DH Lepper Trust Piggery Monitoring Programme Annual Report 2013-2014

Technical Report 2014–28

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Executive summary

DH Lepper Trust operates a piggery located on Mountain and Manutahi Roads, in the Waiongana catchment. This report for the period July 2013-June 2014 describes the monitoring programme implemented by the Taranaki Regional Council to assess the Company's environmental performance during the period under review, and the results and environmental effects of the Company's activities.

During the monitoring period, the Company demonstrated an overall high level of environmental performance and compliance with the resource consents.

The Company holds a total of three resource consents, which include a total of 24 conditions setting out the requirements that the Company must satisfy.

The Council's monitoring programme for the year under review included four inspections and three physicochemical water quality sampling surveys.

Consent 0715-3 expired December 2013 with no further reviews of this consent being provided for. As a result, the renewal application has been modified to include a dual system for the disposal of treated piggery effluent on site.

Consent 5206-2 (discharge to air) is subject to change. A variation to the existing consent is required because this consent did not anticipate the additional effects associated with discharging treated effluent to land, as at July 2014.

The monitoring showed that the consent holder has ensured that consented receiving water dilution ratios were well maintained throughout limited discharge periods. The consent holder has supplied the Council with effluent discharge records which indicate wastewater was discharged only when the flow in the Waiongana Stream was greater than 5 cubic metres per second.

Throughout the 2013-2014 monitoring period the consent holder continued to utilise extracted biogas from the covered anaerobic pond for onsite energy requirements.

During the year, the Company demonstrated both a high level of environmental and administrative performance and compliance with the resource consents. Minor issues were identified under marginal stream flow conditions (near 5 m^3/sec) necessitating refinements to the management (timing and duration) of discharges during such flow conditions.

No incidents associated with DH Lepper Trust Piggery were recorded by Council.

This report includes recommendations for the monitoring programme for the 2014-2015 year,

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1. Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is the Annual Report for the period July 2013-June 2014 by the Taranaki Regional Council on the monitoring programme associated with resource consents held by DH Lepper Trust. The Company operates a piggery situated on Mountain Road (SH3a) at Lepperton, in the Waiongana catchment.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by the DH Lepper Trust that relate to a discharge of water within the Waiongana catchment, and the air discharge permit held by DH Lepper Trust 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 11th combined annual report by the Taranaki Regional Council for the Company.

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 DH Lepper Trust in the Waiongana catchment, the nature of the monitoring programme in place for the period under review, and a description of the activities and operations conducted by the Company.

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 (eg, recreational, cultural, or aesthetic);
(e) risks to the neighbourhood or environment.

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

1.1.4 Evaluation of environmental and consent performance

Besides discussing the various details of the performance and extent of compliance by the consent holder/s during the period under review, this report also assigns a rating as to each Company's environmental and administrative performance.

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

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

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

Environmental Performance

- **High** No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment .The Council did not record any verified unauthorised incidents involving

significant environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

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

  For example:

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

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

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

Administrative compliance

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

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

- **Improvement required** Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the

period under review. The Council may have issued an abatement notice to attain compliance.

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

For reference, in the 2013-2014 year, 60% 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 29% demonstrated a good level of environmental performance and compliance with their consents.

1.2 Process description

The consent holder operates a 'farrow to finish' piggery breeding and fattening unit. The approximate weights of the pigs are shown in Table 1 below.

The pigs are housed in purpose-built sheds (Figure 1) with controlled heating and ventilation systems that regulate the internal environment to optimise conditions for stock production.

A feed mill located on site mixes the majority of the piggery's food requirements with grains and feed supplements. Recycled local waste food supplies, including waste bread from local suppliers, are mixed to produce a protein meal for the stock.

Table 1 Piggery composition as at 15 June 2014

Type of pigs	No of pigs	Average weight	Total weight	50 kg Equivalent pigs
Sows	434	162	70,280	1,406
Light porkers (3 months)	1,026	65	66,690	1,334
Store pigs (2½ months)	325	44	14,300	286
Weaners (5 – 8 weeks)	1,351	18	25,150	503
Total	3,136			3,529

Stock holding pens are washed down on a daily basis and the waste conveyed through pipes to a central collection tank. From this point, all waste material is channelled through a solids separator (contra shear screen) which provides primary treatment by separating out the solid component from the piggery slurry.

Solid waste is stored in three large bins prior to being mixed 1:1 with sawdust. The mixture is then transferred to a large covered compost bunker where it is aerated until well composted. The composting process elevates the temperature which kills harmful pathogens as well as helping to stabilise the product. The forced aeration provides oxygen for bacterial action. The final product is bagged and sold commercially as a soil conditioner.

After solids have been removed, the piggery wastewater drains to a liquids sump and pumped to the inlet of the covered anaerobic pond.

Biogas is produced from the covered anaerobic pond digestive process and captured and stored beneath the plastic cover on the anaerobic pond. The biogas (approximately 200 m^3 of gas daily) is compressed and forced through a hydrogen sulphide scrubber, powering a six-cylinder biogas engine that drives a 40 kilowatt generator, which generates half of the piggery's electricity needs.

Partially digested effluent from the covered anaerobic pond is gravity-fed via a pipeline directly to the off-site treatment ponds, approximately 1.5 km away. The ponds are located on the true left bank of the Waiongana Stream near Lepperton.

Bacteria present in the two off-site treatment ponds break-down the contents of the effluent further. Periodically during high river flows, the consent holder discharges treated water from the final aerobic pond into the neighbouring Waiongana Stream in compliance with the conditions of Consent **0715.**

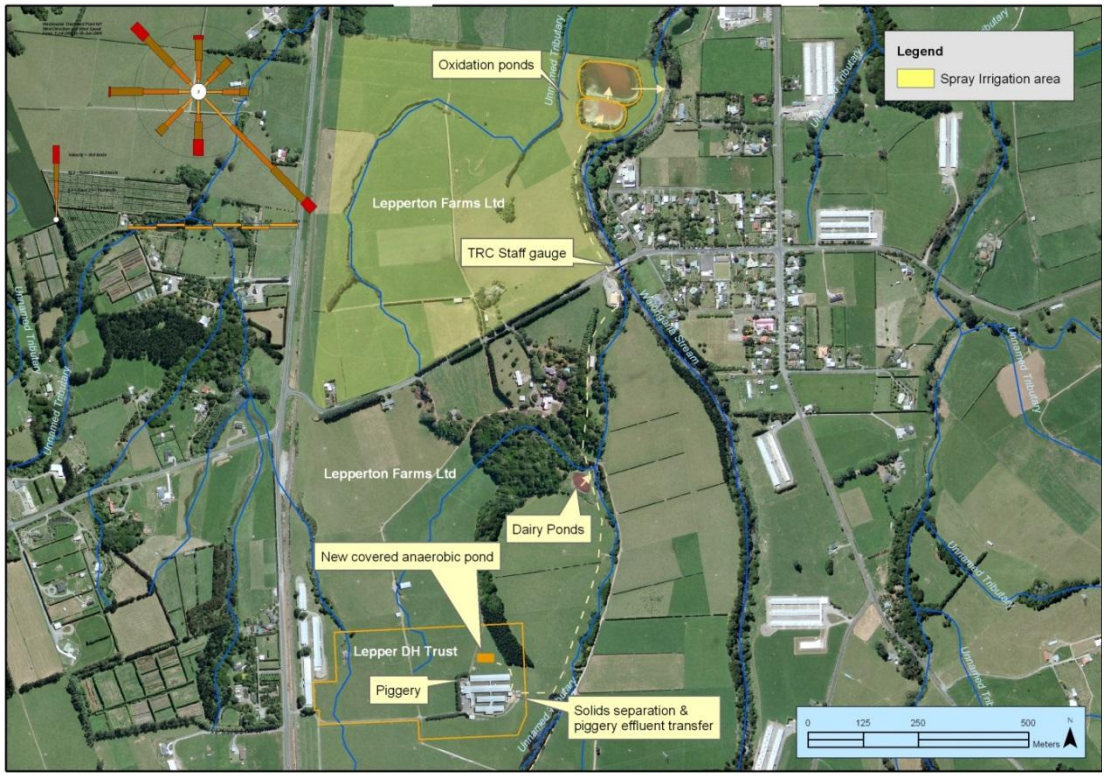

Figure 1 Location of DH Lepper Trust piggery and Lepperton

1.3 Resource consents

1.3.1 Water discharge permit

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations.

