undertake significant additional investigations and interventions, or record incidents, in association with SFF Waitotara's conditions in resource consents or provisions in Regional Plans on one occasion, following self-notification. On two other occasions, the Company notified Council of an incident that was not registered because of its minor nature. All three events occurred in 2014.

On 5 March 2014, the Company notified Council of a leak of effluent to land within the licensed irrigation area on Longview Farm. A wet area of ground was found that day around an unused irrigator hose connection valve that apparently had been partly opened by grazing cattle. No ponding occurred. The valve was removed the next day. The area was inspected during the routine Council visit on 17 March – some sediment was found around the valve site, and the grass was greener downslope for about 100 metres. No further action was taken by Council.

On 21 May 2014, the Company notified Council of foaming that had been discovered by a staff member earlier that morning in the stormwater drain along the road outside the meat plant. Photographs and an interim report were sent that day. A final written report on the incident (No. **30735)** was submitted two days later**.** The Company explained that there had been an inadvertent release of stormwater from a portable bund that may have contained a chlorinated caustic cleaning chemical that is used in meat processing areas. The results of pH testing of the drain and receiving tributary of Waitotara River (maximum pH of 8.25 in the drain was within the range limit on consent **5027-2**) and photographs of the amount of foam indicated that this was a minor event. Inspection by Council of the tributary on 24 May found no evidence of adverse effect. Preventative actions taken by the Company included review and update of the Stormwater Management Plan, retraining of staff, and greater emphasis on stormwater management in employee inductions. No further action was taken by Council.

On 25 August 2014, the Company took a routine 3-monthly sample of the discharge to the roadside stormwater drain in dry weather, which returned an oil and grease test result of 39 g/m^3, a factor of more than two-fold above the 15 g/m^3 limit. Council was informed, and told that there had been no visible sign of contamination in the sample. Suspended solids concentration was low, at <5 g/m^3. An investigation was carried out by the Company, which found one stormwater drain that could be "at risk" and was isolated until a permanent fix could be made. Other preventative actions included a check of vehicles on site in the Stormwater Audit, and increased checks in the stormwater catchment. The routine inspection by Council on 8 September found no obvious source of oil or grease contamination. Given the circumstances, of conflicting monitoring results with no adverse environmental effect found, no further action was taken by Council.

2.4 Annual reports by SFF Waitotara

SFF Waitotara produces an annual report on the monitoring programme associated with its resource consents.

2012-2013

The report for the period October 2012 to September 2013 was received on 28 March 2014.

In summary, the report states:

This report provides an overview of the environmental performance of discharges to land, air and water from activities undertaken at Silver Fern Farms Waitotara for 1st October 2012 to 30th September 2013.

A significant drought resulted in increased production, from farmers off-loading stock in order to mitigate shortages of water and feed. Increased production had a minimal effect on water consumption and wastewater generation.

Water take from the groundwater bores and spring are comparable to previous seasons despite increased production. Average water take during the processing season was 846 m^3 and well within the consented limit.

Wastewater quality was comparable to previous seasons. The addition of calf blood savings has resulted in reduction in nitrogen concentrations.

Wastewater is discharged to the land immediately surrounding the processing site and the neighbouring Longview Farm. Wastewater volumes are comparable to previous seasons despite the increase in production. Nitrogen loadings were 391 kgN/ha/y: the extension of irrigable area has ensured that adequate land is available to accommodate additional processing if required.

Stormwater management practices in place to control water quality have ensured stormwater, cooling water and defrost water discharge to a land drain that flows into the Waitotara River have met water quality targets. Furthermore, no adverse effects from the discharge have been observed during visual checks carried out on the tributary and river.

Groundwater quality is monitored by Taranaki Regional Council, the site were not notified of any significant changes in water quality.

No emissions to air from any of the activities undertaken at the site have been observed beyond the boundary of the property and no complaints have been received.

Overall it can be concluded that controls on discharges from Silver Fern Farms Waitotara activities are adequate and the current monitoring programme is suitable and effective.

2013-2014

The report for the period October 2013 to September 2014 was received on 24 December 2014.

In summary, the report states:

This report provides an overview of the environmental performance of discharges to land, air and water from activities undertaken at Silver Fern Farms Waitotara for 1st Octob er 2013 to 30th September 2014.

Water take from the groundwater bores and spring are comparable to previous seasons with a slight decrease on the previous year, this is largely due to the seasonal kill also being slightly down. Average water take during the processing season was 784m³ and well within the consented limit.

