Ballance Agri-Nutrients (Kapuni) Ltd Monitoring Programme Annual Report 2012-2013

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Executive summary

Ballance Agri-Nutrients (Kapuni) Ltd (Ballance) operates an ammonia urea manufacturing plant located near Kapuni, in the Kapuni Stream catchment. This report for the period July 2012-June 2013 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 effects of Ballance's activities.

The Company holds a total of seven resource consents, which include a total of 74 conditions setting out the requirements that the Company must satisfy. The Company holds resource consents to allow it to take from the Waingongoro River, the Kapuni Stream and from the groundwater; to discharge to land and to the Kapuni Stream; and to discharge emissions into the air. All of the consents expired in June 2011. The consent to emit to air was replaced in February 2012, and the other six consents were replaced in August 2012.

Ballance and the Council monitor the exercise of the resource consents. The monitoring programme includes site inspections, sampling of effluent, discharge and receiving waters (both ground and surface) for physicochemical analysis, and biological survey of affected streams. Particular attention is paid to the management of the irrigation disposal system, and its effects on groundwater quality.

The Council's monitoring programme included four inspections, 12 water samples collected for physicochemical analysis, and three air quality surveys.

Abstraction volumes from Waingongoro River complied with the increased consent limit. A required investigation into effects of the take on juvenile fish entrainment, and appropriate future monitoring, was initiated. A contribution of $30,000 towards riparian planting and management in Waingongoro catchment was made under the new consent, the first of ten annual payments.

The groundwater monitoring indicates the presence of elevated nitrate concentrations in shallow groundwater. This is in part a result of heavy applications of nitrogen (effluent) early in the life of the plant. Current effluent application is considerably lower than previous application rates. However nitrate concentrations in the soil profile underneath the irrigation areas remain elevated.

A narrow but concentrated plume of ammonia is present in the groundwater and extends from a previous leak in an effluent storage basin. This basin has since been repaired. A second more recent and more concentrated ammonia plume extends from the plant area. Both plumes have pump and treatment systems operating, with the contaminated groundwater pumped back through the plant and waste treatment system. Both plumes currently do not extend beyond the Ballance site and are monitored.

Monitoring of the Kapuni Stream and its tributaries around the plant, through testing for nitrogen, as well as bio-monitoring involving macroinvertebrate and fish surveys, has not detected any detrimental impact on the stream caused by discharges from the Ballance site.

Air monitoring of the site and the neighbourhood shows no significant impact on the surrounding environment in relation to the operation of the ammonia urea plant. In compliance with the new air consent, two stations for monitoring of ammonia concentration were established on the site boundary to determine long-term trends.

During the monitoring period, four unauthorised incidents were reported to the Council, all by Ballance in relation to air, one of which was unfounded due to sampling error. Immediate action was taken by the Company in each case to stop any potential offsite effects, followed by an investigation into the cause of these releases and preventative actions put in place.

Overall, during the year under review, Ballance demonstrated a good level of environmental performance and compliance with its resource consents. However, with regard to emissions to air, an improvement in the Company's performance is desirable.

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.

This report includes recommendations for the 2013-2014 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 combined annual reports for the period July 2012-June 2013 by the Taranaki Regional Council (the Council) on the monitoring programme associated with the resource consents held by Ballance Agri-Nutrients (Kapuni) Ltd (Ballance). The Company operates an ammonia urea plant (the AUP) situated on Palmer Road, Kapuni, in the Kapuni catchment.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by Ballance that relate to abstractions of water in the Waingongoro and Kapuni catchments and discharges of water and effluent within the Kapuni catchment, and the air discharge permit held by Ballance 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 Company's use of water, land, and air, and is the twentieth combined annual report by the Council for the Company, and includes the twenty-fifth report on the effects to water.

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 Ballance, the nature of the monitoring programme in place for the period under review, and a description of the activities and operations conducted by Ballance at the Kapuni 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 2013-2014 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 (e.g. 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 discharge source. 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 against regional plans and consents. Compliance monitoring, (covering both activity and impact) monitoring, also 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 the Company during the period under review, this report also assigns an overall rating. The categories used by the Council, and their interpretation, are as follows:

- A **high** level of environmental performance and compliance indicates that essentially there were no adverse environmental effects to be concerned about, and no, or inconsequential non-compliance with conditions.

- A **good** level of environmental performance and compliance indicates that adverse environmental effects of activities during the monitoring period were negligible or minor at most, or, 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, or, there were perhaps some items noted on inspection notices for attention but these items were not urgent nor critical, and follow-up inspections showed they have been dealt with, and any inconsequential non compliances with conditions were resolved positively, co-operatively, and quickly.

- **Improvement required (environmental)** or **improvement required (administrative compliance)** (as appropriate) indicates that the Council may have been obliged to record a verified unauthorised incident involving measurable environmental impacts, and/or, there were measurable environmental effects arising from activities and intervention by Council staff was required and there were matters that required urgent intervention, took some time to resolve, or remained unresolved at the end of the period under review, and/or, there were on-going issues around meeting resource consent conditions even in the absence of environmental effects. Abatement notices may have been issued.

- **Poor performance (environmental)** or **poor performance (administrative compliance)** indicates generally that the Council was obliged to record a verified unauthorised incident involving significant environmental impacts, or there were material failings to comply with resource consent conditions that required significant intervention by the Council even in the absence of environmental effects. Typically there were grounds for either a prosecution or an infringement notice.

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.

1.2 Process description

The ammonia-urea plant was commissioned in November 1982. The plant utilises specification gas from the Taranaki Fields. This gas is supplied for both fuel and process.

The feed gas is treated in a de-sulphuriser and then mixed with superheated steam for reaction in the steam methane reformer. The synthesis gas mixture consists of hydrogen, carbon dioxide, and carbon monoxide. The reformer is heated by burning fuel gas. The waste gases from combustion are used to generate steam, before discharging to the atmosphere, to increase efficiency and reduce fuel consumption. The synthesis gas mixture is reacted with air in a secondary reformer, a process that releases heat and requires no fuel. The heat is recovered for steam generation. A shift converter adjusts the synthesis gas mixture, before carbon dioxide is removed by absorption into an amine solution. This solution is regenerated by heating, which drives off the dissolved carbon dioxide. The carbon dioxide is sent to the urea plant for utilisation in the urea manufacturing process. Meanwhile, the synthesis gas is reacted to form ammonia. Non-utilisable by-product gases are burnt as fuel.

The ammonia and the carbon dioxide are combined in the urea formulation process. Off-gases are absorbed in scrubbers. The urea is formed into granules utilising air fluidised-bed granulation. Following this the product is screened and air-cooled.

The normal discharges and emissions from the AUP are listed in Table 1.

In the 2012-2013 monitoring year, Ballance produced approximately 243,841 tonnes of urea from the Kapuni site. This was an increase of 127% over production in the 2011-2012 year (107,391 tonnes), during which there were extended plant outages following a fire and a scheduled maintenance turnaround.

Photo 1 Ballance Agri-Nutrients ammonia urea plant (viewed looking towards the north-west)

Table 1 Discharges and emissions from the ammonia urea plant

Discharges	Resource consent	Source	Constituents	Rate
Discharges to land	0597	Discharge of plant production effluent and contaminated stormwater by way of spray irrigation to pasture	Primarily ammonia, urea and nitrate. Also contains cooling water blow down	Up to 1,470 m^3/day
	7751	Domestic sewage via soakage trenches	Treated sewage effluent	Up to 28 m^3/day
Discharges to water	0598	Uncontaminated stormwater, and raw water treatment effluent, to the Kapuni Stream and an unnamed tributary of the Kapuni Stream	Major cations (particularly sodium) and accumulated particulate material	Up to 1,920 m^3/day to the Kapuni Stream. Up to 4,080 m^3/day to an unnamed tributary of the Kapuni Stream
	1766	Contingency discharge of treated plant effluent and contaminated stormwater	Primarily ammonia, urea and nitrate. Also contains cooling water blow down	Up to 1,000 m^3/day to the Kapuni Stream when conditions do not allow spray irrigation
Emissions to air	4046	Reformers and de-sulphuriser heater	Carbon dioxide, nitrogen oxides, water vapour	Nitrogen oxides about 300 kg/hr
		Alkanolamine stripper	Carbon dioxide	16,000 kg/hr for short periods
		Cooking tower	Water vapour and droplets, traces of water treatment chemicals	
		Urea granulation process	Urea dust, ammonia	Less than 5 kg/hr
		Ammonia recovery process vent	Ammonia	Less than 3 kg/hr
		Ammonia finishing absorber	Ammonia	Less than 3 kg/hr
		Pressure relief valves	Ammonia	Infrequent (abnormal process event)

1.3 Resource consents

Ballance holds seven resource consents for the operation of the AUP. The purpose of the resource consents are summarised in Table 2. Further detail is provided in Sections 1.3.1 to 1.3.4. Copies of the resource consents are included in Appendix I.

Table 2 Resource consents for operation of ammonia urea plant

Resource consent	Purpose	Volume (m^3/day)	Next review date	Expiry date
0596-3	Abstract water from Waingongoro River	4,000	2017	2035
1213-3	Abstract water from Kapuni Stream during emergencies	950	2017	2035
0597-3	Discharge plant production effluent and contaminated stormwater by way of irrigation onto pastureland	1,470	2017	2035
0598-3	Discharge uncontaminated stormwater and raw water treatment plant wastewater to Kapuni Stream	1,920	2017	2035
	or tributary of Kapuni Stream during high flows	4,080		
1766-3	Discharge treated effluent and stormwater to Kapuni Stream when conditions do not allow irrigation onto land	1,000	2017	2035
4719-2	Take groundwater for site remediation purposes	200	2017	2035
4046-3	Discharge of emissions to air from the manufacturing of ammonia and urea	N/A	2017	2035
7751-0	Discharge treated domestic wastewater to groundwater via soakage trenches	-		

All of the eight consents associated with operation of the ammonia urea plant expired on 1 June 2011. Applications for replacement of seven of the consents were lodged on 25 November 2010. Consent **4046** to discharge emissions to air was replaced in February 2012. The other six applications were approved in August 2012.

The consents that were replaced remained in force while the applications for new consents were being processed (as provided for under section 124 of the RMA).

Consent **3967** was not replaced, as the activity it allowed had become permitted under the Regional Freshwater Plan that was promulgated in October 2001. Certificate of compliance **7751** was issued instead in December 2010.

The resource consents are subject to conditions on abstraction and discharge rates, effluent compositions and receiving water effects, and implementation of management plans. There is provision of six-yearly reviews of resource consent conditions from 1 June 2017.

1.3.1 Water abstraction permit

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.

Ballance held six permits to abstract water during the 2012-2013 review period. Water permits **0596-2**, **1213-2** and **4719-1** expired and were replaced with water permits **0596-3**, **1213-3** and **4719-2**.

1.3.1.1 Waingongoro River

Ballance Agri-Nutrients (Kapuni) Ltd held water permit **0596-2** to take up to 3,456 cubic metres/day of water from the Waingongoro Stream at a maximum rate of 100 litres/second for operation purposes at the ammonia/urea plant. This consent was issued by the Taranaki Regional Council on 23 September 1991 under Section 21 (c) of the Water and Soil Conservation Act, 1967 and was deemed to be an existing right under section 386 (1) (e) (i) of the RMA. It expired on 1 June 2011, but remained in force while application for a new consent was being processed.

There were three special conditions attached to this permit.

Condition 1 was a review provision.

Condition 2 required the intake structure to be designed to minimise effects on the river bed and banks, as well as to avoid effects on fish life.

Condition 3 required remedial works to be undertaken in the event that the intake structure damages the banks of the stream or the stream channel.

Ballance Agri-Nutrients (Kapuni) Ltd holds water permit **0596-3** to take water from the Waingongoro River for operation of an ammonia/urea plant. This consent was issued by the Taranaki Regional Council on 31 August 2012 under Section 87 (d) of the RMA. It is due to expire on 1 June 2035.

There are fifteen special conditions attached to this permit.

Condition 1 limits the volume of water taken to 4,000 cubic metres/day.

Conditions 2 to 6 address the measurement and recording of abstraction.

Condition 7 requires the adoption of the best practicable option to prevent or minimise adverse effects on the environment, including the efficient and conservative use of water.

Condition 8 controls any modifications to the intake.

Condition 9 requires a report on the costs and benefits of altering the intake to minimise the entrainment of juvenile fish.

Conditions 10 to 12 address monitoring of environmental effects and consultation with interested parties.

Condition 13 requires financial contribution towards riparian planting and management in Waingongoro catchment.

Conditions 14 and 15 are review provisions.

Copies of the permits are attached to this report in Appendix I.

1.3.1.2 Kapuni Stream

Ballance also held water permit **1213-2** to take up to 33 litres/second of water from the Kapuni Stream to supply the ammonia/urea plant during emergencies when the normal supply from the Waingongoro Stream has failed. This consent was issued by the Taranaki Regional Council on 23 September 1991 under Section 21 (c) of the Water and Soil Conservation Act, 1967 and was deemed to be an existing right under section 386 (1) (e) (i) of the Resource Management Act, 1991. It expired on 1 June 2011, but remained in force while application for a new consent was being processed.

This permit was changed on 12 November 2007 to allow an increase in maximum abstraction rate from 11 to 33 litres/second in order to enable the plant to keep running rather than have to shut down upon failure of the normal supply. This followed the first exercise of the permit, on 5/6 July 2007, when the allowed maximum abstraction rate was exceeded.

The special conditions were changed to ensure that the consent is exercised for as short a time as is necessary.

Condition 1 defined maximum abstraction rate.

Condition 2 (new) required reinstatement of normal water supply as soon as was practically achievable.

Condition 3 addressed notification of and reporting on exercise of consent. Progress reports were required if reinstatement of normal supply took longer than five days.

Condition 4 dealt with flow measurement.

Ballance Agri-Nutrients (Kapuni) Ltd holds water permit **1213-3** to take and use water from the Kapuni Stream (at times when the normal water supply has failed) for operation of an ammonia/urea plant. This consent was issued by the Taranaki Regional Council on 31 August 2012 under Section 87 (d) of the RMA. It is due to expire on 1 June 2035.

There are six special conditions attached to this permit.

Condition 1 limits the volume of water taken to 33 litres/second.

Condition 2 authorises taking only at times when the supply under consent **0596-3** has failed.

Condition 3 addresses measurement, recording and reporting of abstraction.

Condition 4 requires the adoption of the best practicable option to prevent or minimise adverse effects on the environment, including the efficient and conservative use of water.

Condition 5 deals with notification of and reporting on exercise of consent.

Condition 6 is a review provision.

The permits are attached to this report in Appendix I.

1.3.1.3 Groundwater

Ballance also held a water permit for the abstraction of groundwater. Permit **4719-1** allowed for the abstraction of up to 200 cubic metres/day (8.8 litres/second) of water from a series of groundwater bores at the ammonia/urea plant for operation and remediation purposes in the Kapuni Catchment. This permit was issued by the Taranaki Regional Council on 8 September 1995 under Section 87 (d) of the RMA. It expired on 1 June 2011 but remained in force while application for a new consent was being processed.

Permit **4719-1** ha*d* two special conditions attached to it.

Condition 1 set out the need to notify the Council prior to abstraction of water from any new groundwater bore(s).

Condition 2 was a review provision.

Ballance Agri-Nutrients (Kapuni) Ltd holds water permit **4719-2** to take and use groundwater from the Kapuni Stream (catchment) for industrial site remediation and process use purposes. This consent was issued by the Taranaki Regional Council on 31 August 2012 under Section 87 (d) of the RMA. It is due to expire on 1 June 2035.

There are four special conditions attached to this permit.

Condition 1 limits the volume of water taken to 200 cubic metres/day.

Condition 2 addresses measurement, recording and reporting of abstraction.

Condition 3 requires the adoption of the best practicable option to prevent or minimise adverse effects on the environment, including the efficient and conservative use of water.

Condition 4 is a review provision.

The permits are attached to this report in Appendix I.

1.3.2 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.

Ballance held four permits to discharge to water during the 2012-2013 review period. Discharge permits **0598-2** and **1766-2** expired and were replaced with discharge permits **0598-3** and **1766-3**.

1.3.2.1 Stormwater

Ballance held water discharge permit **0598-2**, which allowed for the discharge of a total of up to 6,000 cubic metres/day of uncontaminated stormwater and raw water treatment plant wastewater from the ammonia/urea plant: a) to the Kapuni Stream at a rate of up to 1,920 cubic metres/day; and b) to an un-named tributary of the Kapuni Stream at a rate of up to 4,080 cubic metres/day when discharge rate to the Kapuni Stream exceeds 1,920 cubic metres/day.

This permit was issued by the Taranaki Regional Council on 23 September 1991 under Section 21 (c) of the Water and Soil Conservation Act, 1967 and was deemed to be an existing right under section 386 (1) (e) (ii) of the RMA. It expired on 1 June 2011, but remained in force while application for a new consent was being processed.

Discharge permit **0598-2** had a total of thirteen special conditions which related to the discharge of stormwater and wastewater.

Condition 1 was a review provision.

Condition 2 set limits on the components of the discharge.

Condition 3 and 4 placed limits on the concentration of ammonia and sodium outside of the discharge mixing zone.

Condition 5 required the consent holder to monitor the stream for levels of ammonia, sodium and pH.

Condition 6 requires the Company to minimise the discharge of free phosphate.

Condition 7 stipulated that the discharge shall not have an adverse effect on the freshwater ecology of the stream.

Condition 8 required the discharge structure to be designed to minimise effects on the river bed and banks, as well as to avoid effects on fish life.

Condition 9 required remedial works to be undertaken in the event that the discharge structure damages the banks of the stream or the stream channel.

Condition 10 required the discharge to be undertaken in accordance with an effluent management plan.

Condition 11 allowed for the review of the management plan.

Conditions 12 and 13 provided for reviews of the consent conditions.

Ballance holds water discharge permit **0598-3**, which allows for the discharge of stormwater from non-process area, and raw water treatment plant wastewater, from an ammonia/urea plant to the Kapuni Stream and into an unnamed tributary of the Kapuni Stream. This consent was issued by the Taranaki Regional Council on 31 August 2012 under Section 87 (e) of the RMA. It is due to expire on 1 June 2035.

Discharge permit **0598-3** has a total of twelve special conditions which relate to the discharge of stormwater and wastewater.

Condition 1 limits discharge volumes.

Condition 2 requires the adoption of the best practicable option to prevent or minimise adverse effects on the environment.

Conditions 3 and 4 set limits on constituents in the discharge and beyond a defined mixing zone downstream, while condition 5 describes effects which must not arise beyond the mixing zone.

Condition 6 addresses monitoring for compliance with condition 4 on constituents in Kapuni Stream.

Condition 7 requires the Company to minimise the discharge of free phosphate.

Conditions 8 to 10 require the discharge to be undertaken in accordance with an effluent management plan, and the production and review of the plan.

Conditions 11 and 12 are review provisions.

The permits are attached to this report in Appendix I.

1.3.2.2 Contingency discharges

Ballance held water discharge permit **1766-2** to discharge up to 1,000 cubic metres/day of treated plant production effluent and contaminated stormwater from an ammonia/urea plant to the Kapuni Stream when conditions do not allow spray irrigation to occur.

This permit was issued by the Taranaki Regional Council on 23 September 1991 under Section 21 (c) of the Water and Soil Conservation Act, 1967 and was deemed to be an existing right under Section 386 (1) (e) (ii) of the RMA. It expired on 1 June 2011, but remained in force while application for a new consent was being processed.

There were eight conditions associated with this consent which set out how the consent shall be operated and managed.

Condition 1 was a review provision.

Condition 2 set out the terms of use of the consent during heavy rainfall only.

Condition 3 set limits on the components of the discharge.

Conditions 4 and 5 placed limits on the concentration of ammonia and nitrite outside of the discharging mixing zone.

Condition 6 stipulated that the discharge shall not have an adverse effect on the freshwater ecology of the stream.

Condition 7 required the discharge to be undertaken in accordance with an effluent management plan.

Condition 8 allowed for the review of the management plan.

Ballance holds water discharge permit **1766-3** to discharge treated plant production effluent and contaminated stormwater from an ammonia/urea plant to the Kapuni Stream when wet ground conditions do not allow spray irrigation onto and into land. This consent was issued by the Taranaki Regional Council on 31 August 2012 under Section 87 (e) of the RMA. It is due to expire on 1 June 2035.

There are ten conditions associated with this consent which set out how the consent shall be operated and managed.

Condition 1 places restrictions on when consent can be exercised.

Condition 2 limits discharge volume.

Condition 3 requires the adoption of the best practicable option to prevent or minimise adverse effects on the environment.

Conditions 4 and 5 set limits on constituents in the discharge and beyond a defined mixing zone downstream, while condition 6 describes effects which must not arise beyond the mixing zone.

Conditions 7 to 9 require the discharge to be undertaken in accordance with an effluent management plan, and the production and review of the plan.

Condition 10 is a review provision.

The permits are attached to this report in Appendix I.

1.3.3 Discharge to land permits

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.

Ballance held two resource consents for discharge to land during the 2012-2013 review period. Discharge permit **0597-2** expired and was replaced with discharge permit **0597-3**.

1.3.3.1 Process wastewater

Ballance held discharge permit **0597-2,** which allowed for the discharge of treated plant production effluent and contaminated stormwater from an ammonia/urea plant by spray irrigation onto and into land. This permit was issued by the Taranaki Regional Council on 23 September 1991 under Section 21 (c) of the Water and Soil Conservation Act, 1967 and was deemed to be an existing right under Section 386 (1) (e) (ii) of the RMA. It expired on 1 June 2011, but remained in force while application for a new consent was being processed.

Consent **0597-2** had a total of fourteen special conditions which related to the method and management of disposal of stormwater to minimise effects on the surrounding environment.

Condition 1 required the adoption of the best practicable option.

Condition 2 required a management plan to be provided to the Council which addressed the method and rate of effluent application as well as monitoring that would be undertaken.

Condition 3 required the activity to be carried out in accordance with the procedures set out in the spray irrigation management plan.

Condition 4 required the consent holder to review the management plan annually.

Conditions 5 and 7 required that the discharge did not result in offensive odour, or spray drift beyond the boundary of the property.

Condition 6 limited the effluent application rate.

Condition 8 specified the spray zone requirement.

Condition 9 specified the nitrogen loading rate.

Conditions 10 and 11 required the consent holder to forward water treatment and chemical cleaning programmes to the Council for review, and also required notifying the Council if there was a change in the way that water was treated or chemical cleaning was carried out.

Conditions 12 and 14 were review provisions.

Condition 13 was the consent lapse date.

Ballance holds discharge permit **0597-3,** which allows for the discharge of treated plant production effluent and contaminated stormwater from an ammonia/urea plant by spray irrigation onto and into land.

This consent was issued by the Taranaki Regional Council on 31 August 2012 under Section 87 (e) of the RMA. It is due to expire on 1 June 2035.

Consent **0597-3** has a total of fourteen special conditions which relate to the method and management of disposal of wastewater to minimise effects on the surrounding environment.

Condition 1 defines the area of land where discharge is authorised.

Condition 2 limits the volume discharged.

Condition 3 requires the adoption of the best practicable option.

Condition 4 requires maximisation of discharge to land, rather than to Kapuni Stream under consent **1766-3**.

Conditions 5 to 7 require the discharge to be undertaken in accordance with an effluent management plan, and the production and review of the plan.

Conditions 8 and 9 require that the discharge not result in offensive odour or spray drift beyond the boundary of the property, while condition 10 specifies spray zones.

Condition 11 sets limits on nitrogen loading rate.

Conditions 12 and 13 deal with water treatment and cleaning chemicals.

Condition 14 is a review provision.

The permits are attached to this report in Appendix I.

1.3.3.2 Domestic wastewater

Ballance held water discharge permit **3967-1** to discharge up to 28 cubic metres/day of treated domestic wastewater from an ammonia/urea plant via soakage trenches to groundwater in the Kapuni Catchment. This permit was issued by the Taranaki Regional Council on 23 September 1991 under Section 21 (c) of the Water and Soil Conservation Act, 1967 and is deemed to be an existing right under section 386 (1) (e) (ii) of the RMA. It expired on 1 June 2011.

From 6 December 2010 this discharge has been covered by Certificate of Compliance **7751-0**, as a permitted activity pursuant to Rule 22 of the Regional Freshwater Plan for Taranaki [2001].

1.3.4 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.

Ballance held two permits to discharge emissions to air during the 2010-2012 review period. Air discharge permit **4046-2** expired and was replaced with discharge permit **4046-3**.

Ballance holds discharge permit **4046-3** for the discharge of emissions into the air from the manufacture of ammonia and urea and associated activities. This permit was issued by the Taranaki Regional Council under Section 87 (e) of the RMA on 10 February 2012. It expires on 1 June 2011.

The replacement permit includes 13 special conditions.

Condition 1 requires the adoption of the best practicable option for controlling effects of discharges on the environment.

Condition 2 requires notification to Council prior to significant alterations to the plant.

Conditions 3 and 4 impose limits on ammonia emissions, while condition 5 requires monitoring of these discharges.

Conditions 6 to 8 impose limits on the emission of urea, carbon monoxide, nitrogen dioxide, and other contaminants.

Condition 9 requires odour generated at the site not to be objectionable beyond the plant boundary.

Condition 10 requires the provision of a report every three years addressing technological advances in ways to minimise emission, an evaluation and review of ammonia pressure safety valve systems, details of complaints received, and monitoring records required by condition 5.

Condition 11 requires the consent holder to convene meetings with Council and neighbours to discuss information relating to the consent.

Condition 12 requires the production of a site contingency plan in case of accidental discharge or spillage.