DH Lepper Trust holds water discharge permit **0715-3** to discharge treated piggery effluent from a treatment ponds system into the Waiongana Stream during fresh (high flow) conditions. This permit was issued by the Taranaki Regional Council on December 2002 as resource consent under Section 87(e) of the RMA. Consent **0713-3**

expired on 1 December 2013 with no further reviews of this consent being provided for. As a result, the renewal application has been modified to include a dual system for the disposal of treated piggery effluent on site. The proposal now includes the discharge of approximately 40 % of piggery effluent to land and the remaining 60 % will continue to discharge to water..

Partial transfer of Consent **0715-3** to separate the piggery and dairy effluent was made in accordance with sections 137(2) and (b)(i)or the RMA. These sections allow the transfer, or part transfer, of consents to another owner or occupier of the site. This part transfer of consent was completed during February 2011 with no change required to Consent **0715-3** special conditions. The transferred part of the consent (dairy discharge) is now under Consent **7775-1**, held by Lepper Farms.

The discharge of treated wastewater of this nature may affect the water quality of a stream, particularly if there is insufficient dilution. Some effects may be obvious (e.g. appearance, turbidity) while biological effects may be more subtle.

Eleven special conditions are included in Resource Consent **0715-3**:

Special condition 1 relates to the operation of the piggery and associated activities and discharges.

Special condition 2 defines the point of discharge.

Special condition 3 requires the maintenance of a minimum dilution rate of 1 part effluent to 250 parts receiving water at all times.

Special condition 4 defines a minimum flow in the Waiongana Stream above which the discharge may occur.

Special conditions 5 and 6 define the mixing zone and prohibit a number of effects.

Special condition 7 requires the consent holder to operate and maintain the treatment and discharge system to ensure compliance.

Special condition 8 requires the consent holder to monitor and maintain records of the discharge.

Special conditions 9 and 10 require effluent from the aerobic pond to be discharged onto and into land via irrigation at least once annually during the summer/autumn period and notification to be provided prior to any irrigation.

Special condition 11 provides for review of the consent.

The permit is attached to this report in Appendix I.

1.3.2 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.

DH Lepper Trust holds air discharge permit **5206-2** to discharge emissions into the air from a pig farming operation and associated practices, including solids composting, effluent treatment and other waste management activities. This permit was issued by the Taranaki Regional Council on 13 November 2008 as a resource consent under Section 87(e) of the Resource Management Act. It is due to expire on June 2026.

Consent **5206-2** is subject to change. A variation to the existing consent is required because this consent did not anticipate the additional effects associated with discharging approximately 40% of treated effluent to land, as at July 2014.

Ten special conditions are attached to the consent.

Special condition 1 requires the number of pigs [equivalent = 50kg per pig] on the property at any one time shall not exceed 3500 pig equivalents.

Special condition 2 requires the consent holder to adopt the best practicable option to prevent or minimise any actual or likely adverse effects.

Special condition 3 requires the new anaerobic pond to be covered and biogas utilised as an energy source.

Special condition 4 requires consultation should any alterations occur to the pig farming and effluent disposal processes, operations, equipment or layout which might change the nature or quantity of contaminants emitted from the site.

Special condition 5 requires the consent holder to minimise the emissions and impacts of air contaminants discharged into air from the site.

Special condition 6 restricts odours at or beyond the boundary of the site.

Special condition 7 allows intermittent offensive and objectionable odour, beyond the property boundary for a limited period while anaerobic to aerobic pond conditions settle.

Special condition 8 outlines the recording and reporting of odour emissions which may be deemed offensive or objectionable.

Special condition 9 requires an Odour Management Plan outlining how odorous emissions beyond the boundary are minimised.

Special condition 10 provides for review of any or all of the conditions of the consent.

The permit is attached to this report in Appendix I.

1.3.3 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.

DH Lepper Trust holds Consent **0188-3** to cover the take of water from an unnamed tributary of the Waiongana Stream for piggery operation purposes.

This permit was re-issued by the Council on 09 January 2002 under Section 87(d) of the RMA. It is due to expire on 1 June 2020.

Three special conditions are attached to this consent.

Special condition 1 requires consent holder to adopt best practicable option to prevent or minimise effects.

Special condition 2 states the abstraction should not exceed 50% of the natural stream flow and special condition 3 is a review provision.

The permit is attached to this report in Appendix I.

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the RMA sets out obligation/s 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 upon these. The Taranaki Regional Council may therefore make and record measurements of physical and chemical parameters, take samples for analysis, carry out surveys and inspections, conduct investigations, and seek information from consent holders.

The monitoring programme for the DH Lepper site consisted of three primary components.

1.4.2 Programme liaison and management

There is generally a significant investment of time and resources by the Taranaki Regional Council in ongoing liaison with resource consent holders over consent conditions and their interpretation and application. This involves discussion over monitoring requirements, preparation for any reviews, renewals, or new consents, advice on the Council's environmental management strategies and the content of regional plans, and consultation on associated matters.

1.4.3 Site inspections

The piggery was visited four times during the monitoring period. With regard to consents for the discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. Air inspections focused on plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions. Sources of data being collected by the 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 as part of the monitoring inspection.

1.4.4 Chemical sampling

The Taranaki Regional Council undertook sampling of the discharges from the site and also the water quality of the Waiongana Stream upstream and downstream of the discharge point and consented mixing zone.

The piggery discharge from the site was sampled on three separate occasions, and the samples analysed for conductivity, chloride, turbidity, suspended solids, BOD_5 (total carbonaceous) and temperature. Additional sampling for nutrients (NPK) was also performed to assess further trends in wastewater quality for the purpose of the forthcoming discharge consent renewal process in relation to the discharge of effluent to land.

The Waiongana Stream, upstream and downstream of the discharge point was sampled on three occasions, and the samples analysed for conductivity, chloride, turbidity, suspended solids, BOD_5 (filtered carbonaceous), ammonia–N, DRP and temperature.

The location of the water sampling locations are illustrated in Figure 2. Water quality sampling is generally performed by starting at the upstream monitoring site (WGA000361), followed by the piggery wastewater discharge (PGP002002), then sampling at the downstream monitoring site (WGA000363).

The monitoring programme allows for the effluent discharge and receiving water to be sampled on three separate occasions, preferably during the summer, autumn, and spring periods.

2. Results

2.1 Water

2.1.1 Wastewater dilution establishment

The peak wastewater discharge flow from the aerobic pond has been calculated at 14 l/s (ref: Colebrock-White equation and chart).

Flow rates in the Waiongana Stream are recorded at the SH3a hydrological site. The consent holder has access to the Taranaki Regional Council web site (www.trc.govt.nz) which provides current river flow and water levels for the Waiongana Stream recorded at SH3a upstream of the pond discharge point. The information allows the consent holder to monitor and discharge during optimum river flow conditions in compliance with Special Consent condition 4.

The river level and flow data is automatically entered via the Council database. The data is tabulated every two hours and a graph is provided within ten minutes of downloading.

The consent holder also has available HydroTel text messaging and is notified when the Waiongana Stream flow has reached 5 m^3/s (minimum flow to allow discharge) and again when the stream flow has receded to this point.