Wastewater quality and volumes were comparable to previous seasons with total nitrogen levels falling to an average of 251 kgN/ha/yr at Longview and 93 kgN/ha/yr at the Waitotara Plant. The reasons for this could be attributed to factors such as less stock units killed, improved savings of rendering material and blood plus the extension of irriogated land area available to accommodate the Waitotara Plants wastewater and associated Nitrogen loading. There was one incident during the year where there was wastewater last from the reticulation system when a Hydrant had been turned on by livestock, this hydrant was removed and Regional Council informed.

Stormwater from the Waitotara site catchment which also includes cooling water and defrost water from the Plant is monitored and managed to mitigate effects on the receiving environment, however there were two instances during the year when Stormwater consent conditions were breached, on both occasions corrective actions were taken and further preventative measures put in place to prevent reoccurrences. Inspection of the receiving environment at the time identified no adverse effects and investigation reports were provided to the Regional Council, there have been no reoccurrences.
Groundwater quality is monitored by the Taranaki Regional Council; the site was not notified of any significant changes in water quality. In addition to this groundwater from a spring on the Beach adjacent to the irrigation area is monitored by the company, this showed no indications that it was being influenced by the Wastewater irrigation.

No emission to air from any of the activitie undertaken at the site have been observed beyond the boundary of the property and no complaints have been received.

Overall it can be concluded that control of discharges from Silver Fern Farms Waitotara activities are adequate and the improved monitoring programme is suitable and effective.

3. Discussion

3.1 Discussion of plant performance

Inspections of the SFF Waitotara site during the 2012 -2014 review period found that the site was generally well managed and staff well trained. On no occasion were there items requiring action. The Company has a history of responding to and resolving any issues in a timely manner.

In September 2014, telemetry to Council was installed on measurement of water abstraction rates for individual bores and the spring. This will enable compliance with the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010, which apply to the Company from November 2014.

With regard to the discharge of stormwater and effluent, in general, the disposal systems were found to be operated and maintained in a satisfactory manner over the 2012-2014 period. There were two minor breaches of the consent to discharge stormwater and cooling water, for which appropriate corrective measures were taken. The discharge of emissions to air was also well managed throughout the monitoring period.

In September 2012, the Company commissioned a 20.7 ha extension of the area where travelling irrigators apply wastewater to land. A further extension, of the fixed sprinkler irrigation area by 6.0 ha, became operational in January 2013. Both areas were already covered by resource consent. This voluntary action, for which the Company was given an Environmental Award by Council (that was presented in November 2014), increased the area irrigated for wastewater disposal by 36% to 110.5 ha to provide for increased production at the meat processing plant and to lower Nitrogen loadings. Irrigation of the undeveloped areas will also increase pasture production. Average nitrogen loadings reduced from 349 kgN/ha/y in 2011-2012 to 223 kgN/ha/y in 2013-2014, a factor of 36%, though there was also a 4% reduction in kill.

Monitoring of Te Kiri o Rauru spring, situated over a kilometre downgradient of the irrigation extension, was established to satisfy concerns of tangata whenua.

3.2 Environmental effects of exercise of consents

No adverse effects on the surrounding environment, including effects on groundwater from the abstraction of water and discharge of stormwater and effluent at the SFF Waitotara site have been recorded during the 2012-2014 review period. This is consistent with the monitoring carried out in previous years, including sampling of the five groundwater monitoring points which confirmed that the effluent disposal system at the SFF Waitotara site is effectively managing the discharge of wastewater and stormwater from the site without adverse environmental effect, and that the volume of water being abstracted is within the limits of the resource consent.

In terms of environmental effects from the discharge of emissions to air, no offensive or objectionable odours were detected beyond the boundary of the site during inspections.

3.3 Evaluation of performance

A tabular summary of the Company's compliance record for the year under review is set out in Table 5 to Table 8.

Table 5 Summary of performance for Consent 2261-2 To take from three groundwater bores for meat processing operations

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Operate a measuring device to record daily rates of abstraction	Provision of groundwater abstraction data to the TRC.	Yes
2. Provision for water level and water quality sampling to be made at the bores	Chemical sampling	Yes
3. Optional review provision re environmental effects	Not scheduled for consideration during year under review. Consent expires June 2016.	N/A
Overall assessment of environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent t		High

N/A = not applicable

Table 6 Summary of performance for Consent 2260-2 To discharge wastes by spreading to land and by spray irrigation for meat processing operations