Condition 13 is a review provision.

The permits are attached to this report in Appendix I.

1.4 Monitoring programme: water

Section 35 of the RMA sets out an obligation upon 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 and report on these.

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 resource consent holders.

Monitoring at the AUP is carried out by both Ballance 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 from the exercise of the resource consents; and
- to provide information for management of the wastewater disposal system.

1.4.1 Monitoring by Ballance

Monitoring undertaken by Ballance covers four main areas as described below.

1.4.1.1 Compliance

Compliance with resource consent conditions on abstraction and discharge rates and on discharge and receiving water compositions is determined on a regular basis.

1.4.1.2 Irrigation system management

The irrigation system is managed through monitoring of inputs from effluent, and outputs through grass removal and drainage to groundwater. Soil and herbage analyses are performed.

1.4.1.3 Groundwater

A series of monitoring bores within and around the irrigation areas is used to monitor the effects of the irrigation system on groundwater quality. A total of 42 monitoring bores have been installed at the AUP since 1981. An electromagnetic induction survey has been conducted annually since 2002.

1.4.1.4 Biological monitoring

Since 1981, biological monitoring of the Kapuni Stream and its tributaries has been carried out regularly by a consultant for Ballance as part of a combined monitoring programme for the AUP and the Vector gas treatment plant on an adjacent site. The Kapuni Stream, in the vicinity of the AUP, is monitored approximately quarterly to detect any changes, over time, in the abundance or diversity of bottom dwelling organisms, and biannually for fish. This biological monitoring programme is jointly administered with the Vector gas treatment plant, which also discharges effluent into the Kapuni Stream. During the monitoring period, Stark Environmental was engaged to perform the quarterly sampling and to provide an interpretation of the resultant monitoring conducted. The results are forwarded to the Council for review.

1.4.2 Monitoring by Taranaki Regional Council

The water quality monitoring programme for the AUP site undertaken by the Council consists of four primary components as described below.

1.4.2.1 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 resource consent conditions and their interpretation and application, in discussion over monitoring requirements, preparation for any reviews, replacement or new resource consents, advice on the Council's environmental management strategies, the content of regional plans, and consultation on associated matters.

1.4.2.2 Review of Ballance's monitoring data

Monitoring data gathered by Ballance are reviewed monthly to determine compliance with resource consent conditions and to assess trends in water usage, discharge composition and groundwater quality.

1.4.2.3 Site inspections

An officer of the Council visits the AUP site quarterly. Inspections are made of chemical dosage and storage areas, the stormwater system, the effluent treatment system and the irrigation areas. Monitoring results, irrigation records and activities which may influence plant effluent quality are discussed. The site neighbourhood was surveyed for environmental effects.

1.4.2.4 Chemical sampling

The results of monitoring reported by Ballance were checked on two occasions within each year of the monitoring period by splitting samples of wastewater, stormwater and receiving waters (the Kapuni Stream) upstream and downstream of the discharge point and mixing zone concurrently for comparative laboratory analysis. The groundwater monitoring procedure was checked within each year of the monitoring period.

1.5 Monitoring programme: air

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 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 resource consent holders.

Monitoring of discharges to air at the AUP is carried out by both Ballance and the Council. The purposes of monitoring are:

- to determine compliance with conditions on resource consents;
- to determine the effects on the receiving environment from the exercise of the resource consents; and
- to provide information for management of the discharges to the atmosphere.

1.5.1 Monitoring by Ballance

The 'dust scrubber' stack was scheduled to be sampled isokinetically and analysed by a consultancy firm, K2 Environmental Ltd, on two occasions during the monitoring year. Additional sampling was undertaken to investigate elevated and fluctuating urea mass emission rate.

Static monitoring stations for measurement of atmospheric ammonia concentration were established at two locations on the site boundary in September 2012, in accordance with special condition 5 on consent 4046-3.

1.5.2 Monitoring by Taranaki Regional Council

The air quality monitoring programme for the AUP site consists of three primary components.

1.5.2.1 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 resource consent conditions and their interpretation and application, in discussion over monitoring requirements, preparation for any reviews, replacement or new resource consents, advice on the Council's environmental management strategies, the content of regional plans, and consultation on associated matters.

1.5.2.2 Site inspections

The AUP was visited quarterly for routine monitoring purposes. The main points of interest during routine monitoring were plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions, and emissions of greenhouse gases. Sources of data being collected by the resource consent holder were identified and accessed, so that performance in respect of operation, internal monitoring, and supervision could be reviewed by the Council. The neighbourhood was surveyed for environmental effects.

Inspections in relation to emissions to air were integrated with inspections undertaken for other purposes (e.g. effluent discharges).

1.5.2.3 Chemical sampling

The Council undertakes sampling of ambient air quality at the plant site on at least four occasions each year.
Particulate deposition is monitored using gauges placed at five selected sites in the plant vicinity for a single continuous period of approximately three weeks. The collected samples are analysed for ammonia, urea, conductivity, pH and airborne particulate concentrations.

Ambient gas levels are measured at or beyond downwind site boundaries on three occasions each year. Monitoring covers ammonia, carbon monoxide, volatile organic compounds (VOC), and combustible gases.
In addition, the data from emission testing by Ballance's consultant are audited by the Council.

1.5.2.4 Vegetation survey

A survey of vegetation in the vicinity of the AUP was undertaken by the Council in 2009-2010, as part of the assessment of environmental effects for replacement of air discharge permit 4046 which expired in June 2011. Foliage condition and nitrogen content of several indicator species at two sites within the potential zone of impact were compared against two nearby control sites.

2. Results

2.1 Water

2.1.1 Inspections

The Ballance Agri-Nutrients (Kapuni) Ltd site was inspected on four occasions during the monitoring year under review, on 21 August and 29 October 2012, and 31 January and 4 June 2013. On each occasion, site management was found to be good and the effluent management system, irrigation areas, and stormwater systems found to be working well. All bunded areas were found to be secure.

2.1.2 Water abstractions

Waingongoro Stream abstraction

Process and operation water for the site is pumped from the Waingongoro River, which is located 7.2 km east from the Ballance site. Water is pumped at a rate of approximately 140 m^3/h (3,360 m^3/d or 39 L/s). The consented daily volume limit, of 3,456 m^3 at a maximum rate of 100 L/s, was increased by 15% to 4,000 m^3, without an instantaneous limit, under replacement consent 0596-3 in August 2012.

Under the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010, Ballance was required by 10 November 2012 to take continuous measurements and keep daily records of volume taken, and thereafter supply by 31 July each year the record for the preceding 1 July to 30 June period. Suitable flow meters were already in place, and appropriate records kept, at the time the regulations came into force.

The daily abstraction record for 2012-2013 is presented in Figure 1.

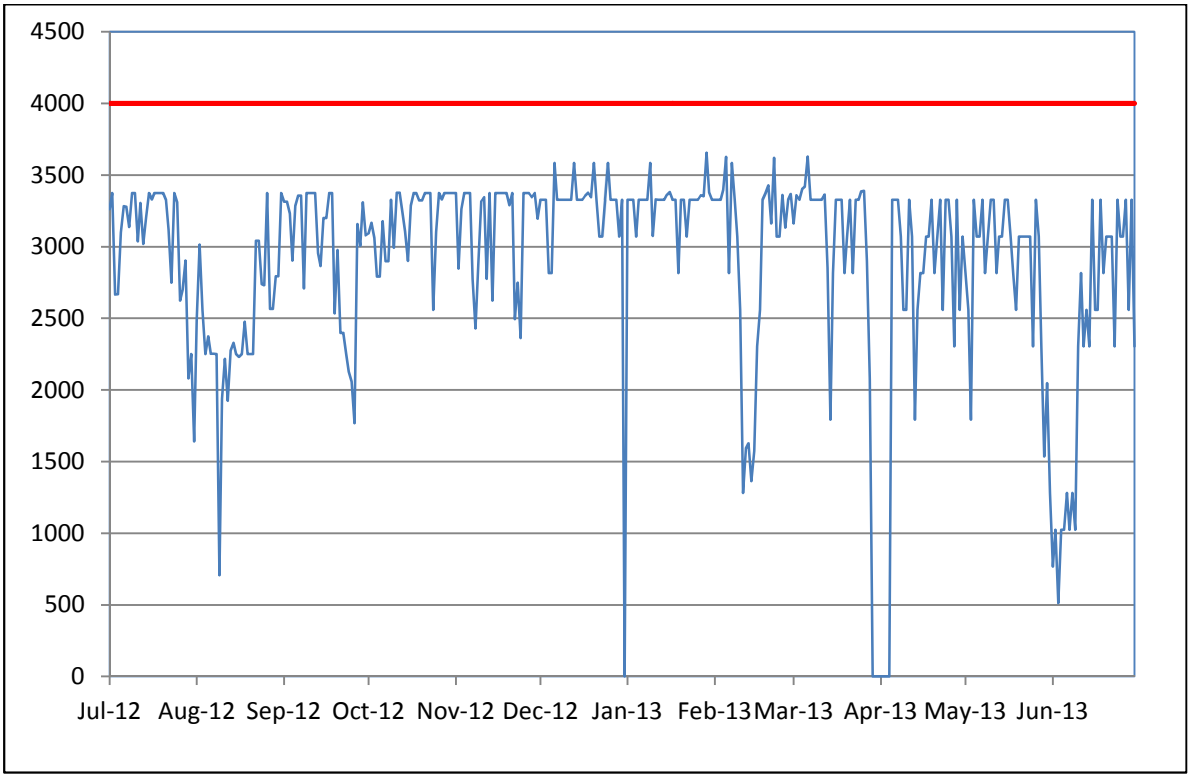

Figure 1 Daily water abstraction by Ballance Agri-Nutrients, July 2012 – June 2013, m^3

The record shows that the limit of 4,000 m^3/day on maximum abstraction volume was complied with throughout the monitoring period. There was zero abstraction on seven days, one in December 2012 and six in March/April 2013. The maximum recorded daily volume was 3,657 m^3, or 91% of the limit, on 29 January 2013.

The recorded total volume abstracted in the 2012-2013 reporting period was 1,056,324 m^3.

Verification of the accuracy of the system had yet to be done at the end of the reporting period, as suitably qualified independent persons had not been identified.

Kapuni Stream abstraction

The resource consent to abstract water from the Kapuni Stream was not exercised during the 2012-2013 monitoring period.

2.1.2.1 Intake options report and monitoring programme

Special conditions on consent **0596-3** require the Company to produce a report on options to minimise entrainment of juvenile fish through the water intake, and to develop a monitoring programme in consultation with Iwi:

9. *By 31 January 2013 the consent holder shall provide the Chief Executive, Taranaki Regional Council with a report, including recommendations, on an investigation of the costs and benefits of altering the intake to meet design guidelines for minimising the entrainment of juvenile fish.*
10. *The consent holder shall ensure that a monitoring programme is developed and undertaken that determines compliance with the conditions of this consent and identifies, as far as practicable, the environmental effects resulting from its exercise. The monitoring programme shall be reviewed annually.*
11. *In developing the monitoring programme referred to in condition 10 the consent holder shall carry out reasonable consultation with Ngati Ruanui and Ngaruahine that includes submitting the monitoring programme relating to the operation, monitoring and environmental effects of the consented activity.*

These new conditions were imposed to meet concerns raised by submitters to the consent application.

On 31 January 2013, Ballance provided a report by consultant Tonkin & Taylor which set out a two-stage process for assessing the costs and benefits of altering the intake to minimise entrainment of juvenile fish. The preparation of a monitoring programme to determine compliance with consent conditions also was addressed.

Stage 1 was a review of certain assumptions made in the desk-top study that had been undertaken in the Assessment of Environmental Effects for the consent application. This involved physical survey of the intake site, and review of fish database records against a predictive model for native fish presence. An engineer and an ecologist visited the site on 5/6 February 2013 to view and assess the existing intake structure, and local river morphology and habitat types. Known barriers to fish passage (weirs) on the river were also visited. Cross sections along a 400-metre length of river around the intake were surveyed on 11 February under extreme low flow conditions. A hydraulic model was then developed to estimate sweep velocities at the intake site to allow assessment of the potential for entrainment of fish under a range of river flows and different intake structure designs.

Stage 2 involved a conceptual design and cost/benefit analysis for alternative intake options to reduce fish entrainment risk. The information gathered in Stage 1, on physical intake site conditions and species of fish likely to be present, would be used in setting design criteria for the intake options.

The Stage 1 report, dated 15 May 2013, was received by Council on 6 June 2013. Essentially, the assumptions made in the initial desk-stop study were confirmed.

The Stage 2 study was underway at the end of the review period. Three intake/screen designs were considered, together with a do nothing (monitoring only) option.

The preparation of a new monitoring programme to determine compliance with conditions on consent **0596-3** was deferred until the outcome of stage 2 of the intake investigation was completed, as this would affect the design of any fish surveys. In the interim, the existing programme of measuring, recording and reporting of abstraction volumes continued.

2.1.3 Results of discharge monitoring

Stormwater and raw water treatment discharges

Resource consent **0598** allows for the discharge of up to 6,000 m^3 of uncontaminated stormwater and raw water treatment effluent to the Kapuni Stream and its tributary daily. Stormwater is discharged to the Kapuni Stream from a holding pond. At times of extreme high rainfall, the stormwater is also discharged to an unnamed tributary of the Kapuni Stream which runs through the plant site.

Normally these discharges are in batches with a frequency ranging from daily to weekly, dependent on rainfall. During and after exceptionally heavy rainfall, the discharge may occur for continuous periods of up to 24 hours.

In 2012-2013, the average daily volume of stormwater discharged from the site to the Kapuni Stream and its tributary was 550 m^3, whilst a total of 32,424 m^3 of stormwater was discharged on 59 days during the monitoring period. The volume of material discharged is in compliance with the resource consent.

A standard stormwater discharge procedure has been developed by Ballance for plant operators and has been approved by the Council. The procedure involves chemical analysis and visual inspection of the collected stormwater before each discharge. The flow of the Kapuni Stream is measured by a Flo-Dar radar/ultrasonic flow measurement device installed beside the Vector gas treatment plant, and is checked against readings from the Council's hydrometric station downstream at Normanby Road. The stream pH and temperature are measured to allow the estimation of unionised ammonia concentrations. A suitably trained staff member must authorise each discharge.

About one hour after commencement of each discharge of the basin contents, chemical analysis of the Kapuni Stream at Skeet Road, 600 metres below the discharge point, is carried out to monitor effects on water quality.

Monitoring of the discharge was undertaken by Ballance, and on two occasions within each monitoring year by the Council. The results of testing the samples taken by the Company and the Council are compared as a quality control measure. The results of the compliance monitoring and inter-laboratory comparison between the Council and Ballance are shown in Table 3 below.

The resource consent requires that the discharge shall maintain a pH range of 6.5 - 9.0. Monitoring by Ballance in 2012-2013 showed a range of 7.58 – 8.92, and that the resource consent limits were complied with throughout the monitoring period.

The resource consent also requires the zinc concentration in the discharge to be below 0.5 g/m^3. Ballance does not routinely test for zinc. Monitoring by the Council on 23 April and 2 July 2013 (delayed slightly) showed zinc levels of 0.130 and 0.042 g/m^3, respectively, therefore complying with the resource consent.

The resource consent places maximum limits on un-ionised ammonia (0.025 g/m^3) and sodium (40 g/m^3) concentrations in the receiving water.

Compliance with the limit on un-ionised ammonia concentration was achieved throughout the monitoring year, the maximum recorded concentration downstream at Skeet Road attributed to Ballance being 0.0159 g/m^3 on 9 November 2012.

The limit on sodium concentration of 40 g/m^3 was complied with within the monitoring year, the maximum recorded sodium concentration downstream at Skeet Road being 29.1 g/m^3 on 19 December 2012.

The monitoring results above demonstrate compliance with the conditions of resource consent **0598** in the Kapuni Stream and its tributary during the July 2012-June 2013 monitoring period.

The comparisons of laboratory results showed generally good agreement, and compliance with consent conditions. Where differences did occur, the concentrations reported were generally so low as not to be of concern.

Contingency discharges

When heavy or prolonged rainfall prevents irrigation of wastewater and results in the filling of the wastewater storage basins, treated wastewater is discharged to the Kapuni Stream via the stormwater outfall, as allowed for under resource consent **1766.** The Environmental Management System Operating Manual for the plant (which includes the Effluent Disposal Management Plan required under condition 7 of the consent) sets out a procedure for discharge in Production Effluent Contingency events. The Plan requires the Council to be notified before each discharge period.

This resource consent was not exercised during the 2012-2013 review period.

Domestic sewage

Domestic sewage generated at the AUP is treated in a submerged aerated filter (SAF) plant of 22.5 m^3/d capacity which features anaerobic/anoxic primary treatment and two-stage aeration secondary treatment. The treated waste is discharged to land via a soak-away system. There are also two septic tanks. The discharges complied with the conditions of Rule 22 of the Regional Freshwater Plan, under which this activity is permitted, throughout the 2012-2013 review period.

Table 3 Results of compliance monitoring and inter-laboratory comparison between Council and Ballance, 2012-2013

		Spray Irrigated Effluent IND002006								D-Min Waste and Stormwater IND002007				Kapuni u/s of AUP KPN000293				Kapuni d/s of AUP KPN000300			
		23 Apr 13				2 Jul 13				23 Apr 13		2 Jul 13		23 Apr 13		2 Jul 13		23 Apr 13		2 Jul 13	
		Grab		Composite		Grab		Composite		TRC	AUP	TRC	AUP	TRC	AUP	TRC	AUP	TRC	AUP	TRC	AUP
		TRC	AUP	TRC	AUP	TRC	AUP	TRC	AUP												
Time	NZST	1000	1000			1030	1033			1010	1010	1025	1025	1300	1300	1110	1108	1315	1315	1120	1108
Temperature	˚C	25.2				27.0				15.2				12.9	12.8	9.8	9.6	13.0	13.0	10.0	10.0
Conductivity, 20˚C	mS/m	186		184		16.3		157		44.2	39.4	210	214	5.9	6.5	9.7	10.4	6.3	6.7	13.2	13.5
pH	pH	7.2	7.17	8.0		7.1	7.21	7.9		9.0	8.79	8.9	8.74	7.6	7.64	7.8	7.73	7.7	7.66	7.8	7.80
Suspended solids	g/m³	50				-				70		-									
Turbidity	NTU													2.0				1.9			
Ammonia (free)	g/m³ NH_3													0.000	0.0003	0.000	0.0002	0.003	0.0023	0.002	0.0020
Ammonia (total)	g/m³ N	9.2	9.0	9.6	9.7		7.0	15.4	15.4	17.5	20.1	8.3	8.0	0.030	0.03	0.030	0.02	0.154	0.18	0.136	0.14
Nitrate	g/m³ N	18.2	18.5	17.1	17.2		23	18.9	22.0			9.2									
Nitrite	g/m³ N	19.6	20.2	14.8	14.9		10.0	7.1	6.86	1.53	1.51	0.67	0.68	0.002	<0.01	0.003	0.01	0.015	0.05	0.012	0.01
Nitrate and Nitrite	g/m³ N	38		32				26		5.1		9.8		0.31		1.16		0.34		1.32	
Urea	g/m³ N	3.4	2.15	1.19	2.69		1.11	2.5	4.44	10.9	8.3	4.9	5.0								
Nitrogen (total)	g/m³ N	59		53		39		47		35		24									
Potassium	g/m³		261	212	220		170	98	98.0												
Sodium	g/m³		173	178	187		171	173	174	49.4	49.7	451	388	5.9	5.66	8.8	7.99	6.7	6.25	15.1	14.3
Calcium	g/m³		45.7	51	51.8		58.4	62	63.4												
Magnesium	g/m³	17	16.2	20	18.7		17.6	19	17.3												
Chloride	g/m³			253		252		254													
Phosphorus, diss. reactive	g/m³P			2.4				2.2		0.004		0.004		0.014		0.012		0.016		0.016	
Copper (acid soluble)	g/m³	0.04				0.03				0.01		0.01									
Chromium (acid soluble)	g/m³	<0.03				<0.03				<0.03		<0.03									
Mercury (total)	g/m³	0.0011				0.0008				<0.0002		<0.0002									
Nickel (acid soluble)	g/m³	<0.02				<0.02				<0.02		<0.02									
Zinc (acid soluble)	g/m³	2.4				1.84				0.130	0.03	0.042	0.01								
Hydrocarbons	g/m³									<1.4		<0.5									

2.1.4 Results of receiving environment monitoring

Biomonitoring of the Kapuni Stream and its tributary is carried out by Ballance as required by the conditions of the resource consents. Ballance monitors the ecological effects of wastewater and stormwater discharges from their operations on natural waters in the vicinity of the plant. Since 1981, biological monitoring of the Kapuni Stream and its tributary has been carried out regularly by a consultant (Cawthron Institute until April 2007, Stark Environmental from August 2007) for Ballance as part of a combined monitoring programme for the AUP and the nearby gas treatment plant operated by Vector Limited.

The programme involves assessment of changes (if any) in the abundance and diversity of the macroinvertebrates and fish communities. Up to ten sites in the Kapuni catchment are monitored quarterly for benthic macroinvertebrates and biannually for fish by electric fishing. Monitoring results and their interpretation are forwarded to the Council quarterly.

Streambed macroinvertebrate communities were sampled on 9 August and 26 October 2012, and 22 January and 11 May 2013.

The survey reports were reviewed by the Council's freshwater biologist. The review report is attached as Appendix II.

The general conclusion was that the Kapuni Stream was in good health and the impact (if any) of the industrial activity at Kapuni is not discernible.

The Company's consultants also carried out two electric fishing surveys during the year. Their reports were also reviewed by Council Scientific Officers. The reports concluded that there is no indication that the petrochemical industries are having any significant adverse effect on fish communities in the Kapuni Catchment.

2.2 Land

2.2.1 Inspections

The Ballance Agri-Nutrients (Kapuni) Ltd site was inspected on four occasions in each monitoring year under review, on 21 August and 29 October 2012, and 31 January and 4 June 2013. On each occasion site management was found to be good and the effluent management system, irrigation areas, and stormwater systems found to be working well.

2.2.2 Results of discharge monitoring

Wastewater generated from the site, in the form of process effluent and contaminated stormwater, is disposed of, after treatment, by spray irrigation onto pastureland adjacent to the plant. The irrigation system comprises 12.8 ha operated as a "cut-and-carry" area, from which the grass is removed and supplied to a local farm. Until June 2004, an additional area of up to 26 ha was operated as a "grazed" area, on which the Company discharged effluent to a neighbouring farm (Buckthoughts). Irrigation on the original grazed area ceased in June 2004.

A new grazed area of 3.8 ha (Area 11) was established on another neighbouring farm (Luscombes) in December 2004. This was increased in stages to 15.2 ha by January 2008. Use of the original grazed area recommenced in February 2009, 18.7 ha (Area 7 and Area 8 adjacent to cut-and-carry area) being irrigated and a further 11.6 ha (Area 9 and Area 10 to west) available, but ceased again in February 2011. Effluent is applied by travelling irrigators.

Care is taken to ensure that effluent run-off does not occur and that pasture damage from water logging, vehicle traffic or pugging by livestock is minimised. At times of intense or prolonged rainfall, the effluent may be discharged to the Kapuni Stream, provided there is sufficient flow, to avoid irrigation of flooded areas (licensed by Resource Consent **1766**).

Due to the nature of activities at the Ballance site, wastewater generated from the site contains nitrogen, therefore, there is potential for nitrate contamination of groundwater beneath the irrigated areas as a result of discharging the wastewater. A formal plan for the management of the waste disposal system was compiled in 1990 from procedures developed during eight years of operational experience and from advice provided by the DSIR, Grasslands Division (now AgResearch, Grasslands Division). The success of the system relies on the minimization of nitrogen output and on good soil and pasture management of the irrigation areas.

The rate of nitrogen removal by pasture uptake and through microbial transformations is governed by many factors including the infiltration capacity of the soil, soil temperature, mineral content of the waste (particularly the cation balance), hydraulic loading (rainfall is the major factor), application method, grass removal method, and livestock management.

The total volume of effluent irrigated in the 2012-2013 monitoring period was 167,504m^3, which is an increase of 61,137 m^3, or 57%, from the previous year. The total mass of nitrogen disposed of in 2012-2013 (2011-2012) was 7,302 (4,571) kg, comprising 2,298 (1,672) kg ammonia, 4,198 (1,921) kg nitrate and 806 (984) kg urea, an increase of 2,731 kg, or 60%, from the previous year.

Special Condition 2 of Resource Consent **0597** limits the application rate of total nitrogen onto the irrigation areas as follows:

	Consent limit	Average Nitrogen application rate, kg/ha/y			
		2009-2010	2010-2011	2011-2012	2012-2013
Cut and carry area	1,000	610	495	294	396
Grazed pasture	300	113	177	53	146

Plant effluent is monitored for nitrogen species and cations (which affect soil stability). A certain amount of nitrogen is required for the health of pasture and the cut-and-carry area may not be receiving adequate nitrogen for optimal growth at certain times of the year.

Soil and herbage testing of the irrigation areas has been undertaken bi-annually (in spring and autumn) to determine the requirements for soil stability and grass health.

Applications of gypsum and Epsom salts (soil conditioners) are delivered routinely according to the results of the analyses. Other nutrients (superphosphate) are applied as required.