The Waiongana Stream rise and fall is usually rapid, typical of all Taranaki mountain ring plain streams, and the actual opportunity for treated effluent to be discharged to the stream is limited.

2.1.2 Inspections

11 September 2013

This initial inspection for the 2013-2014 monitoring period was carried out during fine weather. A constant breeze was blowing at the time of inspection. Slight odours were noticed at various downwind sites. The first pond (covered anaerobic pond) had a large pocket of methane gas stored beneath the far end of the cover. The levelling tank (anaerobic pond discharge) level appeared normal with no apparent build up or partial blockage being observed. The wastewater collection area below the grunt (composting) area was well managed with all effluent streams from the first pond and the solids separator flowing directly to the bottom two oxidation ponds. Minimal odour was found to be emanating from around the composting area even after a load of compost was taken from off site at the time of inspection. The bottom two oxidation ponds appeared to be working well displaying light microbial activity. The ponds levels were relatively low allowing for further storage. The effluent treatment system was well managed and working satisfactory.

22 November 2013

A light south easterly breeze was blowing at the time of inspection. The first anaerobic pond had accumulated a large volume of gas beneath the pond cover. No odour was noticed around the pond perimeter. The solids separation area had a large quantity of mixed fertiliser stored and very little odour was emanating from this site. Piggery odour was found to be minimal at various downwind sites. Ken G Moratti Ltd Agricultural Contractor had pumped out the bottom anaerobic pond onto a

maize crop on Labour weekend (28 October 2013). All effluent waste streams were contained with no evidence of any recent overflows. Odour emanating around the piggery in general were found to be minimal. The system appeared to be working well and was well managed.

24 March 2014

A slight north easterly breeze was blowing at the time of inspection. Normal piggery odours were 'noticeable' at the downwind sites. No odour was detected at the first pond although slight odour was emanating from around the covered pond levelling tank. The solids separation area looked to be well managed with wastewater flowing into the lower sump. The bottom two oxidation ponds appeared to be working well with only a small discharge from pond 2 to the final pond. No odour was detected around these ponds. Overall the whole wastewater treatment system looked to be working satisfactorily and was well managed.

20 May 2014

This final inspection for the monitoring period was carried out during fine weather conditions - a very slight westerly breeze was blowing at the time of inspection. Slightly noticeable odour was detected at various sites around the piggery. No odour was detected from around the covered pond area although slightly noticeable odour was emanating from the sump. The pond levelling tank appeared to be working satisfactorily. The solids separation area was well maintained with only the main bin full and the other two bins were empty. All leached wastewater from around this area was flowing back into the downstream sump. Overall the piggery was found to be well managed. The bottom two ponds appeared to be well maintained with no odour being detected downwind of these ponds towards the boundary perimeter.

2.1.3 Results of discharge and receiving waters physicochemical monitoring

During the monitoring period, four inspections of the piggery site were conducted by Taranaki Regional Council staff. Samples were collected on three separate occasions from three sites as listed in Table 2 and illustrated in Figure 2, for physicochemical analysis in the Taranaki Regional Council IANZ registered laboratory.

Table 2 Location of sampling sites in the Waiongana Stream

Site	Location	Site code	GPS reference
Waiongana Stream	Approx 100 m u/s of discharge	WGA000361	N1704439 E5676128
Piggery pond treated effluent	final pond treated effluent	PGP002002	N1704469 E5676209
Waiongana Stream	50 m d/s of discharge – true left bank	WGA000363	N1704466 E5676274

Figure 2 Location of sampling sites

Survey of 23 September 2013

This initial receiving water monitoring survey was performed on 23 September 2013 after the consent holder had informed the Council that the piggery was discharging treated effluent to the Waiongana Stream. Samples were collected near the beginning of the discharge during overcast weather conditions after a period of heavy rain was recorded throughout the catchment. At the time of sampling the stream was running at a swift, moderately high (recession) flow with a stream flow of approximately 10 m^3/s (Figure 3). The river was turbid brown in colour. The wastewater discharge from the final anaerobic pond had no visual downstream environmental impact on the Waiongana Stream at the time of the survey. The consent holder continued to discharge for a further 6 hours before ceasing to discharge when the river flow had fallen to 7.8 m^3/s.

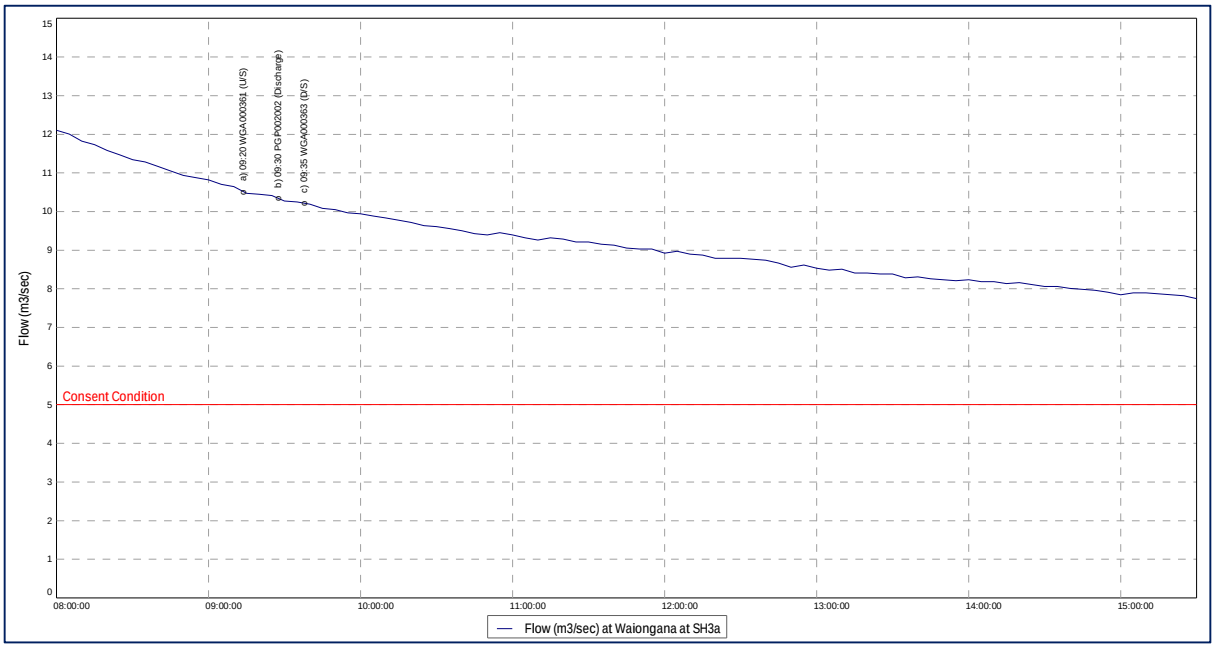

Figure 3 Flow data recorded for the Waiongana Stream for the duration of the piggery wastewater discharge commencing 23 September 2013 at 0800 hrs and finishing 23 September 2014 at 1530 hrs

Table 3 Results of the receiving water compliance survey of 23 September 2013

Site		WGA000361	PGP002002	WGA000363
Parameter	Unit	upstream	discharge	50 metres downstream
Time	NZST	0920	0930	0935
Temperature	°C	13.4	15.4	13.1
Conductivity @ 20°c	mSm	8.8	302	9.3
Chloride	g/m³	10.2	205	10.4
pH		7.6	8.1	7.7
BOD_5 (total)	g/m³	-	150	-
BOD_5 (carbonaceous filtered)	g/m³	<0.5	-	<0.5
Ammoniacal nitrogen	g/m³N	0.102	294	0.612
Un-ionised ammonia	g/m³N	0.0012	12.163	0.0087
Dissolved reactive phosphorus	g/m³P	0.029	-	0.094
Suspended solids	g/m³	12	310	14
Turbidity	NTU	7.8	160	7.9
Appearance		turbid brown	turbid dark green brown	turbid brown

These results indicate that the dilution rate was approximately 1 part effluent to 1000 parts receiving water and therefore was well in compliance with Special Condition 3 at the time of the survey and likely to have complied throughout the duration of the discharge. The increase of 0.51 g/m³N in ammoniacal nitrogen did not result in non-compliance with the un-ionised ammonia limit imposed by special Condition 5 at the time of survey. There was no measureable increase in filtered carbonaceous BOD_5 which remained well within the limit imposed by Special Condition 6, and otherwise the discharge had minimal impact in terms of pH, conductivity, and suspended solids at the mixing zone boundary.