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Discharge to occur in accordance with Management Plan	Site inspections and data provided. Plan updated 21 September 2011	Yes
2. No offensive or objectionable odour beyond the boundary of the property	Site inspections and complaints register	Yes
3. Discharge not to result in spray drift beyond the boundary of the property	Site inspections and complaints register	Yes
4. No effects upon ground water	Site inspections and chemical sampling. Minor effects	No
5. Review of management plan	Not exercised	N/A
6. Review of consent conditions	Not scheduled for consideration during year under review. Consent expires June 2016.	N/A
Overall assessment of environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

Table 7 Summary of performance for Consent 5027-2 To discharge stormwater, defrost water and evaporative cooling water 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

Condition requirement	Means of monitoring during period under review	Compliance achieved?
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	No, one breach of oil & grease limit
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 23 March 2011.	Yes
7. Provide and maintain a stormwater management plan	Council records and site inspecitons. Plan updated 23 March 2011.	Yes
8. Notification on changes on site	No required during monitoring period	N/A
9. Review of consent conditions	Not scheduled for consideration during year under review. Next consideration June 2016.	N/A
Overall assessment of environmental performance in respect of this consent		Good
Overall assessment of administrative performance in respect of this consent		High

Table 8 Summary of performance for Consent 4629-2 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. Best practicable option	Site inspections	Yes
2. No odour beyond boundary of the site	Site inspections and complaints register	Yes
3. Detail emissions from the site	Information not requested by TRC	N/A
4. Discharge to be smoke free	Site inspections	Yes
5. Review of consent conditions	Not scheduled for consideration during year under review. Consent expires June 2016.	N/A
Overall assessment of environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

During the 2012-2014 monitoring period, the Company demonstrated a high level of environmental and high level of administrative performance and compliance with its resource consents as defined in Section 1.1.4. A significant improvement was made to the wastewater disposal system in spring/summer of 2012-2013 by a 36% increase to the irrigation area.

3.4 Recommendations from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

1. THAT monitoring of air emissions from the meat processing operations of Silver Fern Farms Limited (Waitotara) in the 2012-2013 year continues at the same level as in 2011-2012.

2. THAT monitoring of discharges of stormwater and effluent from the meat processing operations of Silver Fern Farms Limited (Waitotara) in the 2012-2013 year continues at the same level as in 2011-2012.

3. THAT monitoring of water abstraction for the meat processing operations of Silver Fern Farms Limited (Waitotara) in the 2012-2013 year continues at the same level as in 2011-2012.

These recommendations were implemented during the period under review.

3.5 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/water discharges in the region, the Taranaki Regional Council has taken into account the extent of information made available by previous authorities, its relevance under the Resource Management Act, the obligations of the Act in terms of monitoring emissions/discharges and effects, and subsequently reporting to the regional community, 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 emitting to the atmosphere/discharging to the environment.

In the case of SFF Waitotara, the programme for 2013-2014 was unchanged from that for 2012-2013. It is similarly proposed that for 2014-2015, the monitoring programme remain the same as the previous monitoring period. A recommendation to this effect is attached to this report.

3.6 Exercise of optional review of consents

None of the consents allow for an optional review in June 2015.

4. Recommendations

1. THAT monitoring of air emissions from the meat processing operations of Silver Fern Farms Limited (Waitotara) in the 2014-2015 year continues at the same level as in 2013-2014.

2. THAT monitoring of discharges of stormwater and effluent from the meat processing operations of Silver Fern Farms Limited (Waitotara) in the 2014-2015 year continues at the same level as in 2013-2014.

3. THAT monitoring of water abstraction for the meat processing operations of Silver Fern Farms Limited (Waitotara) in the 2014-2015 year continues at the same level as in 2013-2014.

Glossary of common terms and abbreviations

The following abbreviations and terms are 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
Condy	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m
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
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)
NO_3	Nitrate, normally expressed in terms of the mass of nitrogen (N)
NNN	Nitrate plus nitrite, expressed in terms on 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 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
Temp	Temperature, measured in °C (degrees Celsius)
UI	Unauthorised Incident

UIR	Unauthorised 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

For further information on analytical methods, contact the Council's laboratory.