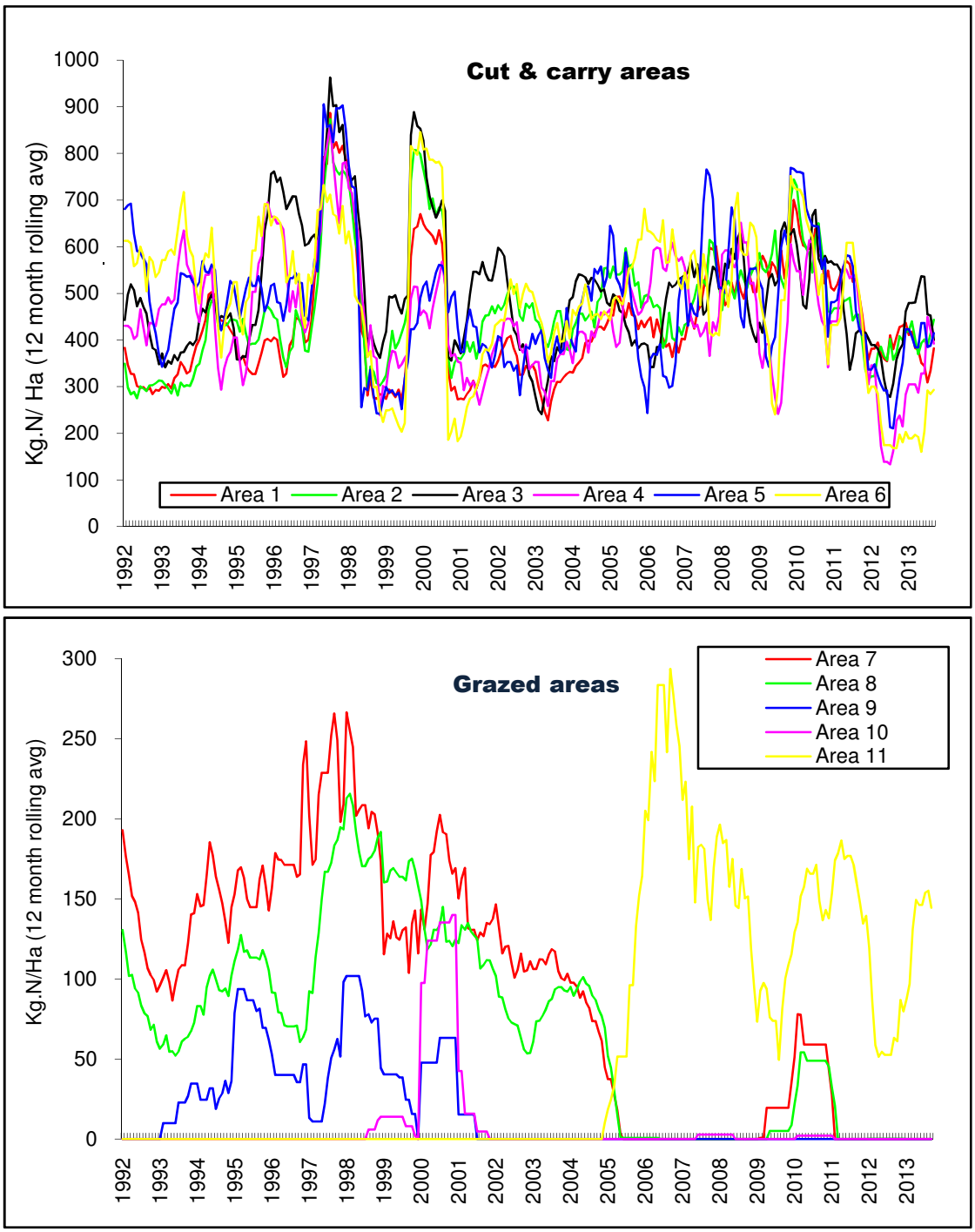

Figure 2 Nitrogen application rates on spray irrigation areas, January 1992 to June 2013

Cut and carry areas

Ballance complied with the maximum application rate of 1000kgN/ha/year specified in the resource consent for the cut-and-carry areas at all times during the 2012-2013 monitoring period. The average nitrogen loading across the cut-and-carry area was 396kgN/ha, an increase of 35% over the 2011-2012 monitoring period (294 kg /ha). This large increase was mostly due to a lower than normal application rate in the preceding period, during the repairs that followed the fire in August 2011 and a

plant turnaround from February 2012. The highest application rate was to Area 3, immediately east of the plant, where the application rate reached 537 kgN/ha/year in May 2013 (rolling year). The nitrogen application rates for each operational area are presented in Figure 2.

Grazed areas
Ballance complied with the maximum application rate of 300kgN/ha/year as specified in the resource consent conditions for the grazed areas at all times during the 2012-2013 monitoring period. The average application on the grazed areas, on Luscombes' south of the plant, amounted to 146 kgN/ha/year, an increase of 175% over the 2011-2012 monitoring period. The highest application rate reached was 149 kg/ha/year in May 2013 (rolling year).

Soil and herbage monitoring
Ballance employs New Zealand Agricultural Research Institute Limited (AgResearch, formerly DSIR Grasslands) to carry out monitoring of plants and soils of the irrigation areas. This was the 26th year that the monitoring was undertaken.

The primary objective of the programme is to provide a management plan for the effluent disposal areas. In the case of the cut-and-carry area this is aimed at maintaining conditions which maximise the uptake of nitrogen, potassium and sodium from the effluent while preventing accumulation of leachable nitrate in the soil.

This includes managing the balance of cations in the surface soil to prevent deflocculation of soil colloids and the consequent loss of its ability to infiltrate water (hydraulic conductivity).

The grazed area is managed with similar objectives. However, the total amount of nitrogen applied is limited by the capacity of the system to absorb and redistribute nitrogen rather than its removal.

A secondary objective is the monitoring of the effluent disposal areas to assess the performance and to allow modifications of the management plan.

The monitoring has two components:

1. Spring sampling which is centred on nutritional status of the areas and balance of cations in the surface soil; and
2. Autumn sampling which details the movement of nitrate through the soil profile to the saturated zone.

In July 2001, the Council agreed that assessment of the cation adsorption ratios during the autumn sampling round could be discontinued, as the ratios had been consistently within acceptable limits in recent years. This was based on AgResearch's opinion that the more detailed sampling undertaken each spring is a better indication of changes to cation ratios in the receiving environment. However, should subsequent sampling indicate any significant change in the cation adsorption ratios, then the autumn sampling should be re-established to ensure no adverse effects on the receiving environment.

AgResearch undertook sampling at the Ballance site on 16 October 2012 and 25/26 March 2013. The results of the AgResearch sampling undertaken in the 2012-2013 monitoring period are summarised below.

Spring soil and herbage survey

Surface soil and plant samples were taken in October 2012 from the cut-and-carry and Buckthoughts' (historically) and Luscombes' (currently) grazed areas, and soil only from a control area on the Luscombe farm.

The sward of the cut areas remained quite open, presumably from plant death resulting from shading. Both grazed areas appeared to be in a similar condition to last Spring but with fewer weeds in the Buckthought area than in recent years. Sodium and Potassium adsorption ratios (SAR and KAR, respectively) in the cut areas were found to be above recommended levels, and had mostly increased modestly. Herbage selenium and cobalt levels in the cut areas continued to show improvement and had now mostly reached the minimum recommended for animal health requirements.

Considerable overland run-off was observed near the southern boundary of the cut area, giving cause for concern, as run-off can lead to uneven water and nutrient application, and increased risk of anaerobic conditions and sward death.

Autumn deep leaching profiles

The March 2013 deep soil sampling report relates the mineral nitrogen status of the top four metres of the soil profile of the spray effluent areas. Additional cores were taken on the Luscombe property, where the irrigation area had been extended, and none taken on Buckthoughts', where irrigation had ceased. Annual nitrogen loadings and profile mass in both cut and grazed areas were similar to those lower values recorded the previous year (when the plant had been shut down for periods of ten and fourteen weeks, following a fire in August and a turnaround from February, respectively).

In the cut area, the average nitrate mass in the 3.0m profile, at 175 kgN/ha, was the second lowest since 2004. Biennial nitrogen loading, which is strongly correlated with leaching, was the lowest recorded. The surface run-off noted in the Spring survey was not evident.

In the grazed area, (3.0m) profile nitrate mass was similar to the previous year, averaging 298 kg/ha in the irrigated areas, compared to 168 kg/ha in the check plots. As usual, there was variation between and within the profiles as a result of the uneven distribution of nitrogen from livestock urine.

Again, more even spreading of effluent was recommended, and a lower proportion in winter when uptake by pasture is lowest.

2.2.3 Results of receiving environment monitoring

There are 42 groundwater monitoring bores established at the Ballance Kapuni site. The monitoring bores at the plant are monitored by Ballance for different purposes. The original sites were established to monitor the effects on groundwater of the application of effluent onto land (Resource Consent **0597**).

More recently, sites have been introduced for general site assessment and in response to specific problems. These include the monitoring of a contaminant plume resulting from leaks in the FECB (finished effluent catch basin) and from contamination detected around the urea process area. The functions of each of the monitoring bores are summarised in Table 4.

Table 4 Groundwater monitoring bore functions

Site	Monitoring bore
Control sites	22
Irrigation areas	3, 4, 5, 7, 10-1, 10-2, 10-3, 10-4, 10-5, W2, W1, W
Skeet Road	1, 2, 8, 12-1, 12-2, 12-3
FECB plume	East and West bores, 4, 13 to 21, 30
Plant site	23 to 29, 31 to 40

In June 2002, the groundwater monitoring programme was altered to include an electromagnetic induction (EMI) survey to be conducted annually which would help in identifying any contaminated groundwater and the extent of the contamination by measuring the electrical properties of the soil. The last EMI survey was conducted in October 2011.

The EMI surveys cover the large paddocks on the south and west side of the main production plant as well as the adjoining paddock on the neighbouring farm. Also included are roads inside the plant and the large paddock immediately south of the administration offices.

The October 2011 survey found that soil conductivity in the large paddocks to the south and west of the plant site (cut-and-carry) had increased generally compared to the previous survey results of February 2010.

There was also evidence of some enlargement of the two plumes that emanate southwards from the production plant area. However, there appeared to be no significant effect on the adjoining Luscombe farm paddock down gradient.

The paddock south of the administration offices showed a general overall increase in soil conductivity when compared to the 2010 results. There was evidence of a large plume running southward from where a pipeline crosses the irrigation area. This may be due to groundwater accumulating at one point in the soft backfill material around the pipeline and then leaching southward to produce the plume.

No new soil conductivity plumes were found, and there was no significant change from the previous survey results that would require further investigation.

2.2.3.1 Groundwater monitoring in relation to effluent irrigation

The ‘irrigation’ monitoring sites are sampled regularly, at frequencies ranging from monthly to annual, depending on groundwater composition. Groundwater levels were measured and the samples analysed for conductivity, pH, ammonia, nitrate, nitrite, urea, sodium and chloride.

Two of the monitoring bores (Bore 10/Bore W and Bore 12) are multi-piezometric (i.e. a cluster of standpipes screened to allow the collection of groundwater samples at various depths). These monitoring bores provide the most valuable information as they generate data on the depth of the effects of the irrigated effluent. Bore 10 was drilled at the downslope boundary of the cut-and-carry irrigation area in January 1987; Bore 12 was sunk 500 metres further downslope, at Skeet Road, in July 1989. The three shallower piezometers in Bore 10 were replaced with three piezometers (W, W1 and W2) set at slightly different depth intervals in November 2005, as the seals between some sampling intervals appeared to be failing.

Monitoring results for Bore 10 over the past 26 years have indicated that groundwater is affected by effluent irrigation at a depth of 6.0 to 7.0 m (Bore 10-2), but not at 11.0 to 13.0 m depth (Bore 10-4). Total nitrogen concentrations for Bore 10-2 and Bore W1 are presented in Figure 3, together with values for Bore 10-5 (18.0 to 19.5 m) for comparison.

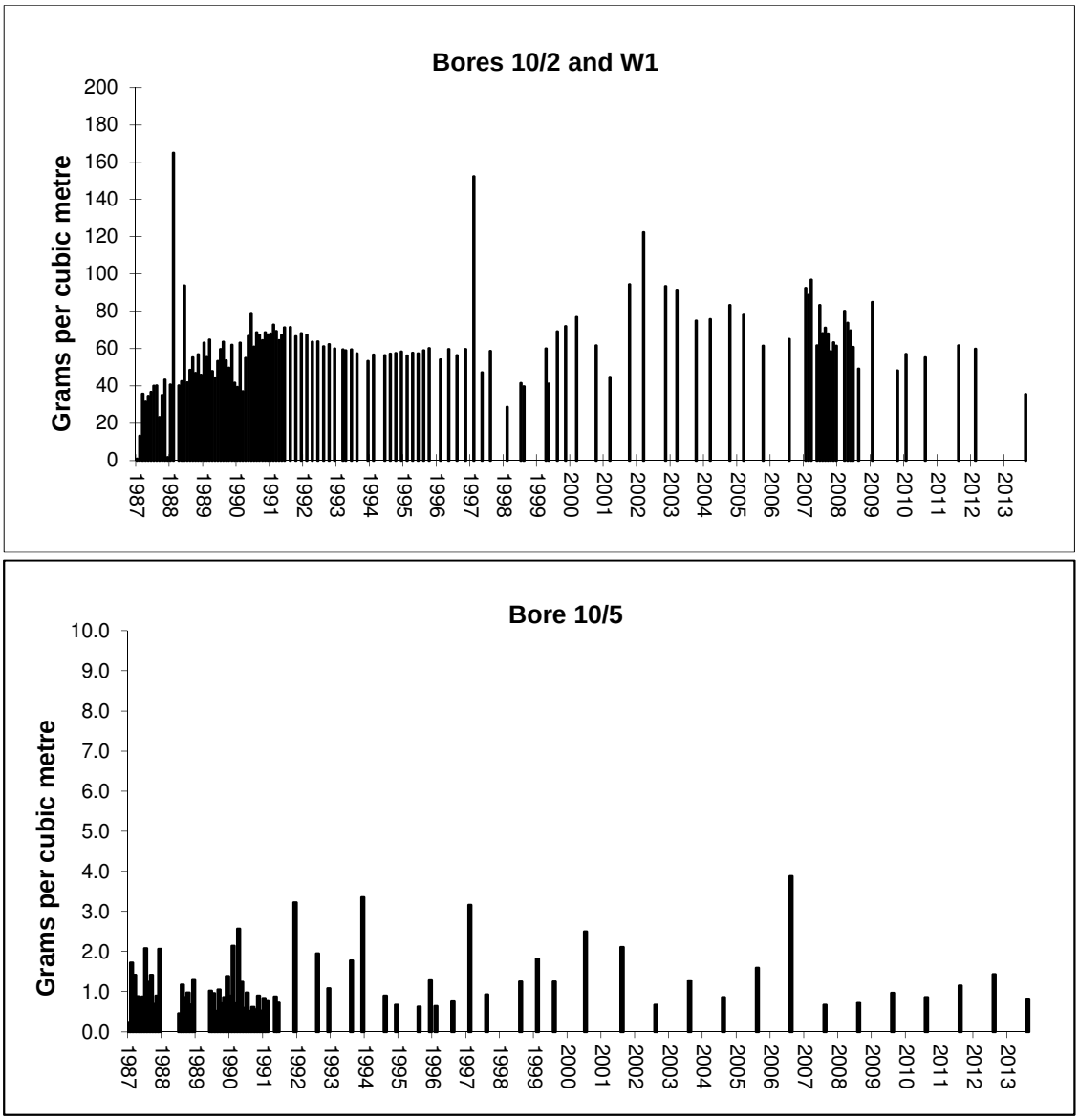

Figure 3 Total nitrogen concentrations in groundwater beneath spray irrigation areas (bores 10-2 and W1, and bore 10/5)

During the early and mid-1990s total nitrogen concentrations at Bore 10-2 fell slowly from about 70 to 60 g/m^3, (with an unexplained peak in February 1997), and have since gone through fluctuations over periods of about three years which have ranged from about 30 to 120 g/m^3. Monitoring ceased at bore 10-2 in October 2005 due to leaks, though sampling at bores 10-4 and 10-5 has continued. Bore W1, at a depth of 5.5 to 7.5 m is comparable with Bore 10-2. Results in 2012-2013 were slightly lower than for the previous year, from 35 to 56 g/m^3. Bore 10-5 is unaffected by the discharge of effluent to the land, with total nitrogen concentrations of about 1 g/m^3.

The peaks recorded for Bore 10-2 may be due to high nitrogen irrigation loadings. However, seasonal and several-year variations in nitrogen concentrations of similar scale (ie, +/- 100%) occur in wells which are not affected by effluent irrigation. This suggests these peaks are not irrigation related, but are due to variations in rainfall recharge, which affect the concentration of the nitrogen plume derived from the production area (discussed further below).

Until the source of these fluctuations can be confirmed, attention needs to be paid to the timing and magnitude of effluent nitrogen loadings to avoid additional losses to groundwater which may be unsustainable.

Bore 12 is situated beside Skeet Road and approximately 500 metres downslope of the cut-and-carry area. At Bore 12-1 (screened at 3 to 4.1 m below ground level) monitoring shows total nitrogen concentrations since early 1990s have fluctuated between 8.4 and 31 g/m^{3}N, with a general downward trend. Bores 1 and 8, east and west of Bore 12 on Skeet Road show a similar trend.

At Bore 12-2 (screened at 6 to 7.1 m below ground level) the nitrogen concentrations have generally fluctuated around 20 g/m^{3}N. Groundwater at Bore 12-3 (screened at 8 to 9.1 m below ground level) has typically shown low total nitrogen concentrations of less than 3.0 g/m^{3}N.

2.2.3.2 Groundwater monitoring in relation to the FECB plume

A leak from the finished effluent catch basin (FECB) occurred during the 1980s which subsequently was repaired. A second leak occurred during the 1990s. Following the second leakage Ballance stopped using the basin altogether. During the 1996-97 monitoring period the basin was relined with a double skin liner and a leak detection system was installed. However, during the basin re-commissioning, it leaked again and had to be repaired. A third layer was introduced to ensure the soundness of the system.

Groundwater is sampled at 14 monitoring bores established down slope of the FECB and on the spray irrigation area. These monitoring bores have been installed to determine the rate of movement and dispersion of ammonia that has leaked from the FECB over the past 29 years.

Monitoring by Ballance in the way of a geophysical survey conducted by GPR Geophysical Services indicates that ammonia from the historical leakage is moving slowly in a narrow plume towards a tributary of the Kapuni Stream. There will be some degradation of the ammonia to other nitrogen species occurring in the subsurface. Due to dilution from the effects of dispersion and natural attenuation of

the plume the total nitrogen concentrations reaching the tributary are expected to be low. There will be further dilution with the surface water in the tributary should the plume reach the tributary. Current monitoring shows the plume is yet to extend to this tributary (section 2.2.3.5).

Monitoring of the down gradient bores () shows the plume is presently relatively stable as a result of the removal of the source (i.e. repairing the FECB) and the continued abstraction and treatment of groundwater from three of the down gradient monitoring bores (East Bore, West Bore and Bore 30) under consent **4719**. The East and West Bores have been pumped since 1992 and Bore 30 since late 1994.

At West Bore, which is pumped at a location immediately downslope of the FECB, nitrogen levels were relatively stable after the last liner was installed, fluctuating between 44 and 172 g/m^3 since 1999, until winter 2013, when a spike to 444 g/m^3 was measured. Repeat sampling, in December 2013, showed a return to typical previous levels, at 131 g/m^3.

Bore 14 is situated near the centre of the plume about 50 metres downslope of the FECB. The results of monitoring show a reduction in total nitrogen concentration from 800 g/m^3 in 1994 to less than 150 g/m^3 since 2000, and 81 g/m^3 in August 2013.

Bore 30 is one of the down gradient pumping bores, downslope and west of Bore 14. Nitrogen levels there are affected potentially both by the ammonia plume and by irrigation of effluent. Overall, total nitrogen concentrations have decreased from 300 g/m^3 in 1995 to 52 g/m^3 in August 2013, with fluctuations that may reflect effluent irrigation or recharge variation.

The total nitrogen concentrations in Bore 4 and Bore 17, located further down gradient, whilst being elevated (34 and 52 g/m^3, respectively) have remained stable or, if anything, show a general decreasing trend. Pumping from East Bore, West Bore and Bore 30 should continue along with monitoring of the other bores.

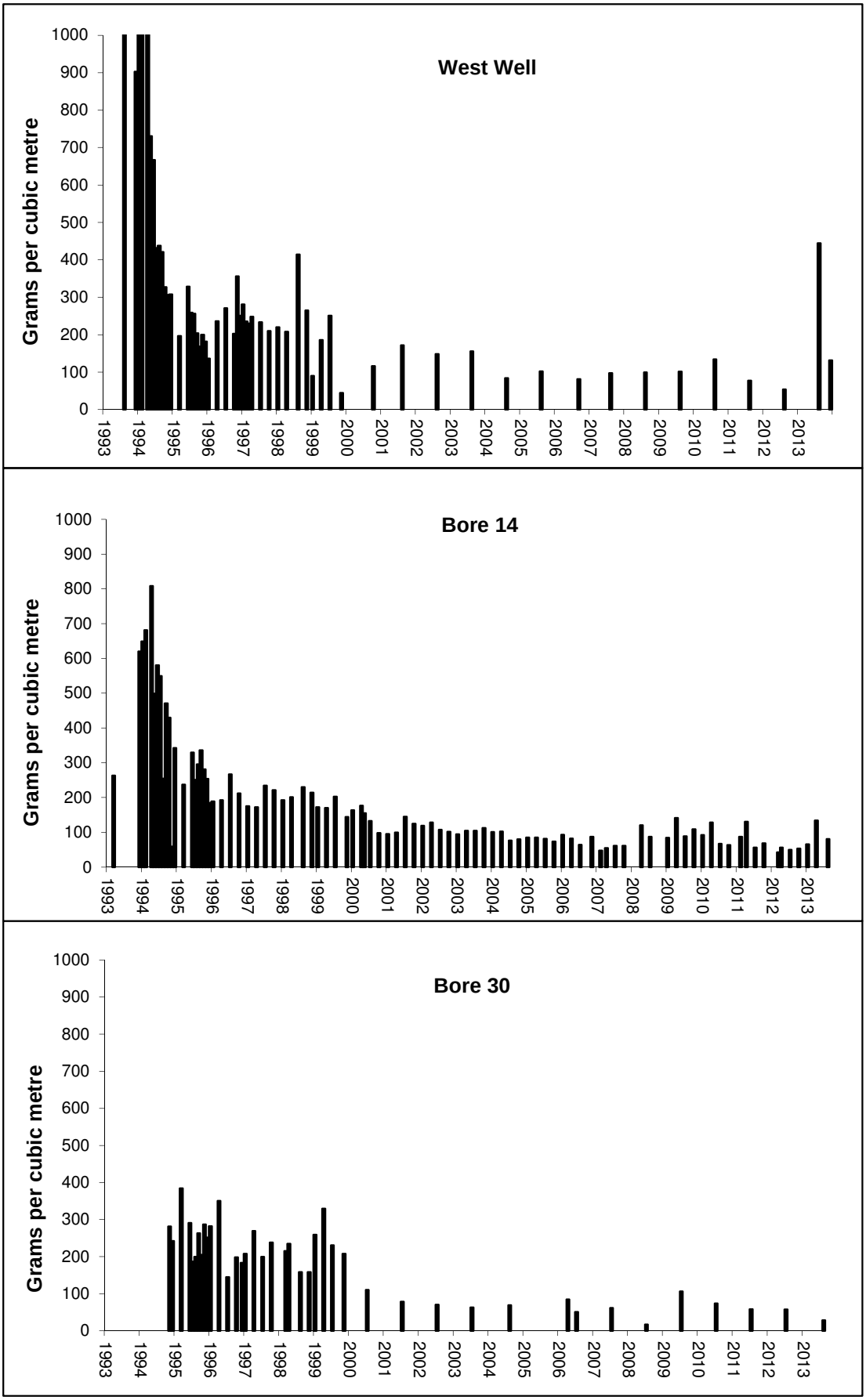

Figure 4 Total nitrogen concentration in groundwater associated with the FECB plume monitoring

2.2.3.3 Groundwater monitoring in relation to the granulator plume

During recent years Ballance has extended its groundwater monitoring programme to other areas of the plant. High total nitrogen concentrations (predominantly in the form of ammonia) had been detected in the vicinity of the granulator area of the plant (up to 11,500g/m^{3}N in Bore 32 recorded in 1998). In response to these elevated nitrogen concentrations Ballance has undertaken remedial pumping at Bore 25 and Bore 32 since late 1994 (Figure 5) under consent **4719.** This has resulted in a significant reduction in nitrogen concentrations measured in these monitoring bores. Pumping from, and monitoring of, these bores has continued through to the monitoring period under review.

Total nitrogen concentration in the pumped groundwater varies according to rate of pumping, increasing when abstraction ceases. Since 2000, total nitrogen concentration has ranged from about 300 to 11,000 g/m^3, mainly in the form of ammonia. In July 2005, the nitrogen in bore 25 increased sharply, possibly as a result of not pumping during a plant shut-down the previous month, and remained elevated for eight years. Another spike occurred in mid-2013, again possibly as a result of not pumping for a period. In 2008-2009, there was a 'spike' in total nitrogen at Bore 32, to 11,000 g/m^3, as the result of there being no pumping and treatment during a plant maintenance shutdown. Bore 38, closest to and down-gradient of the pumped bores, showed an increase in total nitrogen concentration early in 2006, for a period of about two years, which then reduced to 1000 to 2,500 g/m^3.

Further down-gradient, at Bores 39 and 40, total nitrogen concentrations have been much lower, at around 50 to 300 g/m^3, with a larger proportion recorded as nitrate. Continued annual monitoring is recommended to identify significant trends (if any) in this area.