Compliance with Special Condition 6(b) was indicated by the field observation that there was no change in the colour or visual clarity within the receiving waters at the boundary of the mixing zone.

The piggery pond wastewater quality sampled was slightly above past maximum levels for most parameters, (e.g. BOD_5, ammonia N, and suspended solids) that have been recorded since the dairy wastes were moved from the treatment system (Table 7) although well within the ranges found prior to this date.

Survey of 17 April 2014

This second receiving water monitoring survey was performed on 17 April 2014 after the consent holder had informed that the Council that the piggery was discharging treated effluent to the Waiongana Stream. Samples were collected during wet weather conditions after heavy overnight rain. The stream had a moderately swift flow which was recorded at approximately 9.6 m^3/s (Figure 4) which had peaked at 18 m^3/s some twenty-four hours previously. The river was slightly turbid green-brown in colour. The consent holder ceased discharging approximately thirteen hours after the samples had been collected, when the river flow had dropped to below 9.4 m^3/s.

The wastewater discharge from the final anaerobic pond showed no downstream environmental visual impact on the Waiongana Stream at the time of the sampling survey.

Note: Total nitrogen, total phosphorus and potassium piggery wastewater concentrations were also measured (Table 4) in order to assess the nutrient potential for future spray irrigation to land.

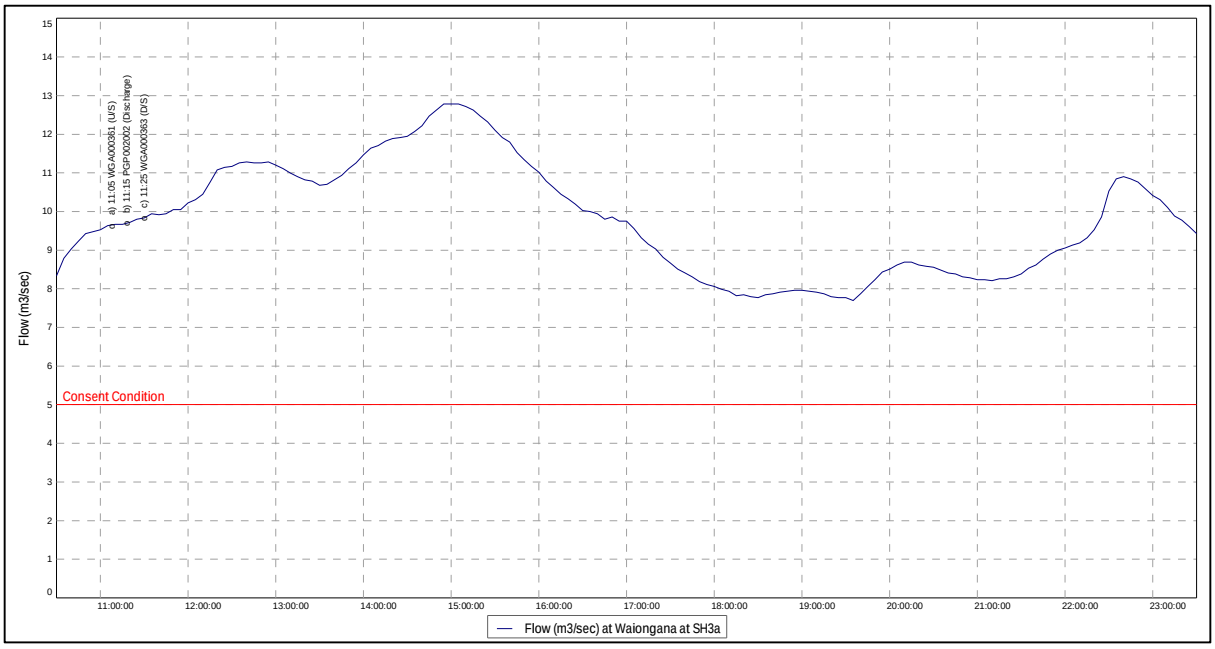

Figure 4 Flow data recorded for the Waiongana Stream for the duration of the piggery wastewater discharge commencing 17 April 2014 at 1030 hrs and finishing 17 April 2014 2013 at 2330 hrs

Table 4 Results of the receiving water compliance survey of 17 April 2014

Site		WGA000361	PGP002002	WGA000363
Parameter	Unit	upstream	discharge	50 metres downstream
Time	NZST	1105	1115	1125
Temperature	°C	14.6	16.1	14.6
Conductivity @ 20°c	mSm	10.5	223	11.2
Chloride	g/m³	11.0	364	12.2
pH		7.7	7.9	7.7
Potassium	g/m³	-	302	-
BOD_5 (total carbonaceous)	g/m³	-	76	-
BOD_5 (carbonaceous filtered)	g/m³	0.9	-	0.8
Ammoniacal nitrogen	g/m³N	0.268	98.5	0.661
Un-ionised ammonia	g/m³N	0.0043	-	0.0105
Total nitrogen	g/m³N	-	311	-
Total phosphorus	g/m³P	-	69.5	-
Dissolved reactive phosphate	g/m³P	0.072	-	0.287
Suspended solids	g/m³	16	240	19
Turbidity	NTU	8.7	130	10
Appearance		turbid, green-brown	turbid brown	turbid, green-brown

The results indicated that the dilution rate was approximately 1 part effluent to 295 parts receiving water and therefore in compliance with Special Condition 3 at the time of sampling and should have remained in compliance throughout the period of discharge, assuming a steady discharge rate. An increase of 0.39 g/m³N in ammoniacal nitrogen did not result in noncompliance with the un-ionised ammonia limit imposed by Special Condition 5. There was no measurable increase in filtered carbonaceous BOD_5 which remained within the limit imposed by Special Condition 6, and generally the discharge had minimal impact in terms of pH, conductivity, turbidity, and suspended solids at the mixing zone boundary. A visual assessment in the relation to Special Condition 6(b) compliance indicated there was no change in the colour or visual clarity within the receiving waters at the boundary of the mixing zone.

The piggery pond treated wastewater quality at the time of the survey was typical of that recorded since dairy wastes were removed from the treatment system (TRC 2013), with lower total BOD and ammonia N levels than previously recorded and turbidity and suspended solids level near historical medians.

Nitrogen (N), phosphorus (P) and potassium (K) values of the piggery wastewater have been included (Table 4) to assess the nutrient potential for spray irrigation to land in comparison with the discharge to the receiving waters of the Waiongana Stream.

Survey of 12 June 2014

This final receiving water monitoring survey was performed on 12 June 2014 following the Council requesting the consent holder to discharge treated effluent to the Waiongana Stream as flow conditions were very close to (but above) the Consent limit. This provided the Council with an opportunity to re-assess the dilution limit and reappraise the mixing characteristics under these stream flow conditions.