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Appendix I

Resource consents held by Silver Fern Farms Limited (Waitotara)

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 P O Box 941 DUNEDIN
Consent Granted Date:	2 July 1998

Conditions of Consent

Consent Granted:	To discharge up to 1700 cubic metres/day of a) waste by spreading onto land; and b) wastewater by spray irrigation onto land; from meat processing operations in the vicinity of the Waitotara River at or about (NZTM) 1748161E-5588686N	
Expiry Date:	1 June 2016	
Review Date(s):	June 2004, June 2010	
Site Location:	Waiinu Beach Road Waitotara	
Legal Description:	Consent Holder:	Lot 1 DP 63598 Lot 1 DP 75951 Blk XIV Wairoa SD
	A V Pearce:	Pt Sec 49, 49A Waitotara Dist Blk XIV Wairoa SD
	DV & JV Pearce:	Pt Sec 92, 149, 153 Waitotara Dist Pt Sec 3, 10 Sec 1, 5, 6 Blk XIV Wairoa SD
Catchment:	Waitotara	

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

General conditions

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

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

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

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

Special conditions

1. That the discharge shall occur in accordance with the provisions of the Management Plan for the Treatment of Meat Processing Plant Effluent [May 1998] supplied with the application or a plan modified by agreement between the consent holder and the Chief Executive, Taranaki Regional Council, which addresses the following matters:

a) effluent application rate and method;
b) pasture and soil husbandry;
c) prevention of run-off and spray drift;
d) effluent, soil and groundwater monitoring;
e) contingency events;
f) reporting.

2. That the discharge shall not result in offensive or objectionable odour levels beyond the boundary of the property.

3. That the discharge shall not result in spray drift beyond the boundary of the property.

4. That the consent holder shall manage the discharge in such a manner as to minimise impacts on groundwater quality.

5. That the Taranaki Regional Council or the consent holder may review the management plan, referred to in condition 1, at any time by giving at least three months written notice, for the purpose of establishing the adequacy of the plan in dealing with any adverse effects on the environment.

6. That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2004 and/or June 2010, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the discharge 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 3 June 2008

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Water Permit

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

Name of Consent Holder:	Silver Fern Farms Limited P O Box 941 DUNEDIN
Consent Granted Date:	23 January 1998

Conditions of Consent

Consent Granted:	To take up to 1300 cubic metres/day [17.6 litres/second] of water from three groundwater bores in the vicinity of the Waitotara River for meat processing purposes at or about (NZTM) 1748161E-5588686N
Expiry Date:	1 June 2016
Review Date(s):	June 2004, June 2010
Site Location:	Waiinu Beach Road Waitotara
Legal Description:	Lot 1 DP 63598 Pt Sec 49 SO Plan 34844 Blk XIV Wairoa SD
Catchment:	Waitotara

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

General conditions

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

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

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

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

Special conditions

1. That the consent holder shall operate a measuring device capable of recording daily rates of abstraction from each bore and shall make such records available to the Taranaki Regional Council upon request.

2. That provision at the headworks of the bores for water-level measurements and water quality sampling shall be made and be maintained.

3. That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2004 and/or June 2010, for the purpose of ensuring that the 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 3 June 2008

For and on behalf of
Taranaki Regional Council

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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 P O Box 941 DUNEDIN
Consent Granted Date:	23 January 1998

Conditions of Consent

Consent Granted:	To discharge emissions into the air from various activities associated with meat processing operations at or about (NZTM) 1748161E-5588686N
Expiry Date:	1 June 2016
Review Date(s):	June 2004, June 2010
Site Location:	Waiinu Beach Road Waitotara
Legal Description:	Lot 1 DP 75951 Lot 1 DP 63598 Pt Secs 153, 7, 92 & SO Plan 34844 Pt Sec 14, 9, 49 Waitotara Dist Blk XIV Wairoa SD

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

General conditions

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

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

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

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

Special conditions

1. That the consent holder shall adopt the best practicable option or options to prevent or minimise the adverse effects of the discharges on the environment.

2. That at no time shall the consent holder cause or allow an odour at or past the legal boundary of the consent holder's site that in the opinion of at least one enforcement officer of the Taranaki Regional Council is noxious or offensive or objectionable.

3. That the consent holder shall detail emission inventories from the site upon the request of the Taranaki Regional Council.

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

5. That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2004 and/or June 2010, for the purpose of ensuring that the 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 3 June 2008

For and on behalf of
Taranaki Regional Council

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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 P O 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 at or about (NZTM) 1748084E-5589290N
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	Waiinu Beach Road, Waitotara
Legal Description:	Lot 1 DP 63598 [Discharge source & site] Sec 81 Blk XIII XIV Wairoa SD [Discharge site]
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 [the Council] all the administration, monitoring and supervision costs of this consent, fixed in accordance to section 36 of the Resource Management Act.

Special conditions

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

Signed at Stratford on 8 November 2010

For and on behalf of
Taranaki Regional Council

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Director-Resource Management