The granulator plume is situated in the middle of the plant site and poses no short-term threat to freshwater ecosystems.

2.2.3.4 Groundwater monitoring in relation to the bulk urea storage and load-out area

Monitoring of groundwater in the vicinity of the bulk urea load out area (Bore 24) has been undertaken since late 1994. Since then, total nitrogen concentration has shown an increasing trend, rising from about 50 g/m^3 in 1994 to about 200 g/m^3 in 2000, and has since fluctuated between about 100 g/m^3 and 300 g/m^3 with occasional spikes of up to 680 g/m^3. Monitoring elsewhere down-gradient of the bulk storage area (Bore 23) shows no trend.

In order to reduce possible contamination sources, Ballance has made improvements to their 'house keeping' practices employed in the load out area.

The bulk load out facility is located near the up-gradient boundary of the plant and the presence of nitrogen contamination in this area poses no short-term threat to freshwater ecosystems.

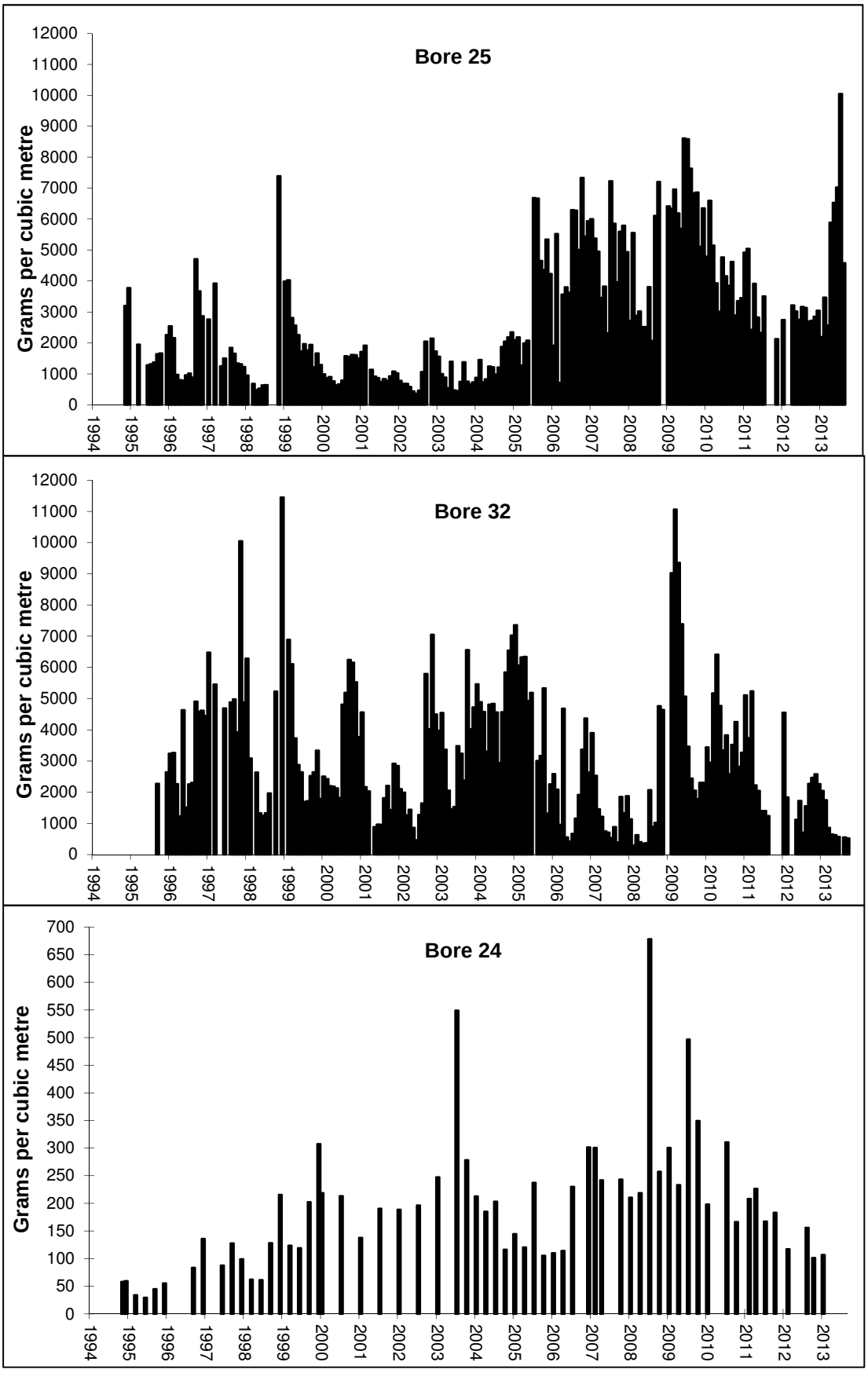

Figure 5 Total nitrogen concentration in groundwater in the vicinity of urea processing (bores 25 and 32) and the bulk storage (bore 24) areas

2.2.3.5 Tributary monitoring

The surface tributaries of the Kapuni Stream which pass alongside or under the plant and irrigation areas have also been monitored regularly for nitrogen. Results for East Gully have remained low, generally below 10 g/m^{3}N, whilst the water in West Gully is generally in the range 15-25 g/m^{3}N. The concentrations of total N recorded in Buckthoughts Gully have shown a marked decrease from the peaks of the mid-1980s (more than 35 g/m^{3}N). Since the mid-1990s total N has fluctuated in the range 12-26 g/m^{3}N.

2.3 Air

2.3.1 Inspections

The Ballance Agri-Nutrients (Kapuni) Ltd site was inspected on four occasions during the monitoring year under review, on 21 August and 29 October 2012, and 31 January and 4 June 2013. On each occasion site management was found to be good, and no odours were detected off-site at the time of inspections.

During each scheduled inspection the dust scrubber, the plant perimeter, the cooling towers, formaldehyde storage area, and the bulk storage area were checked for emissions to air including odour, ammonia and particulate deposition and dispersion. No effects on the receiving environment beyond the plant perimeter could be determined during any of the inspections from discharges to air or plant operation.

Ambient gas monitoring was also undertaken at the site on three occasions during the 2012-2013 monitoring period, on 24/27 October 2012, and 28/30 January and 25/26 February 2013, while deposition gauges were deployed at the site during the period from 24 October to 14 November 2012.

2.3.2 Results of discharge monitoring

2.3.2.1 Emissions testing

To assess compliance with special conditions on consent 4046, Ballance undertook monitoring of air emissions from the site. The discharge of air emissions from the dust scrubber was monitored on six occasions during the monitoring period by K2 Environmental Ltd. Normally, this testing is scheduled for twice each year. Additional testing was carried out in response to elevated results for urea mass discharge rate that were produced in July 2012, and to investigate elevated ammonia levels at the NW boundary in May 2013.

Emissions from the dust scrubber fan at the urea plant were sampled isokinetically and analysed by K2 Environmental Ltd. In previous monitoring periods, emissions from the main blow-down vent for the urea plant were also sampled. This ceased upon redirection of the continual purge to the main vent to the primary reformer for use as a fuel gas in February 2003. Routine sampling of the dust scrubber was undertaken on 10 July and 11 December 2012. Additional testing was undertaken on 20 July, and on 7, 8 and 21 May 2013. The results are presented in Table 5 below. The first test was the average of three samples (collected from up to 16 points across the vent), after which the number of samples was increased to five.

Table 5 Dust scrubber emission testing results

Date		10-Jul-12	20-Jul-12	11-Dec-12	7-May 2013	8-May-2013	21-May-2013	Consent limit
Ammonia	kg/h	170	220	160	180	140	120	295
Urea	kg/h	**28**	11	11	**21**	**14**	**21**	12
Urea	mg/m^3				90	62	88	125

Special Condition 3 on Resource Consent **4046** limits the ammonia emission from the dust scrubber fan and the blow down tank vent as a combined mass discharge of 295 kg/hour.

The concentration limit for urea emissions from the dust scrubber fan (or any other source) is 125 mg/m^3, and the mass discharge rate limit is 12 kg/hour, as set by Special Condition 6.

The level of ammonia discharged from the dust scrubber was recorded as being below the consent limit on all three monitoring occasions.

The urea mass discharge rate was recorded as being above the consent limit on 10 July 2012, by a factor of 133%, at 28 kg/hour. The test was repeated 10 days later, giving a result of 11 kg/hour, or 92% of the limit. A routine test, conducted on 11 December 2012, also showed compliance with the limit, at 11 kg/hour. An additional test was conducted on 7 May 2013, which produced another high result, at 21 kg/hour, or 75% over the limit. Additional tests, conducted one and 14 days later, also showed breach of the limit on urea mass discharge rate, by 17 and 75%.

Ballance advised Council on 7 May 2013 of a breach of urea mass discharge rate limit, and began an investigation into the reason, which lasted several months. Refer to section 2.5.

2.3.3 Results of receiving environment monitoring

2.3.3.1 Particulate deposition gauging

Particulate deposition gauges were deployed by the Council, between 24 October and 14 November 2012, at five locations around the Ballance site as shown in Figure 6. During retrieval on 14 November the deposition gauge and stand at Site AIR003405 were found lying on a ground. Therefore no results were obtained for this site.

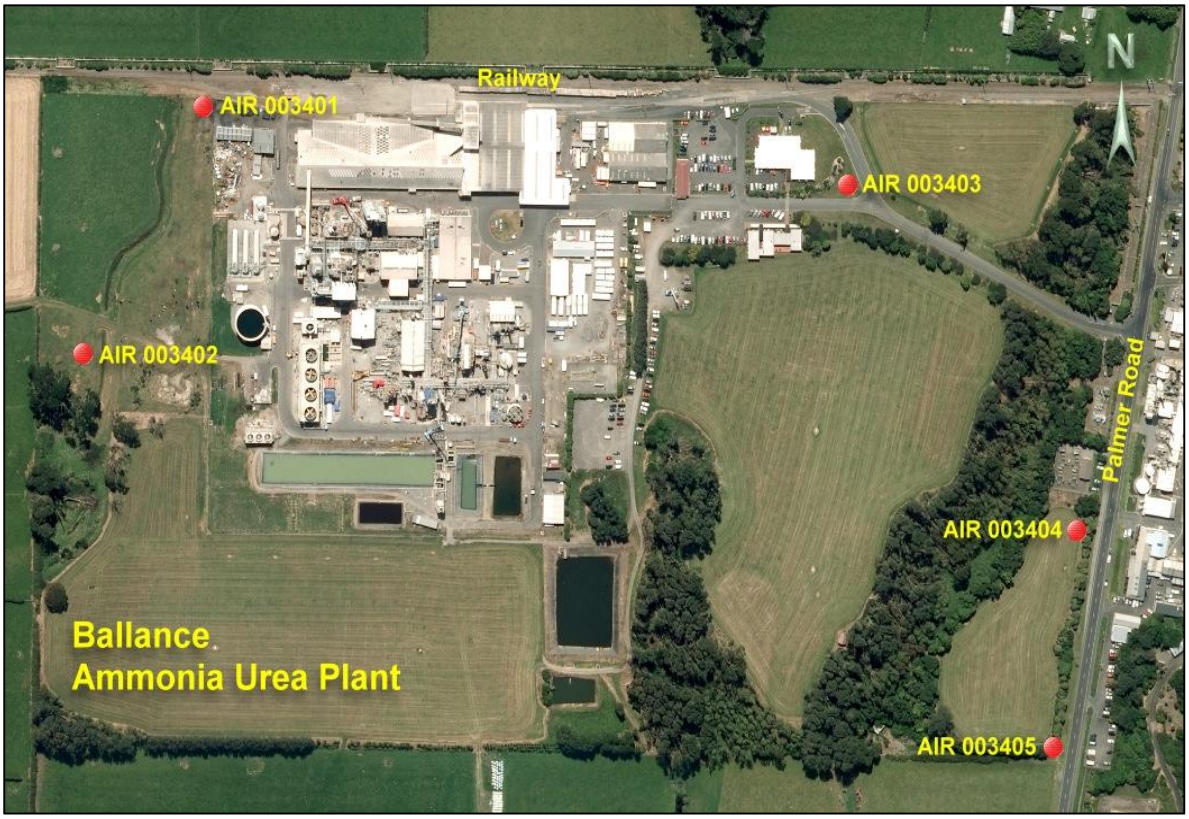

Figure 6 Location of deposition gauge sites 2010-2012

There was a low level of rainfall over the 21-day late spring 2012 monitoring period, with 40 mm falling at the Council's station on Lower Glenn Road, 10 km southwest of the plant. Winds (at Hawera AWS) blew from the N, NW and W for about 58% of the deployment (Figure 7). There was a significant component (21%) from SE.

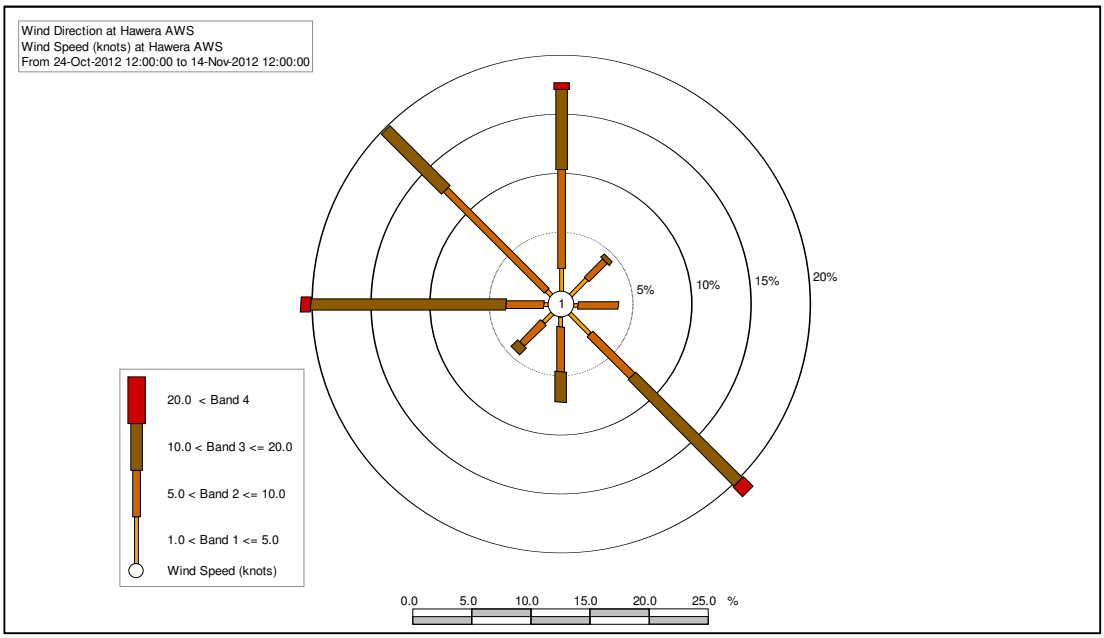

Figure 7 Wind-rose for Hawera weather station during deployment of deposition gauges, 24 October to 14 November 2012

The results are presented in Table 6, together with the data ranges from 1996-2012 for comparison.

Table 6 Results of particulate deposition monitoring for 24 October to 14 November 2012 with (1996-2012) data for comparison

Parameter	Site				
	AIR003401	**AIR003402**	**AIR003403**	**AIR003404**	**AIR003405**
	North west of the plant on the northern boundary	West of the plant (north of irrigation area)	On site north of roadway	On the eastern boundary	Close to the eastern boundary south of the plant
pH	N/R (5.6 – 7.7)	7.6 (4.7 – 8.4)	7.8 (6.9 – 7.8)	7.6 (5.5 – 7.7)	7.6 (5.8 – 7.9)
Conductivity mS/m/day	N/R (0.11 – 1.4)	0.36 (0.12 – 1.7)	0.18 (0.11 - 1.95)	0.14 (0.15 – 32.5)	0.18 (0.11 – 6.1)
Ammonia mgN/m^2/day	N/R (0.028 – 16.7)	1.7 (0.21 – 15.8)	2.1 (0.87 – 23)	1.9 (0.58 – 557)	2.4 (0.32 – 94)
Urea mgN/m^2/day	N/R (0.43 – 22)	1.0 (0.13 – 4.4)	2.0 (0.5 – 3.6)	0.55 (0.06 – 20)	0.48 (0.10 – 6.7)
Particulate mg/m^2/day	N/R (<10 – 90)	40 (10 – 80)	80 (10 – 110)	70 (10 – 460)	30 (10 – 80)

Material from the gauges was analysed both for solid particulates and for various chemicals associated with the discharge from the site.

The guideline value for nuisance levels for total particulate deposition used by the Council is 130 mg/m^2/day. Consideration is given to the location of the industry and the nuisance the community is likely to suffer, when assessing results against this value.

The results of the total particulate deposition measurements at and around the AUP site, during the monitoring period, are all within this guideline value. The maximum measured rate of 80 mg/m^2/day, at the site north of the entrance roadway, is consistent with the large proportion of W and NW winds during the survey.

The measured ammonia deposition rates at all five sites exceeded typical background rate of 0.4 mgN/m^2/day found in the Taranaki region. The recommended maximum rate for the agricultural application of nitrogenous fertiliser is 200 kg/ha/yr, or 55 mg/m^2/day. In the 2012-2013 monitoring period, the measured rates at the four sites ranged from 1.7 to 2.4 mgN/m^2/day and were within the recommended rate.

The 2012-2013 urea results were similar to those of deposition surveys done in previous monitoring periods. The results are all below the recommended maximum rate for the agricultural application of nitrogenous of 55 mg/m^2/day (or 200 kg/ha/year).

The results of ongoing deposition monitoring show that to date only minor amounts of deposition have been recorded in close proximity to the main processing facility, with little or no adverse effects on the surrounding environment. The main issue is that of potential effects from the irrigation system upon groundwater, which is being monitored as described in section 2.2.3.1.

2.3.3.2 Ambient gas monitoring by Regional Council

During the monitoring period, a multiple gas detector was deployed on three occasions in the vicinity of the plant. Each survey lasted approximately 48 hours, with the instrument placed in a down-wind position at the start of each deployment. Monitoring consisted of continual measurements of gas concentrations for the gases of interest (ammonia, carbon monoxide, and combustible gases). The location of the multi-gas meter for each sampling run is shown in Figure 8.

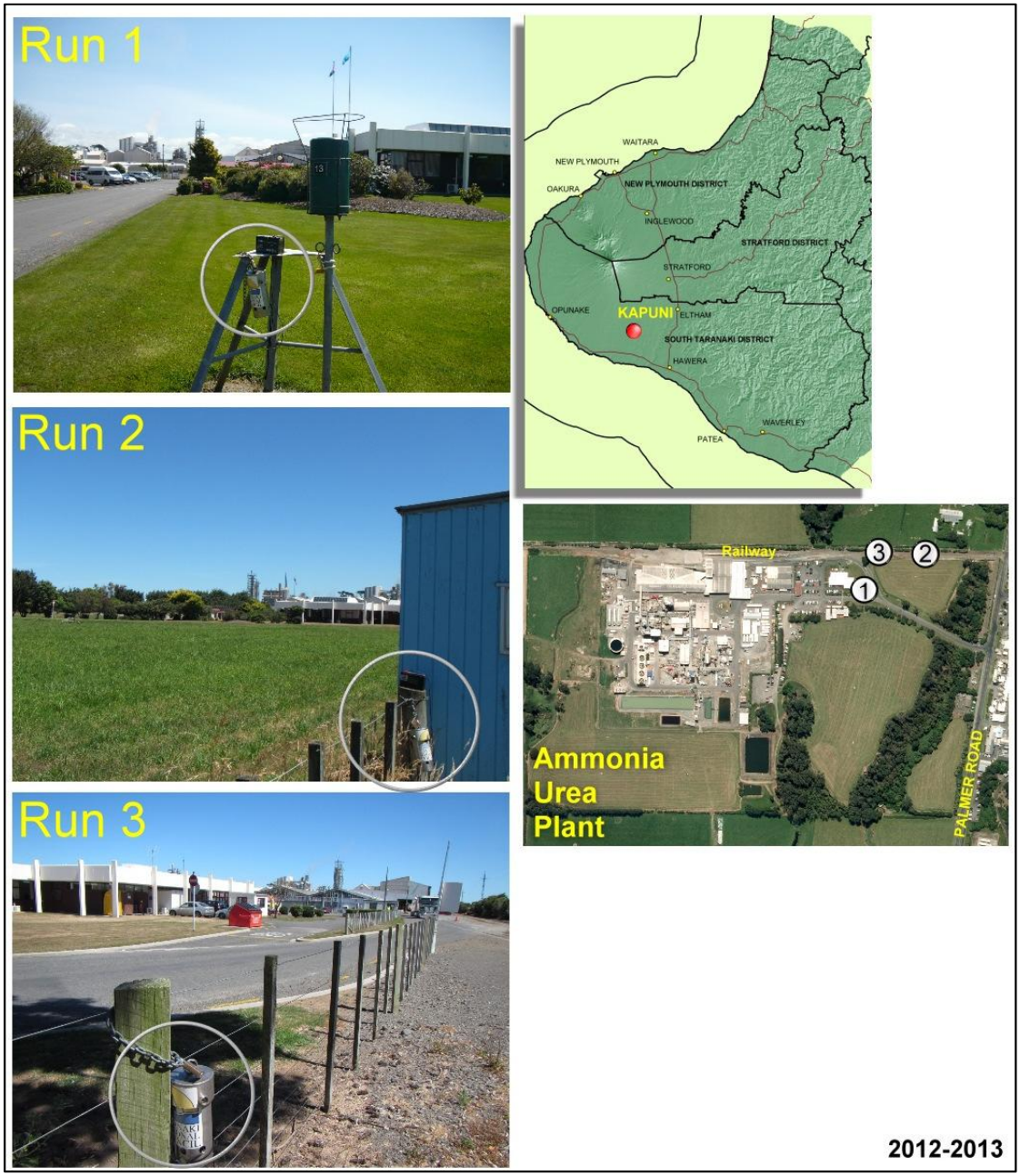

Figure 8 Sampling sites for ambient gas monitoring at ammonia urea plant (2012-2013)

Because of the nature of the activities on the site, it was considered that the primary information of interest in respect of gases potentially emitted from the site was the average downwind concentration, rather than any instantaneous peak value. That is, the long-term exposure levels, rather than short-term maxima, are of most interest. The gas meter was therefore set up to create a data-set based on recording the average concentration measured during each minute as raw data.

The meter is equipped with detectors intended to respond to ammonia, carbon monoxide, and the presence of combustible gases, recorded as the equivalent percentage of the lower explosive limit (LEL) of methane.

Because the lower explosive limit of methane in air is about 5%, then a reading of 1% LEL is equivalent to an actual concentration of 1% of 5% that is, an actual concentration of 0.05%.

The meter is used for screening purposes, to determine whether further investigations are warranted. It is known that gases other than the nominated target gas can interfere with results. In particular, the Council has found during use that the Multi-Rae meter will sometimes register the presence of ammonia when none is present, and also that ammonia, carbon monoxide, and volatile organic gases will give spurious LEL results. The carbon monoxide detector will react to some volatile organic gases. The exact numbers shown in the attached graphs and tables should therefore be interpreted with caution.

2012-2013 monitoring results

The results of monitoring undertaken for in the 2012-2013 year are summarised in Table 7. The data for ammonia and carbon monoxide from each run are presented graphically in Figure 9 and Figure 10. (No combustible gas was detected).