Samples were collected 1.25 hours after discharge commenced after a period of steady light rain during overcast conditions. At the time of sampling the stream was running at a swift, moderate flow, approximately 5.6 m^3/s, i.e. slightly above the consent limit of 5 m^3/s (Figure 5). The river was slightly turbid brown in colour. The consent holder discharged for a relatively short duration (five hours) ceasing the discharge when the stream flow had fallen to 5.4 m^3/s, as non compliance had been an issue at these stream flow levels in the past (TRC 2013). This was due to incomplete mixing at the designated boundary of the mixing zone.

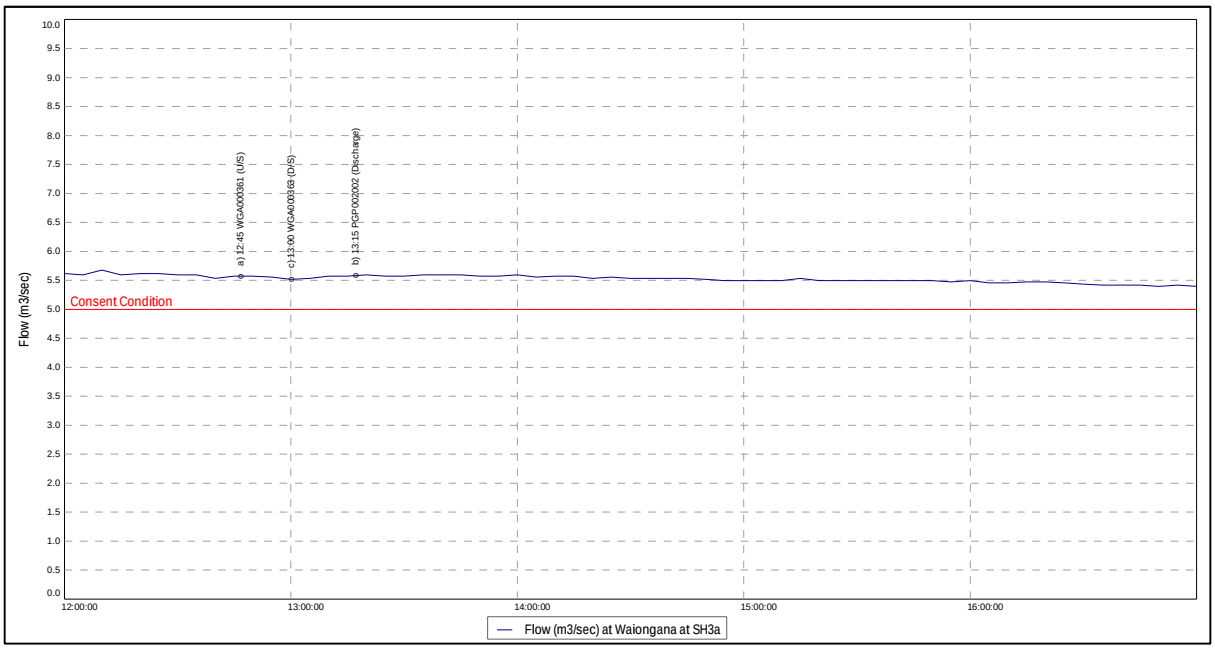

Figure 5 Flow data recorded for the Waiongana Stream for the duration of the piggery wastewater discharge commencing 12 June 2014 at 1200 hrs and finishing 12 June 2014 at 1700 hrs

Table 5 Results of the receiving water compliance survey of 12 June 2014

Site		WGA000361	PGP002002	WGA000363
Parameter	Unit	upstream	discharge	50 metres downstream
Time	NZST	1245	1315	1300
Temperature	°C	12.4	11.9	12.4
Conductivity @ 20°c	mSm	10.7	260	12.5
Chloride	g/m³	11.4	282	13.5
pH		7.9	8.0	7.9
Potassium	g/m³	-	240	-
BOD_5 (total carbonaceous)	g/m³	-	86	-
BOD_5 (carbonaceous filtered)	g/m³	<0.5	-	<0.5
Ammoniacal nitrogen	g/m³N	0.050	198	1.76
Un-ionised ammonia	g/m³N	0.0011	-	0.0374
Dissolved reactive phosphorus	g/m³P	0.026	-	0.305
Total nitrogen	g/m³ N	-	237	-
Suspended solids	g/m³	7	170	8
Total phosphorus	g/m³ P	-	55.6	-
Turbidity	NTU	5.1	120	5.8
Appearance		slightly turbid, brown	light turbid brown	slightly turbid, brown

These results indicated that during the assessment the dilution rate was approximately 1 part effluent to 130 parts receiving water and therefore not in compliance with Special Condition 3 at the time of the survey. It was also unlikely to have complied until the discharge ceased some four hours. The increase of 1.710 g/m³N in ammoniacal nitrogen resulted in non compliance with the un-ionised ammonia limit imposed by special Condition 5 despite the relatively low water temperature (12.4°C) and slightly alkaline pH (7.9) at the time of survey. There was no measurable increase in filtered carbonaceous BOD_5 which remained within the limit imposed by special Condition 6. The discharge had minimal impact in terms of pH, conductivity, turbidity, and suspended solids. A visual assessment of Special Condition 6(b) indicated there was no change in the colour or visual clarity of the receiving waters at the boundary of the mixing zone.

This assessment confirmed that inconsistent mixing occurs under marginal flow conditions. This study established that discharges should be initiated under higher stream flow conditions (above 5 m^3/s) or by manually reducing the discharge flow rate accordingly.

The treated piggery pond wastewater quality at the time of the survey was near or lower than ranges recorded since the dairy wastes were removed from the treatment system and therefore well below median values for the principal parameters.

Total nitrogen (TN), total phosphorus (TP) and potassium (K) data for the piggery wastewater were again collected (Table 5) to provide for the future evaluation of the nutrient potential for spray irrigating to land.

The results of this survey should now be utilised to refine the management regime for determining timing and duration of discharges to the Waiongana Stream for compliance purposes.

2.2 Historical wastewater trends

2.2.1 Evaluation of treatment pond system wastewater quality

Table 6 Summary of treated wastewater analysis results from the DH Lepper Trust piggery/dairy for the period 1991 to January 2011

Parameter	Unit	Number of samples	Range		Median
Conductivity @ 20°C	mS/m	16	222	415	289
pH		4	8.1	8.3	8.1
Total carbonaceous BOD5	g/m^3	16	110	310	170
Filtered carbonaceous BOD_5	g/m^3	7	7.2	46	28
Ammoniacal nitrogen	g/m^3N	9	189	336	257
Turbidity	NTU	14	110	450	205
Suspended solids	g/m^3	17	230	840	420

The results from the final aerobic pond illustrate the variability in effluent quality measured from this dairy/piggery treatment system over the period prior to the establishment of the current tailored consent monitoring programme (Table 7).

Some of this variability relates to stormwater infiltration through the system and the configuration of the recent additional covered anaerobic pond preceding the final aerobic ponds provided by the treatment system over the twenty-two-year period surveyed.

Wastewater quality data recorded for the piggery treatment system between May 2011 and June 2014 have been summarised in Table 7.

Table 7 Summary of the treated wastewater analysis results from the DH Lepper Trust piggery for the period May 2011 to June 2014 (ex removal of dairy wastes)

Parameter	Unit	Number of samples	Range		Median
Conductivity @ 20°C	mS/m	13	216	311	276
pH	pH	13	7.9	8.3	8.1
Total carbonaceous BOD_5	g/m^3	13	76	150	110
Potassium (K)	g/m3	5	192	302	240
Ammoniacal nitrogen	g/m^3N	5	99	294	204
Total nitrogen (N)	g/m^3N	5	237	358	260
Total phosphorus (P)	g/m^3P	5	50	70	56
Turbidity	NTU	13	87	180	120
Suspended solids	g/m^3	13	170	310	250

Marked improvements in terms of median wastewater concentrations are apparent for total BOD_5 (35% reduction) and suspended solids (40% reduction) following the removal of dairy wastes from the treatment system, although concentrations for the parameters remain typical of piggery ponds treated wastewaters (particularly very high nutrient levels).

Sampling the final anaerobic pond wastewater discharge for nutrients was carried out on three separate occasions during 2013-2014. Nutrients: nitrogen (N), phosphorus (P) and potassium (K) were analysed to evaluate nutrient benefits when spray irrigating effluent to land commences compared to discharging treated effluent to the receiving waters.

The average discharge volume for the past five years = 14414 m^3 per annum (286 actual discharge hours x 14 l/s discharge effluent flow rate).

The nutrient results from the discharged wastewater show that the annual loading of total nitrogen (N) = 3,747 kg, phosphorus (P) = 807 kg and potassium (K) = 3,459 kg.

Trends in various parameters are graphed in Figures 6-10.

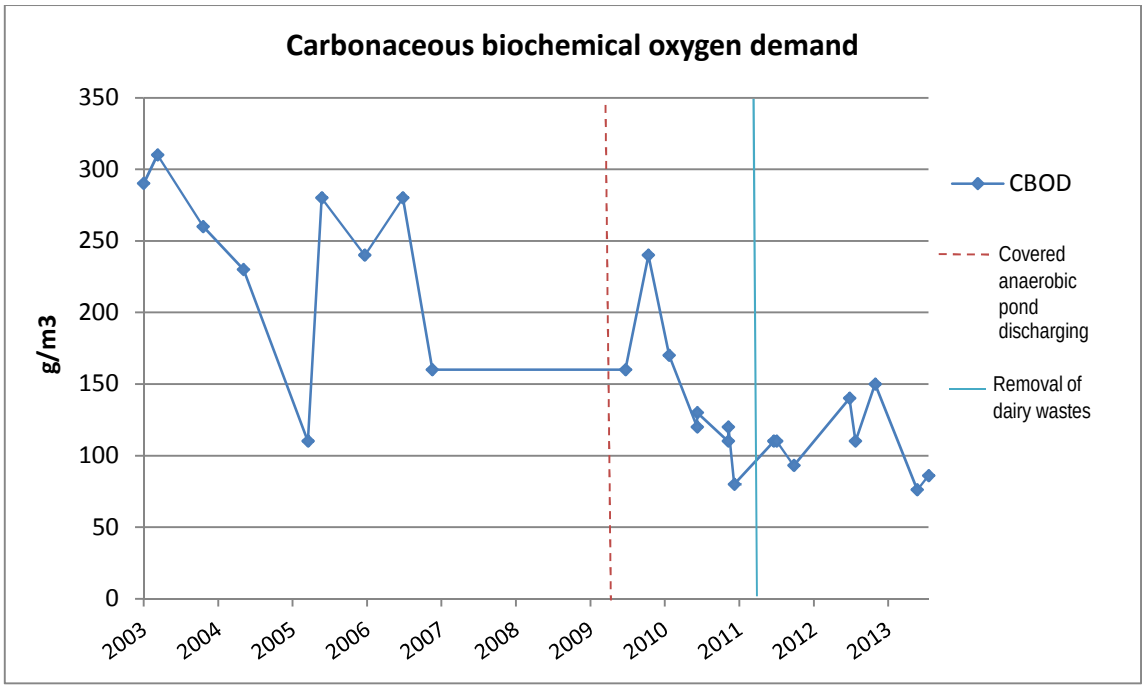

Figure 6 Wastewater carbonaceous biochemical oxygen demand levels for the 2003-2014 period