Table 7 Summary of ambient gas monitoring results - Ballance Agri-Nutrients 2012-2013

Run		1	2*	3	Average
Period (from/to)		24-Oct-12 13:27 27-Oct-12 20:25	28-Jan-13 13:35 30-Jan-13 14:45	25-Feb-13 13:21 26-Feb-13 11:44	
Max	NH_3 (ppm)	2.10	1.00	0.20	**1.10**
	CO (ppm)	4.00	15.6	13.4	**11.0**
	LEL (%)	0.00	0.00	0.00	**0.00**
Mean	NH_3	0.20	0.10	0.10	**0.13**
	CO (ppm)	0.10	0.40	0.10	**0.20**
	LEL (%)	0.00	0.00	0.00	**0.00**
Min	NH_3	0.00	0.00	0.00	**0.00**
	CO (ppm)	0.00	0.00	0.00	**0.00**
	LEL (%)	0.00	0.00	0.00	**0.00**

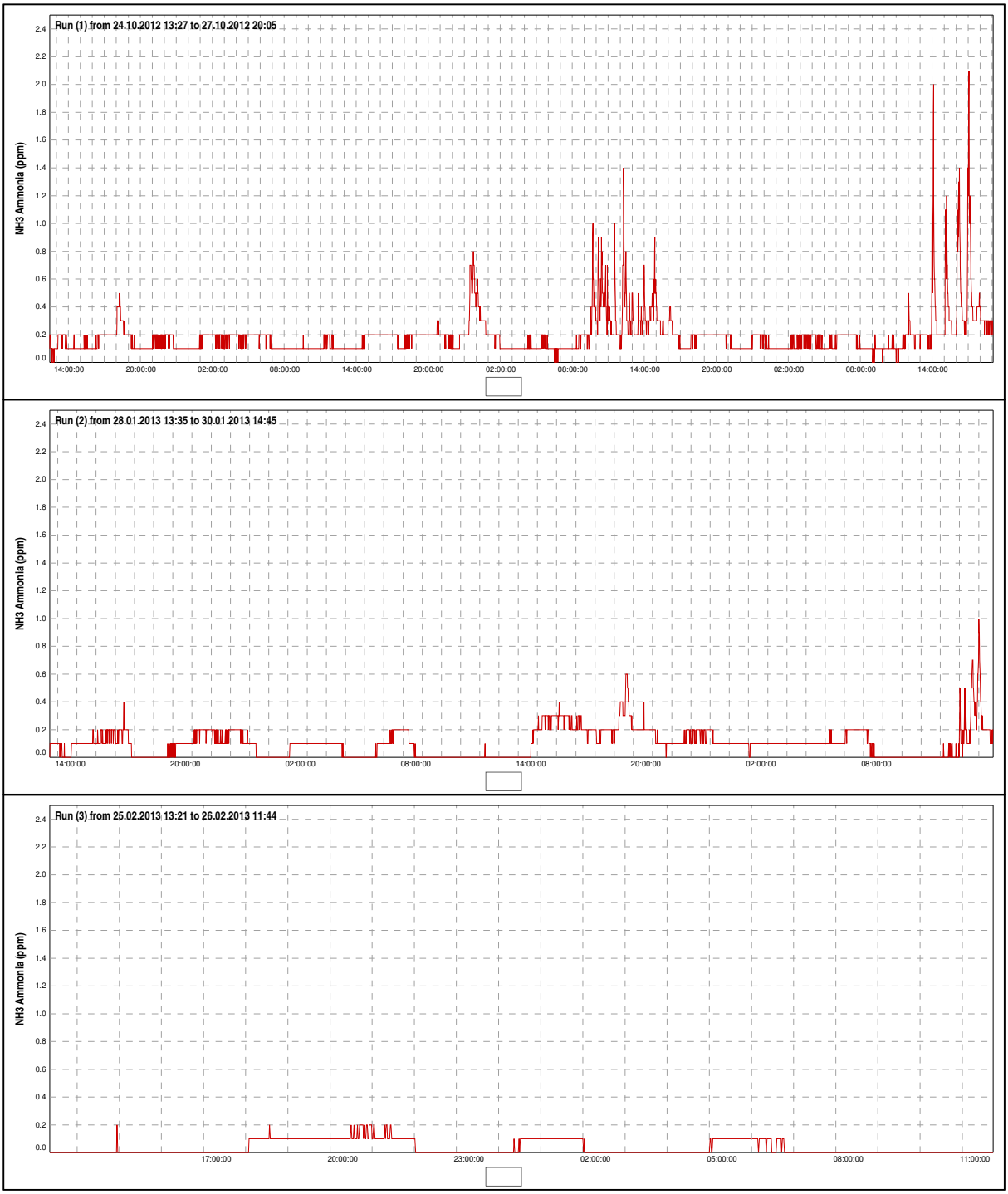

Figure 9 Graphs of ambient ammonia gas levels in the vicinity of ammonia urea plant, 2012-13

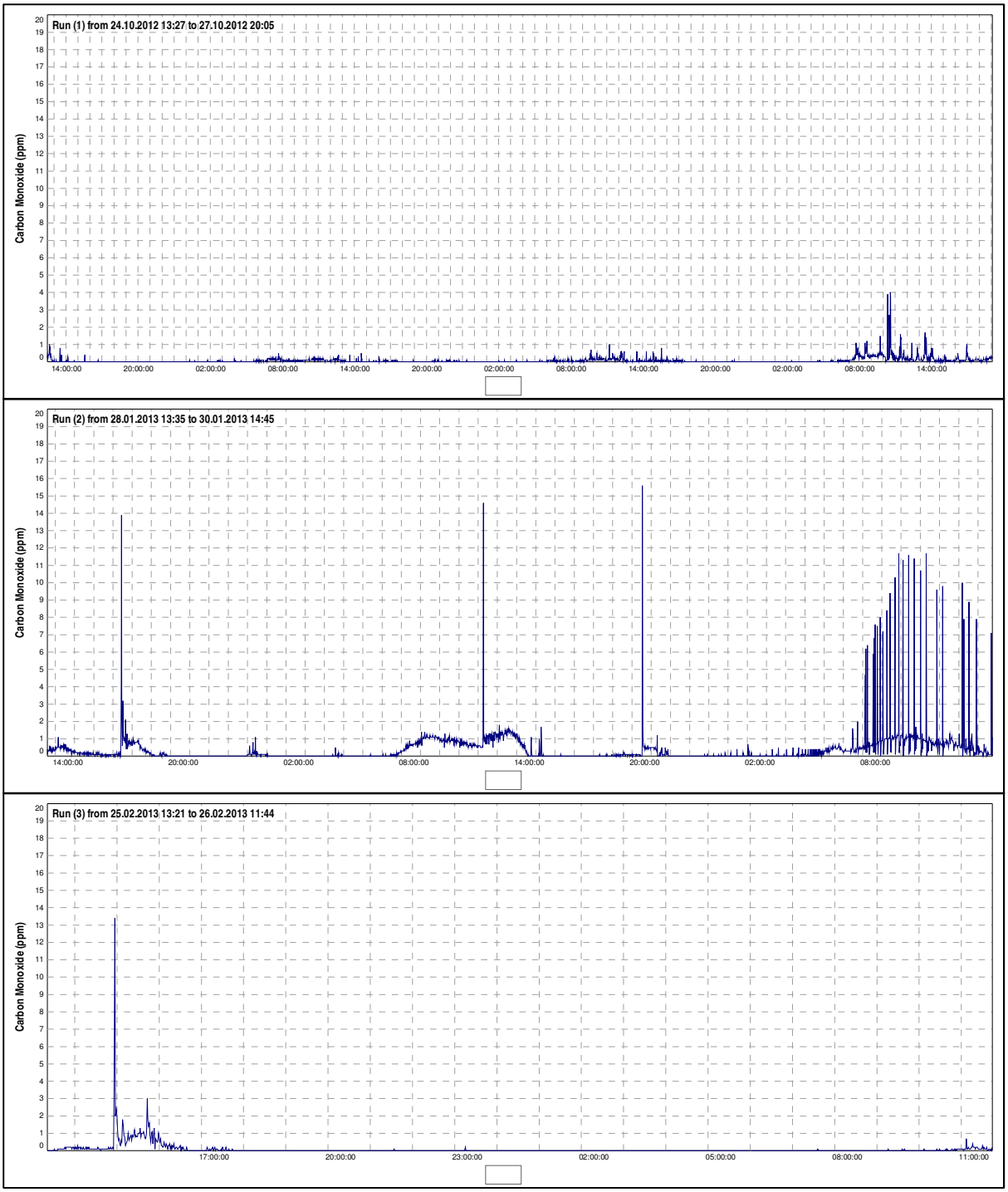

Figure 10 Graphs of ambient carbon monoxide levels in the vicinity of the ammonia urea plant

The consent covering air discharges from the Ammonia Urea Plant has specific limits related to particular gases. Special condition 4 of consent 4046-3 sets a limit on the ammonia concentration beyond the boundary of the site.

"The emission of ammonia to the atmosphere under normal operation, start-up and shut-down shall be so controlled to ensure that the maximum ground level concentrations [one-hour average] do not exceed 4.27ppm (v/v) beyond the boundary of the site."

The maximum concentration of ammonia found during the three monitoring runs was 2.1 ppm, which wholly complies with the consent condition.

Special condition 7 of consent 4046-3 sets a limit on the carbon monoxide concentration at or beyond the site boundary.

"The consent holder shall control all emissions of carbon monoxide and nitrogen dioxide to air so that the maximum ground level concentration of any of these contaminants, arising from the exercise of this consent, measured under ambient conditions does not exceed the relevant ambient air quality standard as set out in the Resource Management [National Environmental Standards for Air Quality Regulations, 2004] at or beyond the site boundary."

The National Environmental Standard (NES) for carbon monoxide is 10 mg/m^3 expressed as a running 8-hour mean. The measured carbon monoxide concentrations were well within this limit, with the mean result found for the entire three runs at 0.2 ppm or 0.17mg/m^3.

The consent limit on carbon monoxide at or beyond the site boundary is 30 mg/m^3 (equivalent to 35 ppm) for one hour exposure, and 10 mg/m^3 for an eight hour average exposure. The measured carbon monoxide concentrations were well within both these limits.

The results show that there is generally little of concern in terms of the ambient atmosphere around the ammonia-urea plant. There are occasional ammonia peaks, but these tend to be short-term events only and would represent odour episodes only, in terms of their scale of significance. Carbon monoxide results were low on average, with a few brief spikes during all three runs, with maximum concentration of 15.6 ppm or 13.3 mg/m^3, and were mainly close to background levels.

2.3.3.3 Ambient ammonia monitoring by Ballance

Condition 4 on consent 4046-3 stipulates that:

The emission of ammonia to the atmosphere under normal operation start-up and shut-down shall be so controlled to ensure that the maximum ground level concentrations [one-hour average] do not exceed 4.27 ppm (v/v) beyond the boundary of the site.

Condition 5 on consent 4046-3, granted in February 2012, requires that:

Within 12 months of the issue of this consent, the consent holder shall to the satisfaction of the Chief Executive, Taranaki Regional Council, establish two static monitoring locations beyond the boundary of the site for the purpose of monitoring atmospheric ammonia on adjacent property and to check compliance with condition 4. The consent holder shall record the ground level concentration of ammonia at the static monitoring locations, every Wednesday morning between 7.00am and 10.00am, or at an alternative time as agreed to by the Chief Executive, Taranaki Regional Council.

In September 2012, two static monitoring stations for measurement of atmospheric ammonia concentration were established on the western and southern boundaries of the cut-and-carry irrigation area, in consultation with the owners of the adjacent properties, who had requested such monitoring at pre-hearing meetings on the

consent application, to determine any long-term trends. The start of the weekly three-hour sampling window was changed from 7.00 am to 1.00 pm, with the approval of Council, to fit better with the Ballance laboratory workload. Ammonia concentration was measured using a Draegar CMS instrument. Usually, one measurement is taken, over a period of about 10 minutes. The results of ambient ammonia monitoring for the period 19 September 2012 to 26 June 2013 are presented in Figure 11.

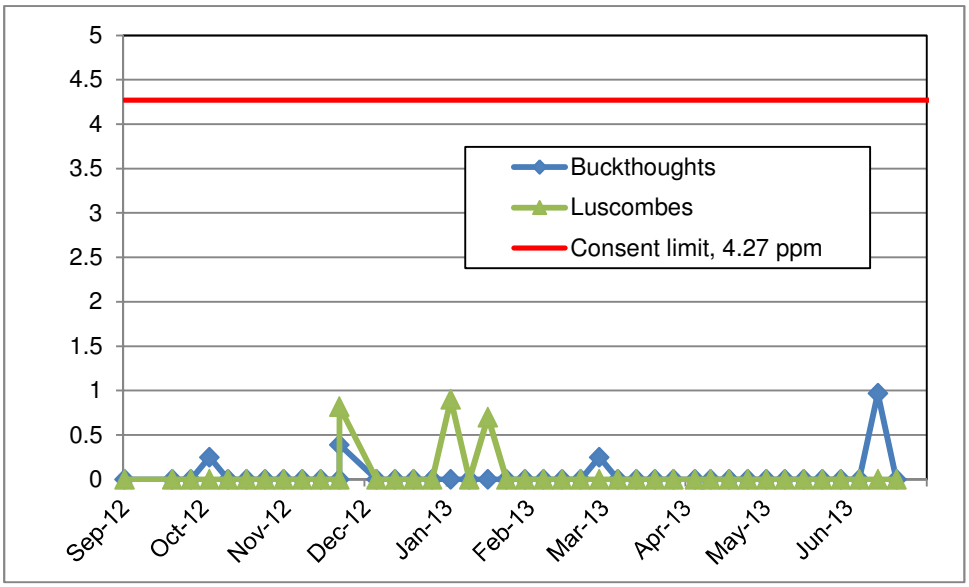

Figure 11 Atmospheric ammonia concentration at ground level on site boundary, ppm (v/v)

The results indicate compliance with the limit on maximum concentration of ammonia at ground level beyond the boundary. No trend is apparent.

Ammonia concentration was recorded above the detection limit of 0.2 ppm on four occasions at the western boundary, and on three occasions at the southern boundary. The maximum recorded value was 0.97 ppm, at the western boundary on 19 June 2013. At this time, there was a strong wind blowing directly from the plant.

2.3.3.4 Other ambient monitoring

Carbon Dioxide Emissions

Special Condition 5 of Resource Consent **4046-2** for the discharge to air required that Ballance provide the Council with its annual gross carbon dioxide emission data. There is no requirement to monitor carbon dioxide emissions on the new consent **4046-3**, though records continue to be kept. Ballance's calculated gross carbon dioxide emissions for the 1 July to 30 June period in 2012-2013 were 170,650 tonnes. The corresponding amount in 2011-2012 was 102,209 tonnes. The lower emissions in 2011-2012 were the result of less production time during repairs after the fire in August 2011.

Nitrogen Oxide Emissions

During the period under review there has been no monitoring of nitrogen oxide emissions from the Ballance Kapuni site. This is due to the findings of previous monitoring which determined the maximum concentration of nitrogen oxides, and

that there is no real risk of adverse environmental effects from emissions to air of nitrogen dioxide from the ammonia urea plant.

2.3.3.5 Vegetation survey

In December 2009, the condition of vegetation in the vicinity of the AUP was assessed. Foliar condition measurements of four native species were used to assess tree and shrub health, and foliage samples were taken for nitrogen analysis. Baseline surveys were undertaken in December 1993 and December 1994.

Four sites were monitored, two impact and two control. The potential impact sites were located among mature landscape plantings around the main entrance to the plant, and in the stream margin along the Kapuni Stream off Palmer Road. The control sites were located away from the prevailing wind, 4 km to the west at Kapuni School, and 6 km to the north on the banks of the Kapuni Stream by Eltham Road.

The results of the survey are available from the Council. The results provide no evidence that emissions from the AUP were having negative effects on vegetation surrounding the plant.

2.3.4 Technical review reports

Special condition 10 on consent **4046-3**, which was issued on 12 February 2012, requires Ballance to provide to Council by 1 June 2012 and every three years thereafter a written report which includes:

a) a review of any technological advances in the reduction or mitigation of discharges to air from the site, and the costs and benefits of these advances; and
b) an evaluation and review of ammonia pressure safety valve [PSV] systems, operating parameters, and vent heights to ensure that the probability of PSV discharges have been reduced as far as practicable, and to determine whether flaring or other control rather than vent height is practicable as a means to reduce ground level concentration of ammonia; and
c) details of any complaints received [external to the operation of the plant] to include date, time operating conditions, weather conditions and measures taken in response; and
d) monitoring records required by condition 5.

(Special condition 5 on consent **4046-3** requires Ballance to establish two stations for monitoring ground level concentration of ammonia beyond the boundary of the site within 12 months of the issue of this consent. Two stations were established in September 2012, one to the west on the boundary with Buckthoughts, and one to the south on the boundary with Luscombes - refer section 2.3.3.3).

The first report required under consent **4046-3**, which covers the period February to May 2012, was received in June 2012. The report is attached as Appendix II. The summary states:

Dust scrubber ammonia and urea emission results have stayed roughly constant over the past three years. Work is ongoing to reduce urea emissions, which have trended upwards over the past three years.

Total carbon dioxide emissions per unit of product were similar to previous periods.

Ballance-Kapuni will continually look to improve and optimise the plant process and capacity.

Ballance-Kapuni is committed to demonstrate a good level of environmental performance and compliance in regard to its air discharge permit (resource consent).

Ballance-Kapuni values its opportunity to operate in the Taranaki region and will continue to explore other options to reduce the impact its activities have on the environment.

A number of measures taken to reduce ammonia air emissions are described.

A new ammonia analyser was installed in the main vent in March 2011, made possible by new, optical technology, at a cost of over $200,000. The analyser, of itself, does not prevent ammonia emissions, but provides much earlier warning, and enables improvements to operational procedures to reduce emissions and save costs.

Several improvements to minimise the amount of residual un-reacted ammonia entering the dust scrubber were either implemented during the early 2012 turnaround or planned for later in 2012, at a total cost approaching $2,000,000. Further projects to reduce ammonia emissions from the dust scrubber are mentioned.

Ongoing work evaluating and reviewing pressure safety valves is described. A cost-benefit study on alternatives to direct venting to atmosphere, such as flaring, is undertaken to be done.

Five external complaints received in the period February to May 2012 are detailed, none of which involved breach of consent.

Progress towards establishment of the external ammonia monitoring stations required under special condition 5 is reported.

2.4 Riparian management

Condition 13 on water permit **0596-3**, issued in August 2012 to take from Waingongoro River, states:

The consent holder shall make ten annual payments of $30,000 (GST exclusive) to the Taranaki Regional Council as a financial contribution for the purpose of providing riparian planting and management in the Waingongoro River catchment. The first payment shall be made within 60 days of the commencement of this consent, and subsequent payments shall be made by 1 September each year.

The first annual payment of $30,000 was made in September 2012.

Ballance had already, since 1999, been donating voluntarily to Taranaki Tree Trust $3,000 per year for the specific purpose of riparian planting and management both upstream and downstream of the intake location.

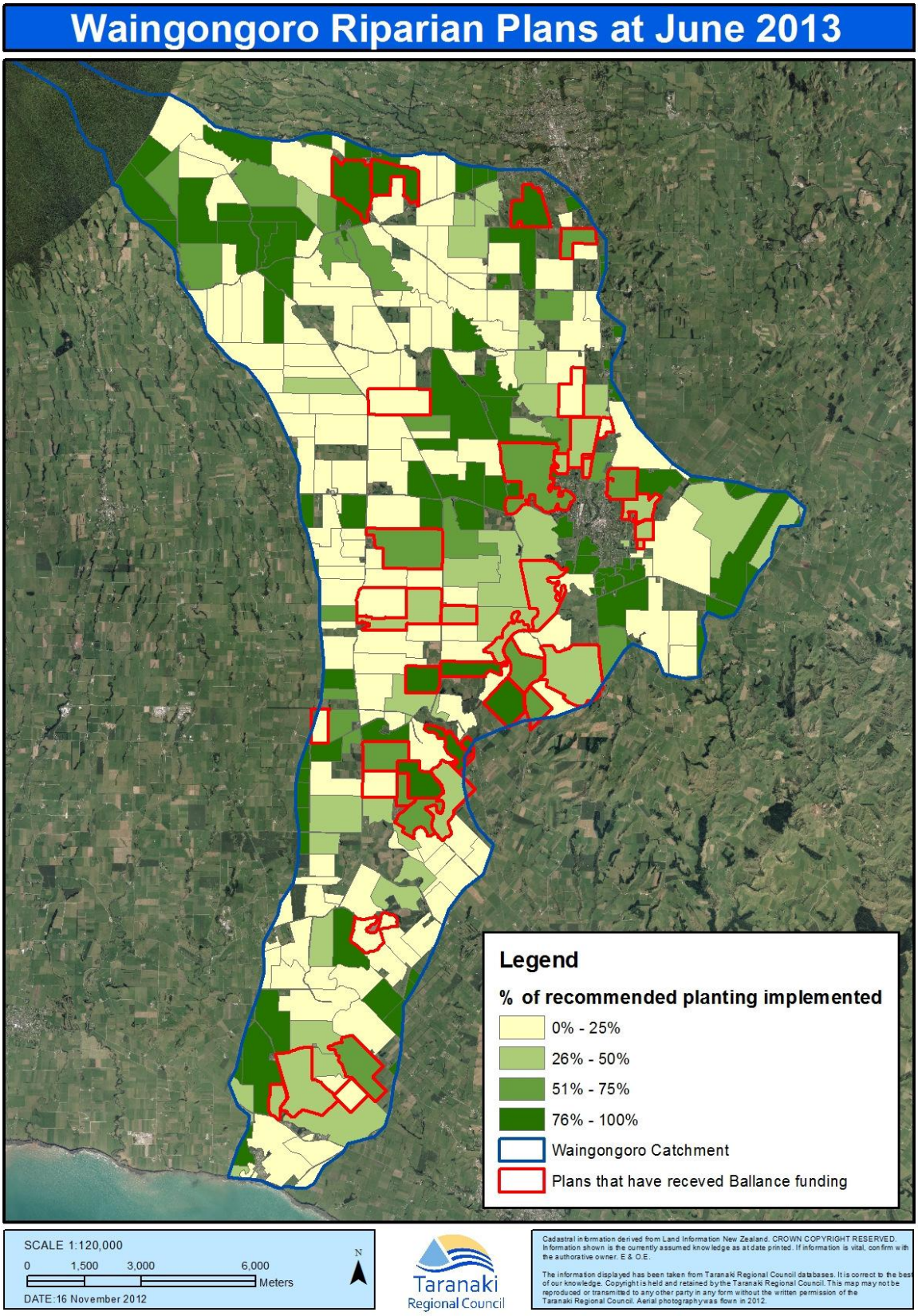

Figure 12 Riparian management plans in Waingongoro catchment with Ballance funding

At the end of the 2012-2013 review period, Council had prepared 263 Riparian Management Plans (RMPs) fully or partly located in Waingongoro catchment. Of the 263 plan holders, 30 had received funding from Ballance. The funding criteria for the Ballance riparian contribution was 50% of the cost of riparian plants and 50% of the cost of planting up to $1/plant to RMP holders in Waingongoro catchment.

The recommended riparian planting for the 30 RMPs that received Ballance funding covered a stream bank distance of 80km, of which 39 km, or 48%, had been completed at the end of June 2013. In comparison, of the recommended 328 km for the other RMPs, only 79 km, or 24%, of stream bank planting had been completed.

During 2012-2013, 23,123 plants were ordered through the Council's riparian plant scheme that were planted on the 30 RMP properties which received funding from Ballance.

The locations in Waingongoro catchment of the RMP properties which have received funding from Ballance are given in Figure 12. The proportion of recommended planting that has been implemented is indicated for each property.

2.5 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 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 2012-2013 period, it was necessary for the Council to undertake significant additional investigations and interventions, or record incidents, in association with Ballance's conditions in resource consents or provisions in Regional Plans in relation to the Company's activities at its Kapuni site on four occasions.

All of the incidents related to emissions to air and were notified to the Council by the Company. Two incidents involved discharges from the urea plant dust scrubber; the other two were breaches of the ammonia concentration limit at the site boundary. A written report was submitted by Ballance on its investigations into each incident.

Urea mass discharge from dust scrubber - Incidents 22809 and 23675

On 10 July 2012, a routine six-monthly test of the urea plant dust scrubber was carried out by K2 Environmental, an external testing agency. The measured urea mass discharge rate of 28.4 kg/h exceeded the limit of 12 kg/h on consent 4046-3 by a factor of 137%. Repeat testing on 20 July produced a value of 11 kg/h, within the consent limit, from an average of five measurements, though one result exceeded the limit.

The Company explained that the initial test had been undertaken while the plant was in abnormal condition, following instrumentation failure on the steam system, and that the urea emission rate was falling rapidly during the test period. In contrast, ammonia and urea concentration levels were both in compliance. In view of the short duration of breach, and lack of adverse environmental effect, no further action was taken by Council.

Another routine test, undertaken on 11 December 2012, also gave a urea mass rate from the dust scrubber of 11 kg/h, within the limit.

In May 2013, further testing of dust scrubber emissions was undertaken, as part of investigations into elevated ammonia concentrations at the site boundary nearest to the scrubber (within consent conditions), which showed breaches of the urea mass limit. The reason(s) for the breaches was unknown, as urea plant operation had been normal, though the distribution of urea emissions across the top of the scrubber was highly variable. Ammonia and urea concentrations were in compliance. In late May, an unexpected plant upset and shut-down provided opportunity to examine the dust scrubber. It was found that packing in the noise baffles within the upper section had become saturated with urea, contrary to design, possibly causing the variation in urea emissions and the apparent breach of consent. Rather than remove the packing, in an uncertain attempt to solve the urea problem, with likely breach of noise control conditions imposed by the District Council, an agreed Abatement Notice was issued by the Regional Council on 6 June 2013, requiring that works be undertaken to ensure compliance with the urea mass rate limit by the end of the upcoming (November) plant turnaround, by mid-December 2013.

(Subsequent investigation by Ballance identified issues with the sampling method which was causing large variability and inconsistent results. Based on these findings, Ballance extended the upper section of the scrubber stack to allow representative sampling to occur away from wetted surfaces and flow disturbances, such as internal baffles. The extension was put in place on 1 October 2013. Sampling on 23 October and 5 November 2013, generating eight separate measurements while the plant was operating at close to full capacity, gave an average urea value of 3.6 kg/h, or 30% of the limit, with a standard deviation of 1 kg/h.

Council cancelled the Abatement Notice on 5 December 2013, on the grounds that the tests which had recorded that the urea emissions were non-compliant were erroneous, being based on non-representative results obtained from samples contaminated during the sampling process. The related “breach” of consent 4046-3 was expunged from Council’s records).

Ammonia concentration at site boundary – Incidents 23406 and 23495

9 February 2013
On 9 February 2013, Ballance received an external notification from neighbour Vector Limited of an ammonia smell in the car park at the gas treatment plant (GTP) across Palmer Road. There was a westerly wind of 15 knots. The Council was informed immediately.

Ballance reported:

"Investigation of the notification revealed a breach occurring on the Eastern boundary. The initial boundary measurement was >5ppm (consent limit 4.27 ppm). A repeat test gave a value of 5.2 ppm. After immediate corrective actions were taken on the plant subsequent boundary testing gave measurements of <0.2 ppm.

At the time of the breach, the Urea plant was being shut down and its reactors vented and depressurised, ahead of a scheduled outage. Prior to the external notification, this process had progressed without incident and as per procedure. Following the external notification, and subsequent boundary testing, all venting and depressurisation activities were then resumed slowly, with testing confirming boundary ammonia levels at <0.2 ppm. Subsequent investigation of the incident identified the root cause of the release to be due to a blockage in one of the reactor drain lines. This had allowed reactor solution, containing high levels of ammonia, to enter a drain tank that had a vent to atmosphere.