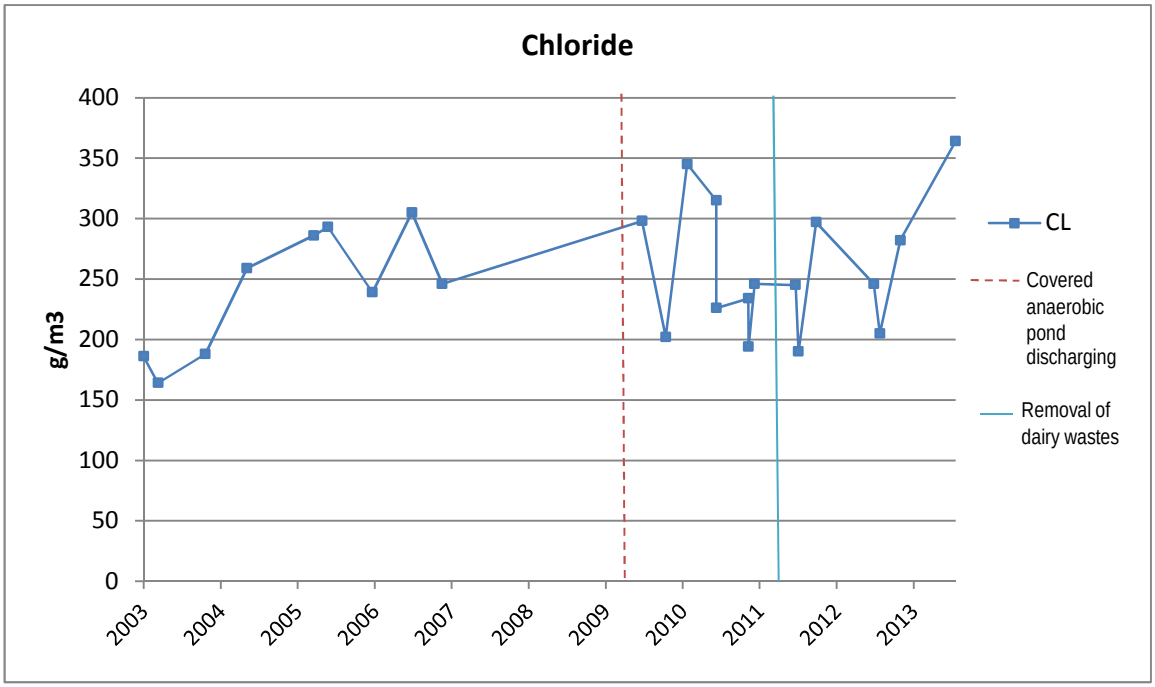

Figure 7 Wastewater chloride levels for the 2003-2014 period

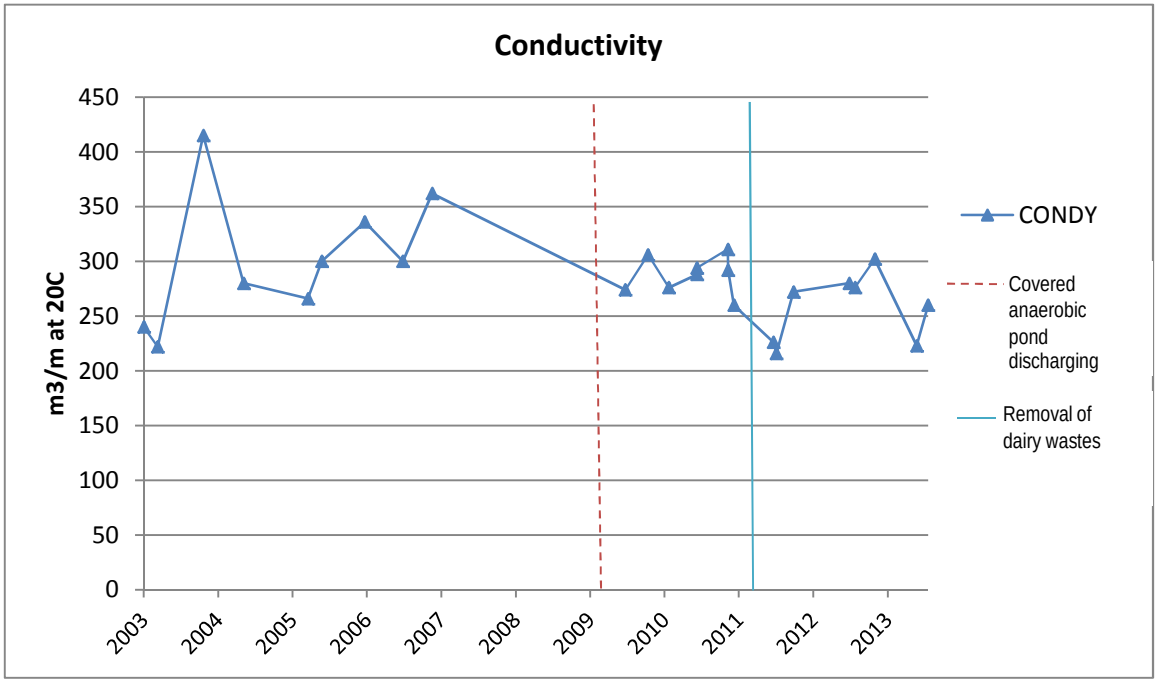

Figure 8 Wastewater conductivity levels for the 2003-2014 period

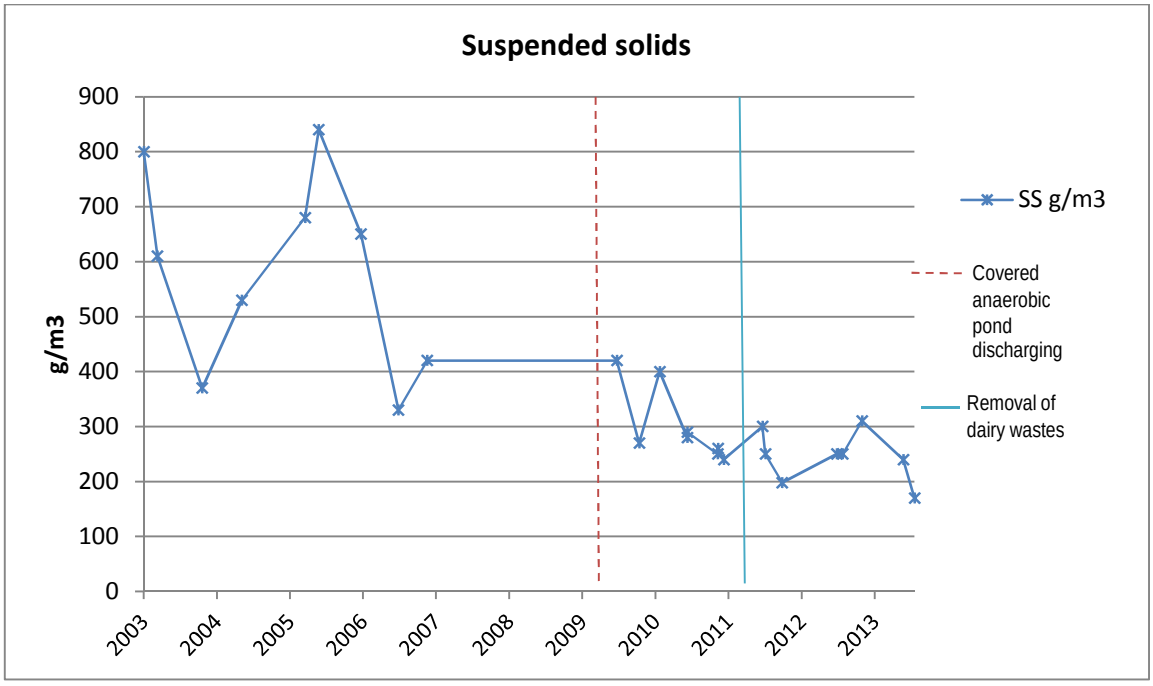

Figure 9 Wastewater suspended solids levels for the 2003-2014 period

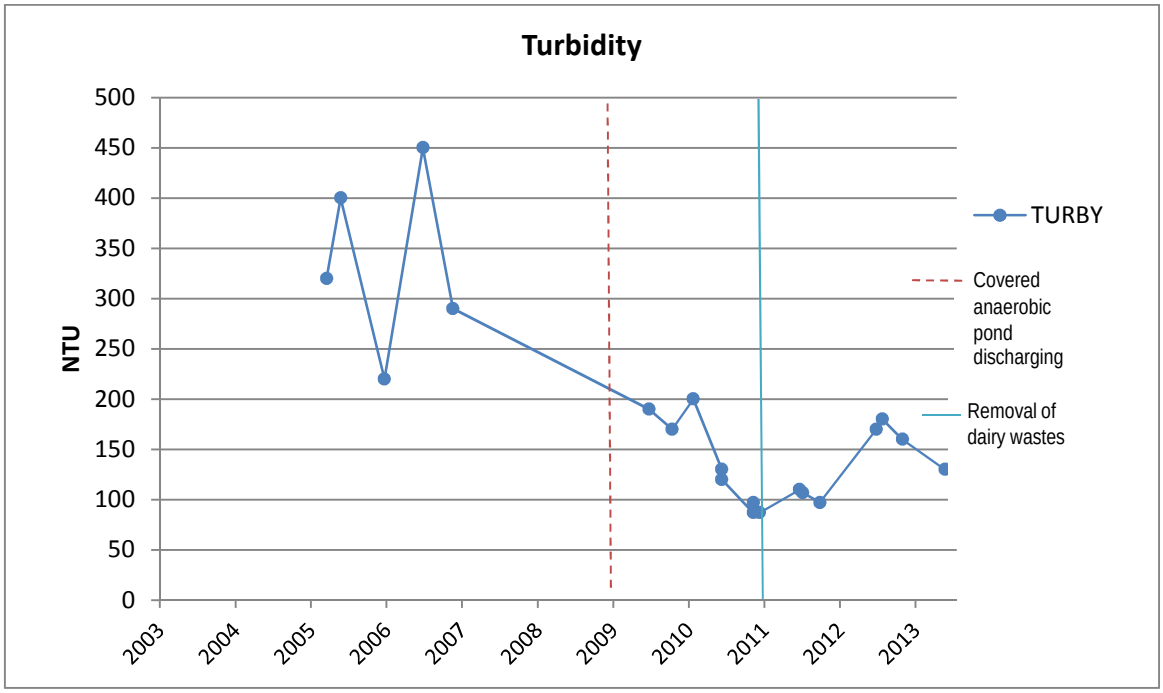

Figure 10 Turbidity levels for the 2003-2014 period

Since the pond upgrade in 2008 and removing the dairy shed effluent in 2011, in terms of wastewater quality it appears that the BOD_5, and conductivity levels have now stabilised, after an initial reduction, with suspended solids and turbidity still showing a slight downward trend. Result show that chloride appears to be fluctuating upward at this stage.

2.2.2 Treated effluent discharge records

Records of treated wastewater discharges to the Waiongana Stream supplied by the consent holder, as required by Special Condition 8 of Consent **0715-3**, are provided in Table 8.