Seven corrective actions were identified. These actions included communication of the incident learning across all shifts, modifications to operating procedures, changes to alarms, improvements to our maintenance activities and improving the effectiveness of the main vent analyser."

The Company's report was accepted by Council and no further action was taken.

18 March 2013
On 18 March 2013, Ballance received both an internal notification and an external notification from Vector about ammonia smell. There was a westerly wind of 15-30 knots.

Ballance reported:

Investigation of the notification revealed a breach occurring on the Eastern boundary, adjacent to the Vector plant. Continual monitoring over a one hour period gave a peak boundary measurement of 22.2 ppm and a one-hour average of 4.9 ppm (consent limit 4.27 ppm). Within 5 minutes of the first boundary measurement the TRC was informed of the event. A decision to shut down the Urea plant was taken 10 minutes later, to prevent further risk to the environment. Within 25 minutes of the plant shutting down the boundary ammonia level was less than 0.2 ppm.

At the time of the breach, the Urea plant had been operating normally and a swap over of our Recycle solution Uraca pumps was being undertaken. This is a routine activity. During this process, a safety valve associated with the pump being brought on-line lifted well below its set pressure (as confirmed by independent testing a IVE, New Plymouth), releasing solution rich in ammonia into our dust scrubber and vent system. The operators immediately swapped back

to the first pump, at which time its safety valve also lifted. To prevent any further emissions to atmosphere, the Urea plant was shutdown shortly thereafter.

The following day, a review meeting was conducted to identify immediate short tem actions, and medium term actions required to minimise the risk of a repeat incident. The meeting was attended by senior site management, Maintenance, Operations and Technical staff. These actions are included in the attached report…. "

A similar incident, involving early lifting of the new pressure safety valves occurred eight days later, on 26 March. This event, which was reported immediately to neighbours and Council, did not result in breach of consent (one-hour average 3.34 ppm v/v ammonia) because of modifications made to operating procedures since the first incident. A meeting between Ballance management and Council staff was held on 3 May to go over the incidents and the remedial actions that had been instituted.

Given that the breach of ammonia in air limit had occurred as the result of unforeseen mechanical failure of safety valves that had been installed for protection of plant and public, the contingency procedures the Company had put in place to avoid further breaches, and there being no serious adverse effect, Council took no further action.

3. Discussion

3.1 Discussion of plant performance

On-site maintenance and management at Ballance Agri-Nutrients Ltd was well operated. On-going liaison between Ballance staff and the Council has been indicative of the Company's commitment to development of environmental performance.

For water abstraction, no compliance issues arose with abstraction from the Waingongoro River. The consent to take from the Kapuni Stream in emergency was not exercised.

For discharges to the Kapuni Stream, the procedures of the environmental management plan were followed. Control, monitoring and reporting of discharges was good throughout the period. Results from interlaboratory comparisons generally correlated well. Biomonitoring indicated that discharges from the site were not having an adverse effect on the Kapuni Stream.

For discharges to land, the irrigation system for treatment and disposal of plant effluent was well managed. Effluent monitoring, surface and groundwater monitoring, and soil and herbage analysis were carried out in accordance with the environmental management system manual.

Groundwater monitoring indicated nitrogen levels associated with irrigation were similar to those in the previous monitoring period.

For emissions to air, in general, plant processes were operated and controlled so that the emissions authorised by consent were maintained at a practicable minimum. There were four minor incidents involving release of urea (2) and ammonia(2), all from the urea plant. One, and possibly both, urea incidents involved sampling issues that led to false high results. A modification was made to the upper section of the urea plant dust scrubber (in October 2013) to prevent further sampling errors. The overall project cost, including additional sampling costs, was estimated at $150,000. The ongoing review of the best practicable option to prevent adverse effects on the environment continued.

Overall the plant has been operating in an environmentally sound manner.

3.2 Environment effects of exercise of water consents

Spray irrigation of effluent to land, the contingency discharge of effluent and the discharge of stormwater and water treatment effluent to the Kapuni Stream are the activities that have greatest potential to adversely affect the aquatic receiving environment.

The results of biomonitoring in the Kapuni Stream indicate that there is no significant impact in the stream as a result of plant operations. In relation to discharges to land the high levels of nitrate in shallow groundwater are partly due to the heavy effluent application that occurred early in the life of the plant. Current

application rates are considerably lower. However, nitrate concentrations in the soil profile underneath the irrigation areas remain elevated.

Two concentrated ammonia plumes due to historical leaks from the effluent storage basin and from the urea plant are managed with pump and treatment systems. The contaminated groundwater is pumped back through the plant and waste treatment systems. Both plumes currently do not extend beyond the Ballance site and are monitored. They posed no short term threat to freshwater ecosystems.

3.3 Environmental effects of exercise of air discharge permit

During the monitoring period, the results of monitoring from site inspections, and the measurement of dust deposition and of ambient gas levels, indicated no significant adverse effect on the neighbourhood as a result of activities at the ammonia urea plant.

Over the reporting period, four air discharge incidents were reported to the Council by the Company that involved breach of consent, one of which was later disproved. Immediate action was taken by the Company in each case, followed by an investigation into the cause of these releases and preventative actions put in place.

The results from the gaugings indicate only minor amounts of deposition have been recorded close to the main plant, with no effect on the surrounding environment. Monitoring of gas concentration indicated that despite short-term ammonia peaks there is little of concern in the ambient atmosphere around the plant.

3.4 Evaluation of performance

A tabular summary of the Company's compliance record for the year under review is set out in Table 8 to 20 .

Table 8 Summary of performance for Consent **0596-2** Take from Waingongoro River

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Review Provision	Option not available before consent expiry 2011	N/A
2. Intake structure to be installed and maintained to minimise effects	Site inspections	Yes
3. Remedial works to be undertaken on stream or bank if required	Remedial works not required during year under review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**

N/A = not applicable

Table 9 Summary of performance for Consent **0596-3** Take from Waingongoro River

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	Yes
2. Installation and operation of monitoring equipment	Site inspection and receipt of abstraction records	Yes
3. Certification of monitoring equipment	Receipt of certificate. Installation details of existing meters/ dataloggers received 20 April 2012. Verification to be done when suitably qualified independent persons identified.	N/A
4. Actions upon breakdown of monitoring equipment	Receipt of notification, and inspection. Check water take records.	N/A
5. Access to monitoring equipment	Site inspection	Yes
6. Format of monitoring records	Examination of records	Yes
7. Best practicable option and efficient use	Site inspections and liaison with consent holder	Yes
8. Restrictions on intake modification	Site inspection. Report on consultants inspection of 5/6 February 2013.	Yes
9. Report on altering intake to minimise entrainment of juvenile fish by 31 January 2013	Receipt of report. Scoping report received 31 January 2013; costs/benefits report received 6 June 2013.	Yes
10. Development of a monitoring programme and annual review	Receipt of monitoring programme. Monitoring programme under development at end of review period.	N/A
11. Consultation on monitoring programme to include iwi	Liaison with consent holder. Monitoring programme under development at end of review period.	N/A
12. Annual meeting about monitoring programme	Meeting occurs as required. Meeting not required within review period.	N/A
13. Financial contribution to riparian planting and management	Receipt of contribution	Yes
14. Review of consent in respect of intake structure	N/A	N/A
15. Optional review provision	Next review option available June 2017	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**

N/A = not applicable

Table 10 Summary of performance for Consent **1213-2** Take from Kapuni Stream in emergency

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Limit on maximum abstraction rate	Metering by consent holder	N/A
2. Reinstatement of normal water supply as soon as practicable	Site inspection	N/A
3. Notify Council and report(s) on exercise of consent	Receipt of notification/reports	N/A
4. A flow meter is to be installed and maintained	Site inspections	Yes
Overall assessment of consent compliance and environmental performance in respect of this consent		**N/A**

N/A = not applicable

Table 11 Summary of performance for Consent **1213-3** Take from Kapuni Stream in emergency

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Limit on maximum abstraction rate	Metering by consent holder	N/A
2. Take only when main supply fails	Site inspection. Consent not exercised	N/A
3. Keep and provide record of take	Inspection and receipt of record	N/A
4. Best practicable optiion	Site inspection and liaison with consent holder	N/A
5. Notify Council and report on exercise of consent	Receipt of notification/reports	N/A
6. Optional review provision	Next review option available June 2017	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**N/A**

N/A = not applicable

Table 12 Summary of performance for Consent **4719-1** Take from groundwater for remediation

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Notify Council prior to abstracting from any new bores	Water not abstracted from new bore during year under review	N/A
2. Optional review provision	Option not available before consent expiry 2011	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**

N/A = not applicable

Table 13 Summary of performance for Consent **4719-2** Take from groundwater for remediation

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Limit on maximum abstraction rate	Metering by consent holder.	Yes
2. Keep and provide record of take	Inspection and receipt of record	Yes
3. Best practicable option	Site inspection and liaison with consent holder	Yes
4. Optional review provision	Next option available June 2017	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**

N/A = not applicable

Table 14 Summary of performance for Consent **0598-2** Discharge stormwater to Kapuni Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Optional review provision	Option not available before consent expiry 2011	N/A
2. Discharge concentration limits	Site inspections and monitoring results	Yes
3. Discharge ammonia concentration	Site inspections and monitoring results	Yes
4. Discharge sodium concentration limit	Site inspections and monitoring results	Yes
5. Company shall monitor the stream	Review of Company records and receipt of reports from Stark Environmental	Yes
6. Company shall minimise discharge of phosphate	Site inspections and monitoring results	Yes
7. Discharge shall no have an adverse effect on the freshwater ecological diversity of the stream	Site inspections and bio-monitoring results	Yes
8. Discharge structure shall be designed and maintained to minimise effects	Site inspections and monitoring results	Yes
9. Remedial works to be undertaken in event that discharge effects stream banks or channel	Remedial works not required during year under review	N/A
10. Discharge to be undertaken in accordance with effluent management plan	Site inspections and monitoring results	Yes
11. Review provision for effluent management plan	Optional review of management plan not sought during year under review	N/A
12. Company to provide water treatment programme to Council for review when changes to process or chemicals proposed	Notifications from Company when changes to chemicals proposed.	Yes
13. Variation provision if required from review as set out in Condition 12	Variation not required as a result of proposed water treatment chemical changes	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**

N/A = not applicable

Table 15 Summary of performance for Consent **0598-3** Discharge stormwater to Kapuni Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Limit on discharge volume	Metering by consent holder	Yes
2. Best practicable option	Inspection and liaison with consent holder	Yes
3. Discharge concentration limits	Inspection and chemical sampling	Yes
4. Receiving water concentration limits	Inspection and chemical sampling	Yes
5. Control on effect of discharge in receiving water	Inspection, chemical sampling and bio-monitoring	Yes
6. Company shall monitor the stream	Review of Company records	Yes
7. Company shall minimise discharge of phosphate	Inspections and monitoring results	Yes
8. Discharge to be in accordance with an Effluent Disposal Management Plan	Inspections and liaison with consent holder	Yes
9. Provision of Management Plan for certification	Receipt of Management Plan. Reviewed Plan received 18 Dec 2012	Yes
10. Review of Management Plan by DoC and Fish & Game NZ	Plan forwarded 21 May 2013	N/A
11. Company to provide water treatment programme to Council for review when changes to process or chemicals proposed	Notifications from Company when changes to chemicals proposed. Notifications received 21 Sep 2012 (1 cooling water) and 2 Apr 2013 (4 boiler water)	Yes
12. Optional review provision	Next option available June 2017	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**

N/A = not applicable

Table 16 Summary of performance for Consent **1766-2** Discharge wastewater to Kapuni Stream in contingency events

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Optional review provision	Option not available before consent expiry 2011	N/A
2. Consent to only be exercised in heavy rainfall when spray irrigation not possible	Liaison with Company and monitoring results. Consent not exercised	N/A
3. Discharge concentration limits	Liaison with Company and monitoring results	N/A
4. Discharge ammonia concentration limit	Liaison with Company and monitoring results	N/A
5. Discharge nitrite concentration limit	Liaison with Company and monitoring results	N/A
6. Discharge shall not have an adverse effect on the freshwater ecological diversity of the stream	Site inspections and bio-monitoring results	N/A

Condition requirement	Means of monitoring during period under review	Compliance achieved?
7. Discharge to be undertaken in accordance with effluent management plan	Site inspections and monitoring results	N/A
8. Review provision for effluent management plan	Provision not invoked	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**N/A**

N/A = not applicable

Table 17 Summary of performance for Consent **1766-3** Discharge wastewater to Kapuni Stream in contingency events

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Constraint on when discharge occurs	Liaison with Company and monitoring results. Consent not exercised	N/A
2. Limit on discharge rate	Metering by Company	N/A
3. Best practicable option	Inspection and liaison with Company	N/A
4. Discharge concentration limits	Inspection and chemical sampling	N/A
5. Receiving water concentration limits	Inspection and chemical sampling	N/A
6. Control on effect of discharge in receiving water	Inspection and bio-monitoring results	N/A
7. Discharge to be in accordance with an Effluent Disposal Management Plan	Inspections and liaison with consent holder	N/A
8. Provision of Management Plan for certification	Receipt of Management Plan. Plan received 18 Dec 2012.	Yes
9. Review of Management Plan by DoC and Fish & Game NZ	Plan forwarded 21 May 2013	N/A
10. Optional review provision	Next optional review June 2017	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**

N/A = not applicable

Table 18 Summary of performance for Consent **0597-2** Discharge wastewater to land

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Best practicable option	Site inspections and liaison with consent holder	Yes
2. Company shall maintain an effluent management plan with the objective of minimising discharges	Site inspections and liaison with consent holder	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
3. Discharge to be undertaken in accordance with effluent management plan	Site inspections and liaison with consent holder, including viewing records	Yes
4. Consent holder shall review the effluent management plan annually	Liaison with consent holder. Contingency plan reviewed by Council	Yes
5. No odour beyond boundary of the site	Site inspections and complaints register	Yes
6. Daily effluent application rate	Site inspections and liaison with consent holder, including viewing records	Yes
7. Discharge shall no result in spray drift beyond the boundary of the property	Site inspections and liaison with consent holder, including complaints register	Yes
8. Defines the edge of the spray zone	Site inspections	Yes
9. Limit on the concentration of total nitrogen	Site inspections and liaison with consent holder, sampling results	Yes
10. Consent holder shall provide details of water treatment programme and any proposed changes to the Council for review	Liaison with the consent holder, and information supplied to the Council by Ballance	Yes
11. Consent holder shall provide details of chemical cleaning programmes and any proposed changes to the Council for review	Liaison with the consent holder, and information supplied to the Council by Ballance	Yes
12. Optional Council review as a result of Conditions 10 and 11	Optional review not sought by Council during monitoring year	N/A
13. Lapse date	Consent has been exercised	N/A
18. Optional review provision	Option not available before consent expiry 2011	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**

N/A = not applicable

Table 19 Summary of performance for Consent **0597-3** Discharge wastewater to land

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Disposal within defined area	Inspection	Yes
2. Limit on discharge rate	Metering by consent holder	Yes
3. Best practicable option	Inspection and liaison with consent holder	Yes
4. Maximisation of discharge to land, and minimisation of discharge to stream	Inspection and metering by consent holder.	Yes
5. Discharge to be in accordance with an Effluent Disposal Management Plan	Inspections and liaison with consent holder	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
6. Provision of Management Plan for certification	Receipt of Plan. Plan received 18 Dec 2012.	Yes
7. Review of Management Plan by DoC and Fish & Game NZ	Plan forwarded 21 May 2013	N/A
8. No odour beyond boundary of the site	Site inspections and complaints register	Yes
9. No spray drift beyond boundary of the site	Site inspections and complaints register	Yes
10. Defines the edge of the spray zone	Site inspections	Yes
11. Limit on the application of total nitrogen	Site inspections and liaison with consent holder, sampling results	Yes
12. Consent holder shall provide details of water treatment programme and any proposed changes to the Council for review	Liaison with the consent holder, and information supplied to the Council by Balance. Notifications received 21 Sep 2012 (1 cooling water) and 2 Apr 2013 (4 boiler water)	Yes
13. Consent holder shall provide details of chemical cleaning programmes and any proposed changes to the Council for review	Liaison with the consent holder, and information supplied to the Council by Ballance	Yes
14. Optional review provision	Option next available June 2017	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**

N/A = not applicable

Table 20 Summary performance for Consent 4046-3 Discharge emissions to air

Condition requirement	Means of monitoring during period under review		Compliance achieved?
1. Best practicable option	Site inspections and liaison with consent holder		Yes
2. Prior to changing plant processes or operations that may change nature of discharge the Company shall consult with the TRC	Liaison with consent holder		Yes
3. Limits the mass emission of ammonia from the dust scrubber and blow down tank vent	Liaison with the consent holder and monitoring of discharges by K2 Environmental for Ballance		Yes
4. Limits the concentration of ammonia beyond the site boundary	Liaison with consent holder and monitoring at boundary by Ballance and Council		No, two breaches
5. Consent holder to establish monitoring sites for ammonia	Due by 12 February 2013. Sites established in September 2012.		Yes
6. Limits the concentration and mass of urea emissions	Liaison with consent holder and monitoring of discharges by K2 Environmental for Ballance	Uncertain. Two breaches reported, one disproved on investigation of sampling method; other "breach" possibly caused by same fault.	
7. Limits the concentration of carbon monoxide and nitrogen dioxide beyond the plant boundary	Liaison with consent holder. Monitoring of carbon monoxide by Council. NOx not monitored as previous results indicate compliance.		Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
8. Limits the concentration of other contaminants beyond the plant boundary	Liaison with consent holder and inspection	Yes
9. Discharge not to give rise to odour beyond the plant boundary	Inspections.	No. Two breaches.
10. Written report required every three years detailing emissions and measure undertaken to reduce them	Received 1 June 2012	Yes
11. Consent holder to convene meeting three-yearly	Due before February 2015	N/A
12. Shall maintain and operate a site contingency plan and review it annually	Site inspections and correspondence from the Company	Yes
13. Optional review provision	Next scheduled in June 2017, if required	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**Improvement desirable**

N/A = not applicable

During the 2012-2013 period under review, the Company demonstrated a good level of environmental performance and compliance with the resource consents as defined in Section 1.1.4. During the year under review there were a number of minor non-compliances with respect to the discharge of emissions to air. The non-compliances were all self-notified by the Company. In all cases Ballance undertook to remedy the problems immediately as well as taking steps to prevent a re-occurrence where possible.

3.5 Recommendations from the 2010-2012 Annual Report

In the 2009-2010 Annual Report, it was recommended:

1. THAT monitoring of air emissions from the Ammonia Urea Plant of Ballance Agri-Nutrients Limited in the 2012-2013 year continue at the same level as in 2011-2012.

2. THAT monitoring of abstractions for and discharges from the Ammonia Urea Plant of Ballance Agri-Nutrients Limited in the 2012-2013 year continue at the same level as in 2011-2012.

These recommendations were implemented during the 2012-2013 monitoring year.

3.6 Alterations to monitoring programmes for 2013-2014

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 RMA, 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 Ballance Agri-Nutrients (Kapuni) Limited the programme for 2012-2013 was largely unchanged from that for 2011-2012.

Two changes were made, both to satisfy concerns of submitters to consents issued in 2012:

As a requirement on replacement air discharge permit **4046-3**, two static monitoring locations were established at the boundary of the site in September 2012, for the purpose of long-term monitoring of atmospheric ammonia at ground level.

As a requirement on replacement water permit **0596-3**, an investigation into effects on juvenile fish entrainment, and appropriate future monitoring, was begun in relation to increased water abstraction through the Waingongoro River intake structure. The investigation is due to be completed in 2013-2014.

It is now proposed that for 2013-2014, the monitoring remain essentially the same.

A recommendation to this effect is attached to this report.

3.7 Exercise of optional review of consent

None of the consents allow for an optional review in June 2014.

4. Recommendations

1. THAT monitoring of air emissions from the Ammonia Urea Plant of Ballance Agri-Nutrients Limited in the 2013-2014 year continue at the same level as in 2012-2013.

2. THAT monitoring of abstractions for and discharges from the Ammonia Urea Plant of Ballance Agri-Nutrients Limited in the 2013-2014 year continue at the same level as in 2012-2013.

Glossary of common terms and abbreviations

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

Approach velocity	The speed at which water moves towards an intake structure, expressed in m/s.
AUP	Ammonia urea plant.
Ballance	Ballance Agri-Nutrients Limited.
Biomonitoring	Assessing the health of the environment using aquatic organisms.
Bund	A wall around a tank to contain its contents in the case of a leak.
Condy	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20˚C and expressed in MS/m.
Cu*	Copper.
DRP	Dissolved reactive phosphorus.
EPT	Ephemeroptera, Plecoptera and Trichoptera; species of mayflies, stoneflies and caddisflies sensitive to organic pollution.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
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.
Hg	Mercury.
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.
l/s	Litres per second.
MCI	Macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats.
mS/m	MilliSiemens per metre.
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
NH_4	Ammonium, normally expressed in terms of the mass of nitrogen (N).
NH_3	Un-ionised ammonia, normally expressed in terms of the mass of ammonia (NH_3).
Ni	Nickel.
NO_3	Nitrate, normally expressed in terms of the mass of nitrogen (N).
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
O&G	Oil and grease, defined as anything that will dissolve into a particular organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons).

pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.
Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of the 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.
RMP	Riparian management plan.
SS	Suspended solids.
Sweep velocity	The speed at which water moves past an intake structure, expressed in m/s.
Temp	Temperature, measured in ˚C (degrees Celsius).
TRC	Taranaki Regional Council.
Turb	Turbidity, expressed in NTU.
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.
Zn*	Zinc

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

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

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Appendix I

Resource consents held by Ballance Agri-Nutrients (Kapuni) Ltd

Water Permit

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

Name of Consent Holder:	Ballance Agri-Nutrients (Kapuni) Limited P O Box 439 HAWERA 4640
Decision Date:	31 August 2012
Commencement Date:	31 August 2012

Conditions of Consent

Consent Granted:	To take water from the Waingongoro River for operation of an ammonia/urea plant at or about (NZTM) 1707784E-5628870N
Expiry Date:	1 June 2035
Review Date(s):	June 2013, June 2017, June 2023, June 2029
Site Location:	309 Palmer Road, Hawera
Legal Description:	Lot 1 DP 14159 Blk XIII Ngaere SD (Site of take)
Catchment:	Waingongoro

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

General condition

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

Special conditions

1. The volume of water taken shall not exceed 4,000 cubic metres per day.

2. Before exercising this consent the consent holder shall install, and thereafter maintain a water meter and a datalogger at a location that measures all water taken. The water meter and datalogger shall be tamper-proof and shall measure and record the rate (in litres per second) and volume of water (in cubic metres per day) taken to an accuracy of ± 5percent. 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 ± 5percent.

   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.

5. The water meter and datalogger shall be accessible to Taranaki Regional Council officers at all reasonable times for inspection and/or data retrieval.

6. 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; and

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

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

8. The consent holder shall ensure that no modification is made to the intake that:

   (a) increases the aperture size of any intake screen; or

   (b) increases velocity of water toward any screen (approach velocity) or across any screen (sweep velocity); or

   (c) in any other way that could increase the likelihood of juvenile fish entering the intake or being trapped against the screen.

9. By 31 January 2013 the consent holder shall provide the Chief Executive, Taranaki Regional Council with a report, including recommendations, on an investigation of the costs and benefits of altering the intake to meet design guidelines for minimising the entrainment of juvenile fish.

10. The consent holder shall ensure that a monitoring programme is developed and undertaken that determines compliance with the conditions of this consent and identifies, as far as practicable, the environmental effects resulting from its exercise. The monitoring programme shall be reviewed annually.

11. In developing the monitoring programme referred to in condition 10 the consent holder shall carry out reasonable consultation with Ngati Ruanui and Ngaruahine that includes submitting the monitoring programme to both Iwi for comment and allowing one month for a response. The consent holder shall ensure any comments received are provided to the Chief Executive, Taranaki Regional Council.

12. At least once every year, the consent holder shall convene a meeting with representatives of the Taranaki Regional Council, Fish and Game, Department of Conservation, Ngati Ruanui and Ngaruahine. The meeting shall be for the purpose of discussing and generally informing the parties about the consent holder's monitoring data and the monitoring programme relating to the operation, monitoring and environmental effects of the consented activity.

13. The consent holder shall make ten annual payments of $30,000 (GST exclusive) to the Taranaki Regional Council as a financial contribution for the purpose of providing riparian planting and management in the Waingongoro River catchment. The first payment shall be made within 60 days of the commencement of this consent, and subsequent payments shall be made by 1 September each year.

14. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review special condition 8 (re changes to the intake) of this resource consent during the month of June 2013, for the purpose of requiring the modification of the intake to reduce the risk of fish entrainment.

15. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2017 and/or June 2023 and/or June 2029 for the purposes of:

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

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

Signed at Stratford on 31 August 2012

For and on behalf of
Taranaki Regional Council

_____

Director-Resource Management

Consent 0596-2

TARANAKI
REGIONAL
COUNCIL

PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE 0-6-765 7127
FAX 0-6-765 5097

Water Permit

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

Name of Consent Holder:	Ballance Agri-Nutrients Kapuni Limited P O Box 439 HAWERA
Consent Granted Date:	23 September 1991

Conditions of Consent

Consent Granted:	To take up to 3,456 cubic metres/day of water from the Waingongoro Stream at a maximum rate of 100 litres/second for operation of an ammonia/urea plant at Palmer Road, Kapuni at or about GR: Q20:178-905
Expiry Date:	1 June 2011
Review Date(s):	June 1993, June 1999, June 2005
Site Location:	Umutahi Rd, Matapu
Legal Description:	Pt Sec A7 Blk XIII Ngaere SD
Catchment:	Waingongoro

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

General conditions

a) The consent holder shall provide, on request by the Chief Executive, Taranaki Regional Council, plans, specifications and maintenance programmes of works associated with the exercise of the consent, showing that the conditions of the consent are able to be met.

b) The standards, techniques and frequency of monitoring of the consent shall be to the specific approval of the Chief Executive, Taranaki Regional Council.

c) The actual and reasonable cost of administration, supervision and monitoring of this consent, deemed necessary by the Chief Executive, Taranaki Regional Council, shall be met by the consent holder.

d) This consent may be cancelled in writing to the consent holder by the Council if the consent is not exercised within twelve months of the date of granting or such longer time as the Chief Executive, Taranaki Regional Council, may approve.

e) This consent may be terminated by the Council upon not less than six months notice in writing to the consent holder if, in the opinion of the Council, the public interest so requires, but without prejudice to the consent holder to apply for a further consent in respect of the same matter.

Special conditions

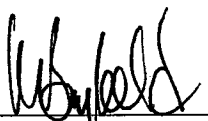
1. That the conditions of this right shall be subject to review on 1 June 1993, 1 June 1999 and 1 June 2005.

2. That the intake structure from the Waingongoro Stream shall be so designed, constructed and maintained as to minimise disturbance to the stability of the bed and banks of the stream channel, both at low flows and design flood levels, and as to minimise the entrapment of fish.

3. That any remedial works for the correction of stream channel or bank stability problems in the Waingongoro Stream which are directly attributable to the intake structure, or to any other work undertaken in the channel in connection with the construction or operation of the intake structure, shall the responsibility of the Grantee.

Transferred at Stratford on 5 July 2001

For and on behalf of
Taranaki Regional Council



Chief Executive

Discharge Permit

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

Name of Consent Holder:	Ballance Agri-Nutrients (Kapuni) Limited P O Box 439 HAWERA 4640
Decision Date:	31 August 2012
Commencement Date:	31 August 2012

Conditions of Consent

Consent Granted:	To discharge treated plant production effluent and contaminated stormwater from an ammonia/urea plant by spray irrigation onto and into land at or about (NZTM) 1699807E-5629386N, 1700174E-5629156N, 1700195E-5629448N, 1700572E-5629619N, 1700685E-5629761N, 1700700E-5629443N
Expiry Date:	1 June 2035
Review Date(s):	June 2017, June 2023, June 2029
Site Location:	309 Palmer Road, Kapuni
Legal Description:	Pt Lot 1 DP 13121 (Discharge source & site) Lots 1 & 2 DP 15057 Sec 21 Blk XV Kaupokonui SD (Discharge site)
Catchment:	Kapuni

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. This consent authorises discharges to the areas of land shown in Appendix 1 attached to this document.

2. The discharge shall not exceed 1,470 cubic metres per day.

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

4. The consent holder shall ensure that the discharge of contaminants to land in accordance with this consent is maximised and, conversely, the discharge of contaminants to the Kapuni Stream in accordance with consent 1766-3 is minimised.

5. Subject to the other conditions this consent, this consent shall be exercised in accordance with an 'Effluent Disposal Management Plan' (the 'Management Plan') that has been approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The Management Plan shall detail methods and procedures undertaken by the consent holder to ensure that the conditions of this consent are met and can be shown to be met, including but not necessarily be limited to details of:

   (a) effluent application rate (volume and components);
   (b) application method;
   (c) pasture and soil husbandry;
   (d) run-off prevention;
   (e) effluent monitoring;
   (f) soil and herbage monitoring;
   (g) groundwater monitoring;
   (h) how the discharge of contaminants to land is maximised;
   (i) surface water monitoring (chemical and biological);
   (j) management of contingency events;
   (k) reporting on the exercise of consent; and
   (l) the size and adequacy of the irrigation area.

   Note: The Management Plan required by this condition may be combined with Management Plans required by the conditions of other consents held by the consent holder for the site.

6. Within 3 months of this consent being issued, the Management Plan required by condition 5 shall be submitted by the consent holder to the Taranaki Regional Council for certification by the Chief Executive.

7. A copy of any reviewed Management Plan, in accordance with conditions 5 and 6, shall be provided to the Department of Conservation and Fish and Game New Zealand (Taranaki Region), for the Taranaki Regional Council to take into account any comments received (within a two week timeframe from when the Plan was provided).

8. The discharge authorised by this consent shall not give rise to an odour that is offensive or objectionable, at or beyond the boundary of the property or properties on which spray irrigation is occurring.

9. The exercise of this consent shall not result in any spray drift beyond the boundary of the property or properties on which this consent is being exercised.

10. The discharge shall not occur within:

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

11. The Total Nitrogen applied to any hectare of land shall not exceed:

    (a) 1000 kilograms in any 12-month period for 'cut and carry areas'; or
    (b) 300 kilograms in any 12-month period for any other land (including grazed pasture).

    For the purposes of this consent 'cut and carry areas' is land that is not grazed and any vegetation is routinely cut and removed.

12. The consent holder shall provide to the Chief Executive, Taranaki Regional Council for review, programmes of water treatment used at the Ammonia Urea Plant, including raw water, boiler water and cooling water. Further, the consent holder shall notify the Chief Executive, Taranaki Regional Council, of any change in water treatment chemical, or increase in maximum concentration of any water treatment chemical used, at least one month prior to change of a water treatment programme.

13. The consent holder shall provide to the Chief Executive, Taranaki Regional Council, for review, programmes of chemical cleaning used at the Ammonia Urea Plant. Further, the consent holder shall notify the Chief Executive, Taranaki Regional Council, of any change in chemical cleaning agent, or increase in maximum concentration of any chemical cleaning agent used, at least one month prior to change of a chemical cleaning programme.

14. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2017 and/or June 2023 and/or June 2029 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 31 August 2012

For and on behalf of
Taranaki Regional Council

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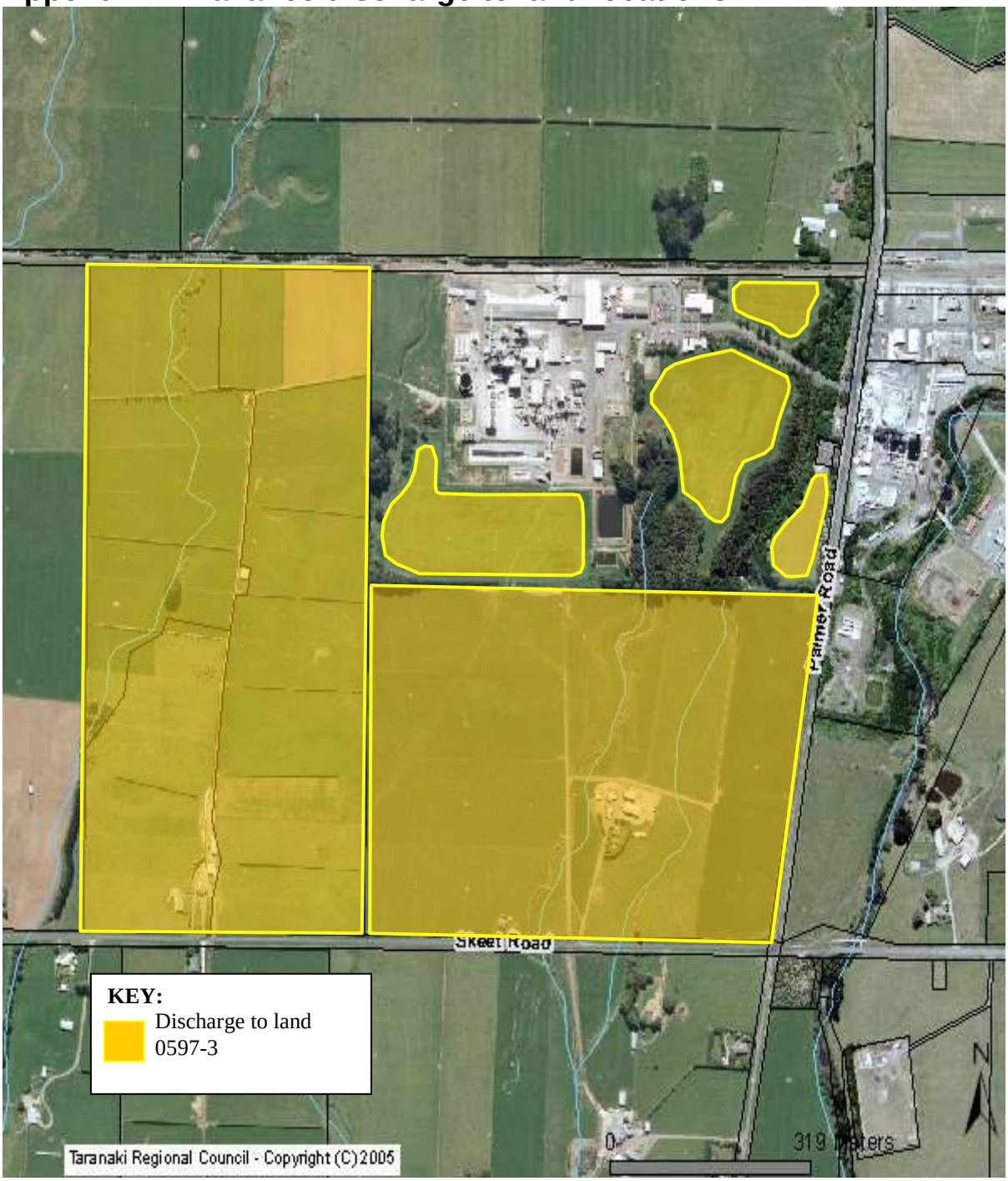
Director-Resource Management

Appendix 1- Ballance discharge to land locations



Consent 0597-2

TARANAKI REGIONAL COUNCIL

CHIEF EXECUTIVE
PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE 06-765 7127
FAX 06-765 5097

Please quote our file number on all correspondence

Discharge Permit

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

Name of Consent Holder: Ballance Agri-Nutrients (Kapuni) Limited
P O Box 439
HAWERA

Change To Conditions Date: 21 December 2004 [Granted: 23 September 1991]

Conditions of Consent

Consent Granted: To discharge treated plant production effluent and contaminated stormwater from an ammonia/urea plant by spray irrigation onto and into land at or about GR: Q20:104-912

Expiry Date: 1 June 2011

Review Date(s): June 1993, June 1999, June 2005

Site Location: Palmer Road, Kapuni

Legal Description: Pt Lot 1 DP 13121 Lots 1 & 2 DP 15057 Sec 21 Blk XV Kaupokonui SD

Catchment: Kapuni

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

General conditions

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

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

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

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

Special conditions 

1. The consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to avoid or minimise the discharge of nitrogen or other contaminants into groundwater or any other water body to avoid or minimise any adverse effects on water quality.

2. The consent holder shall maintain an effluent disposal management plan, to the approval of the Chief Executive, Taranaki Regional Council, outlining the management of the system, which shall demonstrate ability to comply with consent conditions and shall address the following matters:

a) effluent application rate [volume and components] and method
b) pasture and soil husbandry
c) prevention of run-off
d) effluent monitoring
e) soil and herbage monitoring
f) groundwater monitoring
g) surface water monitoring [chemical and biological]
h) contingency events
i) reporting on exercise of consent

An objective of the plan shall be to maximise discharges to land and to minimise discharges to surface water under consent 1766.

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

4. The consent holder shall review the spray irrigation management plan described in special condition 2 of this consent annually and shall provide the reviewed plan to the Chief Executive, Taranaki Regional Council, 1 June.

5. The consent holder shall ensure there will be no offensive or objectionable odour at or beyond the boundary of the property or properties on which spray irrigation is occurring.

6. The discharge authorised by this consent shall not give rise to an effluent application rate exceeding 1,470 cubic metres per day.

7. The consent holder shall ensure there will be no spray drift as a result of the irrigation of treated effluent and contaminated stormwater at or beyond the boundary of the property or properties on which spray irrigation is occurring.

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

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

9. The effluent application rate of total nitrogen onto pasture, as measured in kilograms of nitrogen per hectare per year, shall not exceed the following levels:

cut and carry areas	1,000 kgN/ha/yr
grazed pasture	300kgN/ha/yr

10. The consent holder shall forward to the Chief Executive, Taranaki Regional Council for review programmes of water treatment used at the Ammonia Urea Plant, including raw water, boiler water and cooling water. Further, the consent holder shall notify the Chief Executive, Taranaki Regional Council, of any change in water treatment chemical, or increase in maximum concentration of any water treatment chemical used, at least one month prior to change of a water treatment programme.

11. The consent holder shall forward to the Chief Executive, Taranaki Regional Council, for review programmes of chemical cleaning used at the Ammonia Urea Plant. Further, the consent holder shall notify the Chief Executive, Taranaki Regional Council, of any change in chemical cleaning agent, or increase in maximum concentration of any chemical cleaning agent used, at least one month prior to change of a chemical cleaning programme.

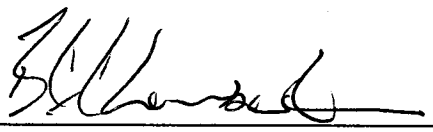
12. The conditions of this consent may be reviewed at the time of notification to the Taranaki Regional Council under special conditions 10 and 11 of this consent of proposed changes in water treatment or chemical cleaning programmes.

13. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

14. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2005 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 21 December 2004

For and on behalf of
Taranaki Regional Council



Chief Executive

Discharge Permit

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

Name of Consent Holder:	Ballance Agri-Nutrients (Kapuni) Limited P O Box 439 HAWERA 4640
Decision Date:	31 August 2012
Commencement Date:	31 August 2012

Conditions of Consent

Consent Granted:	To discharge: • stormwater from non-process areas; and • raw water treatment plant wastewater, from an ammonia/urea plant to the Kapuni Stream and into an unnamed tributary of the Kapuni Stream at or about (NZTM) 1700851E-5629366N and 1700454E-5629380N
Expiry Date:	1 June 2035
Review Date(s):	June 2017, June 2023, June 2029
Site Location:	309 Palmer Road, Kapuni
Legal Description:	Pt Lot 1 DP 13121 & Lot 1 DP 15254 (Discharge sites)
Catchment:	Kapuni

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 shall not exceed 1,920 m^3 per day to the Kapuni Stream, or 4,080 m^3 per day to an unnamed tributary of the Kapuni Stream.

2. 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.

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

Constituent	Standard
pH	Within the range 6.5 to 9.0
Zinc	Concentration not greater than 0.5 gm^{-3}

4. Beyond a mixing zone of 200 metres downstream from the discharge point, the discharge shall not cause constituents in the Kapuni Stream to exceed the maximum concentrations shown in the table below.

Constituent	Maximum concentration
Un-ionised ammonia	0.025 gm^{-3}
Sodium	40 gm^{-3}

5. After allowing for reasonable mixing, within a mixing zone extending 200 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 monitor the Kapuni Stream for pH, unionised ammonia, and sodium, at locations and at a frequency that enables compliance with condition 4 to be determined.

7. The consent holder shall manage its stormwater disposal system in such a manner as to minimise the discharge of dissolved reactive phosphorus to the Kapuni catchment.

8. Subject to the other conditions this consent, this consent shall be exercised in accordance with an 'Effluent Disposal Management Plan' (the 'Management Plan') that has been approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The Management Plan shall detail methods and procedures undertaken by the consent holder to ensure that the conditions of this consent are met and can be shown to be met, including but necessarily limited to details of:

   (a) exclusion of contaminated stormwater;
   (b) minimisation of dissolved reactive phosphorus in the discharge;
   (c) monitoring of the discharge;
   (d) monitoring of the Kapuni Stream;
   (e) discharge to the Kapuni tributary in times of extreme rainfall; and
   (f) reporting on exercise of consent.

   Note: The Management Plan required by this condition may be combined with Management Plans required by the conditions of other consents held by the consent holder for the site.

9. Within 3 months of this consent being issued, the Management Plan required by condition 8 shall be submitted by the consent holder to the Taranaki Regional Council for certification by the Chief Executive.

10. A copy of any reviewed Management Plan, in accordance with conditions 8 and 9, shall be provided to the Department of Conservation and Fish and Game New Zealand (Taranaki Region), for the Taranaki Regional Council to take into account any comments received (within a two week timeframe from when the Plan was provided).

11. The consent holder shall provide to the Chief Executive, Taranaki Regional Council for review programmes of raw water treatment used at the Ammonia Urea Plant. Further, the consent holder shall notify the Chief Executive, Taranaki Regional Council, of any change in water treatment chemical, or increase in maximum concentration of any water treatment chemical used, at least one month prior to change of a water treatment programme.

12. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2017 and/or June 2023 and/or June 2029, 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 31 August 2012

For and on behalf of
Taranaki Regional Council

_____

Director-Resource Management

Consent 0598-2

TARANAKI REGIONAL COUNCIL

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NEW ZEALAND
PHONE 0-6-765 7127
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Discharge Permit

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

Name of Consent Holder:	Ballance Agri-Nutrients Kapuni Limited P O Box 439 HAWERA
Consent Granted Date:	23 September 1991

Conditions of Consent

Consent Granted: To discharge a total of up to 6,000 cubic metres/day of uncontaminated stormwater and raw water treatment plant wastewater from an ammonia/urea plant at Palmer Road Kapuni:

a) To the Kapuni Stream at a rate of up to 1,920 cubic metres/day at or about GR: Q20:109-912
b) To an unnamed tributary of the Kapuni Stream at a rate of up to 4,080 cubic metres/day when discharge rate to the Kapuni Stream exceeds 1,920 cubic metres/day at or about GR: Q20:105-913

Expiry Date:	1 June 2011
Review Date(s):	June 1993, June 1999, June 2005
Site Location:	Palmer Road, Kapuni
Legal Description:	a) Lot 1 DP 15254 Pt Sec 11 Blk XVI Kaupokonui SD b) Lot 20 Blk XV Kaupokonui SD
Catchment:	Kapuni

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

General conditions

a) The consent holder shall provide, on request by the Chief Executive, Taranaki Regional Council, plans, specifications and maintenance programmes of works associated with the exercise of the consent, showing that the conditions of the consent are able to be met.

b) The standards, techniques and frequency of monitoring of the consent shall be to the specific approval of the Chief Executive, Taranaki Regional Council.

c) The actual and reasonable cost of administration, supervision and monitoring of this consent, deemed necessary by the Chief Executive, Taranaki Regional Council, shall be met by the consent holder.

d) This consent may be cancelled in writing to the consent holder by the Council if the consent is not exercised within twelve months of the date of granting or such longer time as the Chief Executive, Taranaki Regional Council, may approve.

e) This consent may be terminated by the Council upon not less than six months notice in writing to the consent holder if, in the opinion of the Council, the public interest so requires, but without prejudice to the consent holder to apply for a further consent in respect of the same matter.

Special conditions

1. That the conditions of this right shall be subject to review on 1 June 1993, 1 June 1999 and 1 June 2005.

2. That components of the discharge shall not exceed the following concentrations:

Discharge component	**Maximum concentration**
pH (range)	6.5 - 9.0
Zinc	0.5 gm^{-3}

3. That the discharge shall not cause the concentration of unionised ammonia in the Kapuni Stream or tributary to exceed 0.025 gm^{-3} outside of a mixing zone of 200 metres downstream from the discharge point.

4. That the discharge shall not cause the concentration of sodium in the Kapuni Stream or tributary to exceed 40 gm^{-3} outside of a mixing zone 200 metres downstream from the discharge point.

5. That the Grantee shall monitor the Kapuni Stream for pH, unionised ammonia, and sodium, to the satisfaction of the Chief Executive, Taranaki Regional Council.

6. That the Grantee shall manage its stormwater disposal system in such a manner as to minimise the discharge of free phosphate to the Kapuni Catchment.

7. The discharge shall not cause a significant detrimental effect to the freshwater ecological diversity of the Kapuni Stream catchment.

8. That the discharge structure to the Kapuni Stream shall be so designed, constructed and maintained as to minimise disturbance to the stability of the bed and banks of the stream channel, both at low flows and design flood levels, and as to allow the passage of fish.

9. That any remedial works for the correction of stream channel or bank stability problems in the Kapuni Stream which are directly attributable to the discharge structure, or to any other work undertaken in the channel in connection with the construction or operation of the discharge structure, shall be the responsibility of the Grantee.

10. That this right shall be exercised in accordance with the procedures of an effluent disposal management plan, to the written approval of the Chief Executive, Taranaki Regional Council, which shall address the following matters:

    a) exclusion of contaminated stormwater
    b) minimisation of free phosphate in the discharge
    c) monitoring of the discharge
    d) monitoring of the Kapuni Stream
    e) discharge to the Kapuni tributary in times of extreme rainfall
    f) reporting on exercise of right

11. That the effluent disposal management plan described in special condition 10 of this right shall be submitted to the Chief Executive, Taranaki Regional Council before 1 December 1991 for approval, and thereafter shall be subject to review upon three months' notice by either the Grantee or the Taranaki Regional Council.

12. That the Grantee shall forward to the Chief Executive, Taranaki Regional Council for review programmes of raw water treatment used at the Ammonia Urea Plant. Further, the Grantee shall notify the Chief Executive, Taranaki Regional Council of any change in raw water treatment chemical, or increase in maximum concentration of any raw water treatment chemical use, at least one month prior to change of a raw water treatment programme.

13. That the Grantee, if so required by the Chief Executive, Taranaki Regional Council upon receipt of any programme submitted for review under special condition 12 of this right, shall apply forthwith for a variation of this right to provide for any raw water treatment chemical nominated in the programme as directed by the Chief Executive, Taranaki Regional Council.

Transferred at Stratford on 5 July 2001

For and on behalf of
Taranaki Regional Council

Chief Executive

Water Permit

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

Name of Consent Holder:	Ballance Agri-Nutrients (Kapuni) Limited P O Box 439 HAWERA 4640
Decision Date:	31 August 2012
Commencement Date:	31 August 2012

Conditions of Consent

Consent Granted:	To take and use water from the Kapuni Stream (at times when the normal water supply has failed) for operation of an ammonia/urea plant at or about (NZTM) 1701490E-5630833N
Expiry Date:	1 June 2035
Review Date(s):	June 2017, June 2023, June 2029
Site Location:	309 Palmer Road, Kapuni
Legal Description:	Lot 2 DP 10570 Blk XVI Kaupokonui SD (Site of take) Pt Lot 1 DP 13121 (Site of use)
Catchment:	Kapuni

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 rate of water taken shall not exceed 33 litres per second.

2. This consent authorises taking only at times when the consent holder's water supply from the Waingongoro River (under consent 0596-3) has failed.

3. The consent holder shall maintain a record of taking to an accuracy of ±5%, including date and daily volume taken. The record shall be provided to the Chief Executive, Taranaki Regional Council, no later than 31 July each year, or earlier upon request.

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

5. Each time the consent is exercised the consent holder shall immediately advise the Chief Executive, Taranaki Regional Council, and within five days provide a written report. The report shall detail how the normal supply failed and the work programme proposed to reinstate it as soon as practicably achievable. If the time taken to reinstate the normal supply is longer than five days the consent holder shall provide progress reports in a form and at a frequency as may be directed by the Chief Executive, Taranaki Regional Council.

6. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2017 and/or June 2023 and/or 2029, for the purposes of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 31 August 2012

For and on behalf of
Taranaki Regional Council

_____

Director-Resource Management

Consent 1213-2

TARANAKI REGIONAL COUNCIL
CHIEF EXECUTIVE
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Please quote our file number on all correspondence

Water Permit

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

Name of Consent Holder: Ballance Agri-Nutrients Limited
P O Box 439
HAWERA 4640

Change To Conditions Date: 12 November 2007 [Granted: 23 September 1991]

Conditions of Consent

Consent Granted: To take water from the Kapuni Stream to supply an ammonia/urea plant at Palmer Road, Kapuni during emergencies when the normal supply from the Waingongoro River has failed at or about 2611535E-6192552N

Expiry Date: 1 June 2011

Review Date(s): June 1993, June 1999

Site Location: Palmer Road, Kapuni

Legal Description: Site of use: Pt Lot 1 DP 13121
Site of take: Lot 2 DP 10570 Blk XVI Kaupokonui SD

Catchment: Kapuni

For General, Standard and Special conditions pertaining to this consent please see reverse side of this document
www.trc.govt.nz

General conditions

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

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

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

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

Special conditions

Condition 1 – previous condition deleted and replaced

1. The rate of taking shall not exceed 33 litres per second.

Condition 2 – new

2. The consent holder shall reinstate the normal water supply as soon as is practically achievable.

Condition 3 – previous condition 2 deleted and replaced

3. Each time the consent is exercised the consent holder shall immediately advise the Chief Executive, Taranaki Regional Council, and within five days provide a written report. The report shall detail how the normal supply failed and the work programme proposed to reinstate it as soon as is practically achievable. If the time taken to reinstate the normal supply is longer than five days the consent holder shall provide progress reports in a form and at a frequency as may be directed by the Chief Executive, Taranaki Regional Council.

Condition 4 - previous condition 3 modified

4. That the consent holder shall install and maintain a flow meter, to the satisfaction of the Chief Executive, Taranaki Regional Council, the meter shall record flow rates during operation of the system [litres/second] and total water volume abstracted [cumulative cubic metres] during exercise of this consent.

Signed at Stratford on 12 November 2007

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	Ballance Agri-Nutrients (Kapuni) Limited P O Box 439 HAWERA 4640
Decision Date:	31 August 2012
Commencement Date:	31 August 2012

Conditions of Consent

Consent Granted:	To discharge treated plant production effluent and contaminated stormwater from an Ammonia/Urea plant into the Kapuni Stream when wet ground conditions do not allow spray irrigation onto and into land at or about (NZTM) 1700851E-5629366N
Expiry Date:	1 June 2035
Review Date(s):	June 2017, June 2023, June 2029
Site Location:	309 Palmer Road, Kapuni
Legal Description:	Lot 1 DP 15254 (Discharge site)
Catchment:	Kapuni

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 may be exercised only when the effluent cannot be immediately assimilated into the soil and on-site effluent storage is nearing full capacity.

2. The discharge shall not exceed 1000 cubic metres per day.

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

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

Constituent	Standard
pH	Within the range 6.5 to 9.0
Zinc	Concentration not greater than 1.5 gm^{-3}

5. Beyond a mixing zone of 200 metres downstream from the discharge point, the discharge shall not cause constituents in the Kapuni Stream to exceed the maximum concentrations shown in the table below.

Constituent	Maximum concentration
Un-ionised ammonia	0.025 gm^{-3}
Nitrite	0.2 gm^{-3}

6. After allowing for reasonable mixing, within a mixing zone extending 200 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.

7. Subject to the other conditions this consent, this consent shall be exercised in accordance with an 'Effluent Disposal Management Plan' (the 'Management Plan') that has been approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The Management Plan shall detail methods and procedures undertaken by the consent holder to ensure that the conditions of this consent are met and can be shown to be met, including but necessarily limited to details of:

   (a) conditions under which this consent may be exercised;
   (b) how compliance with condition 2 is determined;
   (c) notification to the Taranaki Regional Council about the exercising of this consent;
   (d) monitoring of the discharge;
   (e) monitoring of the Kapuni Stream; and
   (f) reporting on exercise of consent.

   Note: The Management Plan required by this condition may be combined with Management Plans required by the conditions of other consents held by the consent holder for the site.

8. Within 3 months of this consent being issued, the Management Plan required by condition 7 shall be submitted by the consent holder to the Taranaki Regional Council for certification by the Chief Executive.

9. A copy of any reviewed Management Plan, in accordance with conditions 7 and 8, shall be provided to the Department of Conservation and Fish and Game New Zealand (Taranaki Region), for the Taranaki Regional Council to take into account any comments received (within a two week timeframe from when the Plan was provided).

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2017 and/or June 2023 and/or June 2029 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 31 August 2012

For and on behalf of
Taranaki Regional Council

_____

Director-Resource Management

Consent 1766-2

TARANAKI REGIONAL COUNCIL

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Discharge Permit

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

Name of Consent Holder:	Ballance Agri-Nutrients Kapuni Limited P O Box 439 HAWERA
Change To Conditions Date:	30 November 1995 [Granted: 23 September 1991]

Conditions of Consent

Consent Granted:	Discharge up to 1,000 cubic metres/day of treated plant production effluent and contaminated stormwater from an Ammonia/Urea plant to the Kapuni Stream when conditions do not allow spray irrigation onto land at or about GR: Q20:109-912
Expiry Date:	1 June 2011
Review Date(s):	June 1993, June 1999, June 2005
Site Location:	Ammonia-Urea Plant, Palmer Road, Kapuni
Legal Description:	Lot 1 DP 15254 Pt Sec 11 Blk XVI Kaupokonui SD
Catchment:	Kapuni

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

General conditions

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

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

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

(i) the administration, monitoring and supervision of this consent;
(ii) charges for the carrying out of the Council's functions under section 35 in relation to this consent; and
(iii) charges authorised by regulations.

Special Conditions

1. That the conditions of this right shall be subject to review on 1 June 1993, 1 June 1999 and 1 June 2005.

2. That this right may be exercised only or immediately following a time when heavy rainfall at the plant site does not allow the spray irrigation of effluent onto land.

3. That components of the discharge shall not exceed the following concentrations:

Discharge component	**Maximum concentration**
pH (range)	6.5 - 9.0
Zinc	1.5 gm^{-3}

4. That the discharge shall not cause the concentration of un-ionised ammonia in the Kapuni Stream to exceed 0.025 gm^{-3} outside of a mixing zone of 200 metres downstream from the discharge point.

5. That the discharge shall not cause the concentration of nitrite in the Kapuni Stream to exceed 0.2 gm^{-3} outside of a mixing zone of 200 metres downstream from the discharge point.

6. That the discharge shall not cause a significant detrimental effect to the freshwater ecological diversity of the Kapuni Stream Catchment.

7. That this right shall be exercised in accordance with the procedures of an effluent disposal management plan, to the written approval of the Taranaki Regional Council, which shall address the following matters:

(a) conditions under which this right may be exercised
(b) determination of maximum allowable discharge rate
(c) notification to the Taranaki Regional Council
(d) monitoring of the discharge
(e) monitoring of the Kapuni Stream
(f) reporting on exercise of right

8. That the effluent disposal management plan described in special condition 7 of this right shall be submitted to the Chief Executive, Taranaki Regional Council, before 1 December 1991 for approval, and thereafter shall be subject to review upon three months' notice by either the Grantee or the Taranaki Regional Council.

Transferred at Stratford on 5 July 2001

For and on behalf of
Taranaki Regional Council

Chief Executive

TARANAKI REGIONAL COUNCIL
CHIEF EXECUTIVE
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Please quote our file number on all correspondence

Discharge Permit

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

Name of Consent Holder:	Ballance Agri-Nutrients [Kapuni] Limited P O Box 439 HAWERA 4640
Decision Date:	10 February 2012
Commencement Date:	10 February 2012

Conditions of Consent

Consent Granted:	To discharge emissions into the air from the manufacture of ammonia and urea and associated activities at an ammonia-urea manufacturing complex at or about (NZTM) 1700202E-5629703N
Expiry Date:	1 June 2035
Review Date(s):	June 2017, June 2022, June 2027, June 2032
Site Location:	309 Palmer Road, Kapuni
Legal Description:	Lot 20 Blk XV Kaupokonui SD (Discharge source & site)

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

General condition

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

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effects on the environment arising from discharges to air from the site. The best practicable option includes, but is not limited to:

    - the consent holder at all times operating, maintaining, supervising, monitoring and controlling all processes so that emissions authorised by this consent are maintained at a practicable minimum;
    - urea being handled in such a manner and process and conveying equipment so contained to minimise spillages outside processing, storage and packaging/dispatch buildings or areas, and to prevent transport of dust beyond the boundary of the site;
    - the storage of anhydrous ammonia being undertaken in such a manner that maximum protection is afforded to valves, pipes and other fittings to minimise risk of accidental damage; and
    - the probability of ammonia pressure safety valve [PSV] system discharges being reduced as far as practicable, to ensure that any discharge does not pose a significant risk to people living or working in the area nor to farm livestock.

2. Prior to undertaking any alterations to the plant, processes or operations which may significantly change the nature or quantity of contaminants discharged to air from the site, the consent holder shall consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals required under the Resource Management Act 1991.

3. The combined emission of ammonia [as NH3] from the following sources shall not exceed 295 kg/hour:

    a) dust scrubber fan D4-GB-1505; and
    b) blow down tank vent D5-FA-403.

4. The emission of ammonia to the atmosphere under normal operation, start-up and shut-down shall be so controlled to ensure that the maximum ground level concentrations [one-hour average] do not exceed 4.27ppm (v/v) beyond the boundary of the site.

5. Within 12 months of the issue of this consent, the consent holder shall to the satisfaction of the Chief Executive, Taranaki Regional Council, establish two static monitoring locations beyond the boundary of the site for the purpose of monitoring atmospheric ammonia on adjacent property, and to check compliance with condition 4. The consent holder shall record the ground level concentration of ammonia at the static monitoring locations, every Wednesday morning between 7.00 am and 10.00 am, or at an alternative time as agreed to by the Chief Executive, Taranaki Regional Council.

6. The emission of urea shall not exceed:

   a) 125 $mgNm^{-3}$ [as urea] or 12 kg/hour [mass emission] from the dust scrubber fan D4-GB-1505; or

   b) 125 $mgNm^{-3}$ [as urea] from any other source.

7. The consent holder shall control all emissions of carbon monoxide and nitrogen dioxide to air so that the maximum ground level concentration of any of these contaminants, arising from the exercise of this consent, measured under ambient conditions does not exceed the relevant ambient air quality standard as set out in the Resource Management [National Environmental Standards for Air Quality Regulations, 2004] at or beyond the site boundary.

8. The consent holder shall control emissions of all contaminants to air, other than those expressly provided for in other special conditions of consent, so that they do not individually or in combination with other contaminants cause a hazardous, noxious, dangerous, offensive or objectionable effect at or beyond the boundary of the property.

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

   Note: For the purposes of this condition:

   - The boundary of the site is as illustrated on the map attached; and
   - Assessment under this condition shall be in accordance with the Good Practice Guide for Assessing and Managing Odour in New Zealand, Air Quality Report 36, Ministry for the Environment, 2003.

10. The consent holder shall provide to the Chief Executive, Taranaki Regional Council by 1 June 2012 and every three years thereafter, a written report which includes:

    a) a review of any technological advances in the reduction or mitigation of discharges to air from the site, and the costs and benefits of these advances; and
    b) an evaluation and review of ammonia pressure safety valve [PSV] systems, operating parameters, and vent heights to ensure that the probability of PSV discharges have been reduced as far as practicable, and to determine whether flaring or other control rather than vent height is practicable as a means to reduce ground level concentrations of ammonia; and
    c) details of any complaints received [external to the operation of the plant], to include date, time, operating conditions, weather conditions and measures taken in response; and
    d) monitoring records required by condition 5.

11. At least once every three years the consent holder shall convene a meeting with representatives of the Taranaki Regional Council and adjacent residential and industrial neighbours, to enable the dissemination and discussion of information relating to this consent.

12. The consent holder shall maintain a contingency plan for the site. 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.

13. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2017 and/or June 2022 and/or June 2027 and/or June 2032 for the purpose of ensuring that the ammonia standard specified in condition 4 is appropriate, and 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 10 February 2012

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Appendix 1

Map showing site boundary

Consent 4719-I

TARANAKI REGIONAL COUNCIL

PRIVATE BAG 713
47CLOTEN ROAD
STRATFORD
NEWZEALAND
PHONE 0-6-765 7127
FAX 0-6-765 5097

Water Permit

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

Name of Consent Holder:	Ballance Agri-Nutrients Kapuni Limited P 0 Box 439 HAWERA
Change To Conditions Date:	8 September 1995 [Granted: 27 January 1995]

Conditions of Consent

Consent Granted:	To take up to 200 cubic metres/day [8.8 litres/second] of water from a series of groundwater bores at the ammonia-urea plant site at Kapuni in the Kapuni Catchment for industrial site remediation purposes and process use at or about GR: Q20:103-912
Expiry Date:	1 June 2011
Review Date(s):	June 1999, June 2005
Site Location:	Ammonia Urea Plant, Palmer Road, Kapuni
Legal Description:	Pt Sec 19 & Lot 20 Blk XV Kaupokonui SD
Catchment:	Kapuni

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

General conditions

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

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

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

(i) the administration, monitoring and supervision of this consent;
(ii) charges for the carrying out of the Council's functions under section 35 in relation to this consent; and
(iii) charges authorised by regulations.

Special conditions

1. That the consent holder shall inform the Taranaki Regional Council prior to commencing abstraction from any new groundwater bore or bores.

2. That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 1999 and/or June 2005, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the abstraction on the environment.

Transferred at Stratford on 5 July 2001

For and on behalf of
Taranaki Regional Council

Water Permit

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

Name of Consent Holder:	Ballance Agri-Nutrients (Kapuni) Limited P O Box 439 HAWERA 4640
Decision Date:	31 August 2012
Commencement Date:	31 August 2012

Conditions of Consent

Consent Granted:	To take and use groundwater from the Kapuni Stream for industrial site remediation and process use purposes at or about (NZTM) 1700277E-5629526N
Expiry Date:	1 June 2035
Review Date(s):	June 2017, June 2023, June 2029
Site Location:	309 Palmer Road, Kapuni
Legal Description:	Lot 1 DP 13121 (Site of take & use)
Catchment:	Kapuni

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

General condition

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

Special conditions

1. The volume of water taken shall not exceed 200 m^3 per day.

2. The consent holder shall maintain a record of the abstraction including date, rate, pumping hours and daily volume abstracted and supply these records to the Chief Executive, Taranaki Regional Council, no later than 31 July of each year, or earlier upon request.

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

4. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2017 and/or June 2023 and/or June 2029 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 31 August 2012

For and on behalf of
Taranaki Regional Council

_____

Director-Resource Management

TARANAKI REGIONAL COUNCIL

CHIEF EXECUTIVE
PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE: 06-765 7127
FAX: 06-765 5097
www.trc.govt.nz

Please quote our file number on all correspondence

Certificate of Compliance

Pursuant to section 139 of the Resource Management Act 1991 a certificate of compliance is hereby issued by the Taranaki Regional Council

Name of certificate holder

Ballance Agri-Nutrients (Kapuni) Limited
P O Box 439
HAWERA 4640

Site location

309 Palmer Road at or about GR: 1700250E-5629534N [legal description: Pt Lot 1 DP 13121 [Discharge source & site]]

Proposal/Activity

To discharge treated domestic wastewater into land via soakage trenches in the Kapuni catchment

Certification

The Taranaki Regional Council hereby certifies that:

the discharge of treated domestic wastewater into land via soakage trenches in the Kapuni catchment as outlined in the documentation supplied in support of the application is a permitted activity pursuant to Rule 22 of the Regional Freshwater Plan for Taranaki [2001] at the date of receipt of the application for this certificate, provided that it complies with and continues to comply with the following conditions:

- *The discharge shall not result in surface ponding or runoff of any contaminant into a surface water body;*
- *There shall be no direct discharge of any contaminant into a surface water body;*
- *The discharge shall not be within 25 metres of a surface water body;*
- *The discharge shall not be within 50 metres of any bore, well or spring used for water supply purposes;*

- *The discharge shall not be noxious, dangerous, offensive or objectionable to such an extent that it has or is likely to have a significant adverse effect on the environment.*

Any discharge which causes any of the above conditions to be breached is not permitted and may be the subject of enforcement action.

Signed at Stratford on 6 December 2010

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Appendix II

Technical review report prepared by Ballance Agri-Nutrients under special condition 10 of air discharge permit 4046-3

Ref: TM12-072

Ballance Agri-Nutrients [Kapuni] Limited

A Report Prepared for Special Conditions 5 and 10 of

Air Discharge Permit 4046-3

February 2012 – May 2012

Contents Page

1.0 INTRODUCTION

Ballance Agri-Nutrients [Kapuni] Limited (*Ballance-Kapuni*) holds Discharge Permit 4046-3, issued by the Taranaki Regional Council for the following purpose:

> *To discharge emissions into the air from the manufacture of ammonia and urea and associated activities at an ammonia-urea manufacturing complex at or about GR: Q20: 104-918.*

There are 13 special conditions associated with the discharge permit detailing various limits and/or management practices to be adhered to.

This report is specifically prepared to meet the requirements of special conditions 5 and 10, as follows:

Special Condition 10

> *The consent holder shall provide to the Chief Executive, Taranaki Regional Council, by 1 June 2012 and every three years thereafter a written report which includes:*
> a) *A review of any technological advances in the reduction or mitigation of discharges to air from the site, and the costs and benefits of these advances; and*
> b) *An evaluation and review of ammonia pressure safety valve [PSV] systems, operating parameters, and vent heights to ensure that the probability of PSV discharges have been reduced as far as practicable, and to determine whether flaring or other control rather than vent height is practicable as a means to reduce ground level concentrations of ammonia; and*
> c) *Details of any complaints received [external to the operation of the plant], to include date, time, operating conditions, weather conditions and measures taken in response; and*
> d) *Monitoring records required by condition 5.*

Special Condition 5

> e) *Within 12 months of the issue of this consent, the consent holder shall to the satisfaction of the Chief Executive, Taranaki Regional Council, establish two static monitoring locations beyond the boundary of the site for the purpose of monitoring atmospheric ammonia on adjacent property, and to check compliance with condition 4. The consent holder shall record the ground level concentration of ammonia at the static monitoring locations, every Wednesday morning between 7.00 am and 10.00 am, or at an alternative time as agreed by the Chief Executive, Taranaki Regional Council*

Special Condition 4

> *The emission of ammonia to atmosphere under normal operation, start up and shut down shall be so controlled to ensure that the maximum ground level concentrations [one-hour average] do not exceed 4.27 ppm (v/v) beyond the boundary of the site.*

This is the first review and is for the period February 2012 to May 2012.

2.0 OVERVIEW

The Ballance-Kapuni ammonia-urea plant is owned and operated by Ballance Agri-Nutrients Limited. An overview of the process is provided in Appendix 1, but essentially gas, water (steam) and electricity are used in the production of ammonia and then urea with products sold for further industrial or agricultural use domestically.

3.0 CONDITION 10(a): TECHNOLOGICAL ADVANCES TO REDUCE EMISSIONS

3.1 Recent improvements

The two major sources of ammonia air emissions are from the dust scrubber and from the main vent. The ammonia in the dust scrubber is mainly comprised of residual un-reacted ammonia from the urea process and is present during normal operation. Ammonia generally enters the main vent during plant start up and shut down. Many of the urea plant safety valves discharge into the main vent also.

A considerable amount of work has been carried out to ascertain the improvements required to minimise residual un-reacted ammonia entering the dust scrubber. As a result, a number of improvement projects were identified and, subsequently, implemented during the turnaround in early 2012. These improvements range from valve and pipe work upgrades to the installation of new cooling capabilities within the urea plant. The total cost of these projects will approach $2M.

A new ammonia analyser has been added to the main vent, at a cost of over $200k. This allows early detection of ammonia passing into the vent during start up and shut down, and from planned or unplanned venting activities. The early warning given by the analyser allows corrective actions to be taken promptly, to minimise ammonia releases to atmosphere.

3.2 Technology advances

Conceptual design work, including discussions with technology providers, has been undertaken to identify how the ammonia emissions from the dust scrubber can be reduced substantially. This work will be progressed later in 2012 when detailed design and costing of the proposals will be carried out.

4.0 CONDITION 10(b): PRESSURE SAFETY VALVES AND VENT HEIGHTS

4.1 Ammonia pressure safety valves

There are 252 pressure safety valves on the ammonia plant and 118 pressure safety valves on the urea plant, giving a total of 370.

A programme of work has been underway for the past two years evaluating and reviewing all of the pressure safety valves on site, but with particular emphasis on the safety valves in the (high pressure) ammonia loop area of the plant. Given the number of safety valves on the plant, it will take some time to complete this work.

This work comprised:

a) Developing a single master list of all pressure safety valves on the plant
b) Matching the details on this list to actual valves on plant, engineering drawings and plant operating parameters
c) Prioritising the criticality of these safety valves, based on service conditions
d) Carrying out relief case calculations to confirm that sizing of the valves and associated pipe work complied with current codes.
e) Carrying out valve and/or pipe work modifications, as required.

The work described above has focused on those pressure safety valves in critical, high pressure, services. Most of these critical valves have the capacity to release ammonia to atmosphere should they lift and this work is part of the process safety mitigation work aimed at minimising the number of safety lifts that occur.

4.2 Vent heights, flaring or other options

There are almost 100 vent points on the plant, many involving the release of small amounts of ammonia as part of normal day-to-day operation. As described above, many of the urea plant safety valves discharge into the main vent, which is the highest vent point on the plant (36m high). Many of the ammonia plant pressure safety valves discharge directly to atmosphere, local to the safety valve and relatively close to grade.

The costs and benefits of installing a flare system on site have not been worked up in detail. However, it has been recognised that mitigating the release of ammonia when safety valves lift would be beneficial. It is intended that a detailed study be carried out to identify cost-beneficial alternatives to direct venting to atmosphere. This will is planned to commence within the next 12 months.

5.0 CONDITION 10(c): EXTERNAL COMPLAINTS

The table below summarises the details of all external complaints received during the period. None of these external complaints were consent breaches.

Date	Time	Operating conditions	Weather conditions	Response measures	Comments
30th April 2012	15:30	Normal	Westerly 3-5 knots	Drains flushed, pit pump cleared	Boundary measurement was 0.53 ppm
15th May 2012 - STOS	12:50	Normal	Westerly 15-20 knots	Normal plant checks – PFP scrubber diluted as a precaution	Boundary measurement was 0.33 ppm
17th May 2012	12:40	Normal	Westerly 5 knots	Normal plant checks – nothing found	Boundary measurement was 0.65 ppm
18th May 2012 - STOS	0815	Normal	Westerly 10-15 knots	Normal plant checks – nothing found	Boundary measurement was <0.2 ppm
25th May 2012 - STOS	1322	Normal	South Westerly 5 knots	Normal plant checks – nothing found	Boundary measurement was <0.52 ppm

6.0 CONDITION 10(d): Monitoring records required by Condition 5

Discussions with our residential neighbours were initiated with the aim of identifying suitable locations for the static monitoring sites. When these have been confirmed the monitoring programme will be initiated. Confirmation of the two sites is expected shortly. Consequently, at this time, there is no monitoring data to report.

Additional supplies of monitoring equipment have been ordered to accommodate the planned increase in requirements.

7.0 NEIGHBOURS

Ballance-Kapuni continues to operate the Mutual Aid Agreement, which provides assistance to all three plants at Kapuni. The nearest neighbours are contacted frequently to discuss any concerns, particularly if we are starting up/shutting down or performing a non-routine activity. On an annual basis all residential neighbours are invited to site to receive an update on Ballance-Kapuni activities from the previous year and plans for the next year. This is also an opportunity to discuss any issues collectively that they wish to raise.

8.0 SUMMARY

Dust scrubber ammonia emission results have stayed roughly constant over the past three years. Work is ongoing to reduce urea emissions, which have trended upwards over the past three years.

Ballance-Kapuni will continually look to improve and optimise the plant process and capacity.

Ballance-Kapuni is committed to demonstrate a good level of environmental performance and compliance in regard to its air discharge permit (resource consent).

Ballance-Kapuni values its opportunity to operate in the Taranaki region and will continue to explore other options to reduce the impact its activities have on the environment.

Appendix 1

Ammonia production

Pre-heated and desulphurised natural gas is reacted with steam in the primary reformer. This is a gas-fired furnace containing vertical, catalyst-filled tubes through which the reacting mixture passes to produce carbon monoxide, carbon dioxide and hydrogen. A controlled quantity of air is then added to this mixture in the secondary reformer to produce synthesis gas containing the correct hydrogen to nitrogen ratio. The gas then passes to the shift converters, where carbon monoxide is converted to carbon dioxide. This is subsequently removed in an absorber-stripper unit to provide one of the feedstocks of the urea plant.

After removal of the last traces of carbon oxides in the methanator, this synthesis gas is compressed by two 3700kW- and one 4800kW- Cooper Bessemer Compressors, operating in parallel (which also provide compressed air and ammonia refrigeration compression for the plant). The compressed process gases, consisting mainly of nitrogen and hydrogen, are fed into the ammonia loop and pass through the ammonia synthesis converter. The gases are then refrigerated and ammonia condensed to be drawn off from the circulation synthesis gas as a liquid. This product is over 99.5% pure and is stored as a liquid in three tanks with a combined capacity of 450 tonnes.

Urea production

Anhydrous liquid ammonia from storage is combined with carbon dioxide (separated from the ammonia synthesis gas) in the urea synthesis reactor.

The resulting product is a mixture of urea, water and an intermediate by-product, ammonium carbamate, which is separated from the aqueous urea in a three-stage decomposition and absorption process. This purification section produces a liquid stream which is recycled to a second urea reactor. Aqueous urea is concentrated by evaporating water from the molten solution, which is then granulated in a mixed fluid-spouting bed granulator.

The granular urea is then conveyed to the bulk store ready for distribution to users. The bulk storage facility at Kapuni is capable of holding 10,000 tonnes of product.

Ballance's n-rich urea contains:

- 46% nitrogen
- 20% carbon
- 27% oxygen
- 7% hydrogen

Using urea

Urea is used extensively throughout the New Zealand agricultural sector. With a nitrogen concentration of 46%, and hard, free-flowing qualities, urea is the most cost-efficient source of nitrogen available to farmers.

Urea can be purchased in bagged or bulk form, and spread by hand, tractor- or bike-mounted spreaders, or by commercial spreaders. Used strategically, it offers enormous benefit to farmers, helping to promote plant growth to provide feed for animals or higher crop yields.

Urea is also used by New Zealand's industrial sector, particularly in the manufacture of urea formaldehyde resin (adhesive). This is then used for making plywood, particle board, abrasive papers and fibreboards, many of which are exported. Other industrial uses for urea include the manufacture of fibreglass, yeast making, in livestock feeds, in the pharmaceutical industry, and in the manufacture of cosmetics, cleaners and paint.

Ammonia

A small percentage of ammonia manufactured is sold annually on the domestic market to meet New Zealand's requirements for anhydrous ammonia. This is used primarily in refrigeration systems, with smaller amounts required for the manufacture of detergents and the treatment of industrial effluent.

The environment

The ammonia and urea complex is operated in accordance with stringent safety and environmental standards. The urea manufacturing process uses and produces water. Much of this effluent is recycled with the balance stored, treated and spray irrigated onto pastures surrounding the complex.

Continuous review and analysis is done to determine the optimum use of waste streams, thus trying to minimise the impact on the environment. This is verified with in-house and independent third party review.