Table 8 Discharge records of piggery treated wastes to the Waiongana Stream

Discharge period	Duration (hrs approx.)	Stream flow above 5m^3/sec while discharging
24 Jul 2013 1330 hrs to 24 Jul 2013 1630 hrs	3	Yes
22 Aug 2013 0730 hrs to 22 Aug 2013 1330 hrs	6	Yes
23 Aug 2013 1355 hrs to 23 Aug 2013 1435 hrs	0.5	Yes
29 Aug 2013 1100 hrs to 19 Aug 2013 1330 hrs	2.5	Yes
29 Aug 2013 1130 hrs to 30 Aug 2013 0500 hrs	16.5	Yes
12 Sep 2013 1100 hrs to 12 Sep 2013 1530 hrs	4.5	Yes
20 Sep 2013 0700 hrs to 20 Sep 2013 1700 hrs	10	Yes
21 Sep 2013 1000 hrs to 22 Sep 2013 1700 hrs	17	Yes
23 Sep 2013 0800 hrs to 23 Sep 2013 1530 hrs (samples collected)	7.5	Yes
11 Oct 2013 0930 hrs to 13 Oct 2013 1200 hrs	49.5	Yes
14 Oct 2013 2100 hrs to 15 Oct 2013 1715 hrs	20	Yes
25 Oct 2013 1315 hrs to 25 Oct 2013 1615 hrs	3	Yes
31 Oct 2013 0930 hrs to 31 Oct 2013 1335 hrs	4.5	Yes
01 Nov 2013 0600 hrs to 01 Nov 2013 0830 hrs	2.5	Yes
04 Dec 2013 2000 hrs to 06 Dec 2013 1000 hrs	38	Yes
04 Jan 2014 2230 hrs to 05 Jan 2014 1000 hrs	11.5	Yes
16 Apr 2014 0915 hrs to 16 Apr 2014 2310 hrs	14	Yes
17 Apr 2014 1030 hrs to 17 Apr 2014 2330 hrs (samples collected)	13	Yes
28 Apr 2014 0930 hrs to 28 Apr 2014 1400 hrs	4.5	Yes
05 May 2014 1645 hrs to 06 May 2014 0800 hrs	14.5	Yes
29 May 2014 1730 hrs to 29 May 2014 2300 hrs	5.5	Yes
10 June 2014 2230 hrs to 11 Jun 2014 1715 hrs	19	Yes
12 Jun 2014 1200 hrs to 12 Jun 2014 1700 hrs (samples collected)	5	Yes
16 Jun 2014 1130 hrs to 16 Jun 2014 1700 hrs	5.5	Yes
25 Jun 2014 0600 hrs to 27 Jun 2014 1200 hrs	6	Yes

(Note: all times in NZST)

These records indicate that the treated effluent discharge into the Waiongana Stream was well managed and that good wastewater dilution ratios have been maintained and were compliant with special condition 4 of Consent **0715-3**. The discharge records indicated that all discharges had occurred when the river flow was above the allowable 5 m^3/s which was compliant with special condition 4.

The Waiongana Stream hydrology displays a natural rapid rise and fall (typical of Taranaki ring plain streams) which allows for a limited window of opportunity when treated wastewater can be discharged above the minimum consent limit. The consent holder has access to the Taranaki Regional Council web site (www.trc.govt.nz) which provides current river flow and water levels for the Waiongana Stream recorded at SH3a at the time of discharging.

The consent holder also has access to the HydroTel text messaging service and is notified when the Waiongana Stream flow exceeds 5 m^3/s (i.e. when discharge to stream is allowed) and again when the stream flow recedes back to minimum consent conditions.

For the 2013-2014 period a total of 250.5 discharge hours were recorded compared to 283.5 hours for the 2012-2013 period, 274.75 hours for the 2011-2012 period, 311.65 hours for the 2010-2011 period and 312 hours for the 2009-2010 period. The yearly discharge hours averaged over the past five years equates to 286 discharge hours.

2.3 Air

2.3.1 Inspections

Air inspections were carried out in conjunction with all the general compliance monitoring inspections, or if odour complaints are received. There were no odour complaints concerning the piggery emissions from the ponds system, and routine inspections found no objectionable odour offsite. The covered anaerobic pond, including the removal of cowshed effluent from the piggery effluent treatment system has been hugely instrumental in reducing odour resulting in no odour complaints for the 2013-2014 monitoring period.

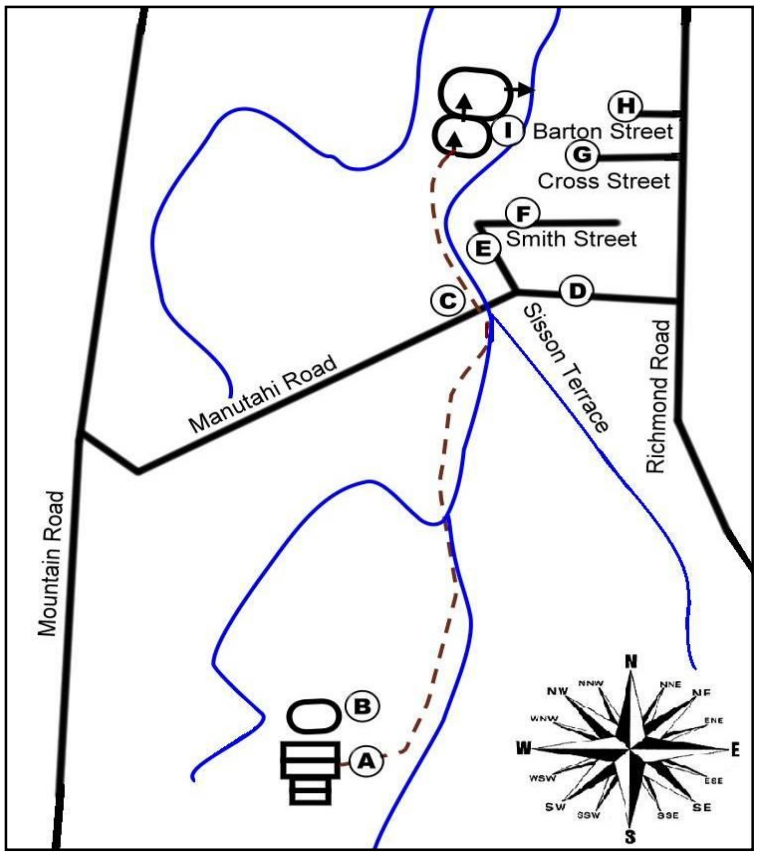

Figure 11 Odour survey monitoring locations

Operations at the piggery had previously resulted in some odour emanating offsite from the ponds system from time to time prior to installing the covered anaerobic pond. Odour issues were the result of general piggery operations and adverse weather conditions. As the piggery wastewater treatment ponds are located near a residential area in the Lepperton Township, there is no real buffer zone.

The Council uses FIDOL factors and scales to rate odour observations. The five FIDOL factors used are frequency, intensity, duration, offensiveness and location.

Frequency:

- How many times the odour is detected during the investigation.

Intensity:

- Perceived strength or concentration of the odour.
- Does not relate to degree of pleasantness or unpleasantness.
- Assessed subjectively using 0-6 scale (ambient).

0. *Not detectable - no odour*
1. *Very weak - odour detected but may not be recognisable*
2. *Weak - odour recognisable (i.e. discernible)*
3. *Distinct - odour very distinct and clearly distinguishable*
4. *Strong - odour causes a person to try to avoid it*
5. *Very strong - odour overpowering and intolerable*
6. *Extremely strong - pungent, highly offensive, overpowering and intolerable.*

Duration:
- The lengths of time people are exposed to odour.
- During an investigation how long does the odour persist.

Offensiveness:
- A rating of an odour's pleasantness or unpleasantness ("hedonic tone").
- This does not necessarily have the same meaning as offensiveness in the Act or consent condition.
- A subjective assessment which can vary between individuals, but which must also be based for compliance purposes on a 'typical 'response.

Location:
- Where the odour is detected from.
- Note type of area (for example, agricultural, residential, or industrial).

The RMA (1991) requires that there should be no offensive or objectionable odour beyond the boundary of the farm.

The pork industry's guide to managing environmental effects, deals with management practices ensuring the effect of odour is taken into account when undertaking activities relating to farm operations.

No complaints concerning piggery odour emissions were received by the Council during the 2013-2014 monitoring period.

2.4 Investigations, interventions, and incidents

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the consent holder. During the year matters may arise which require additional activity by the Council e.g. 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 2013-2014 period, it was not necessary for the Council to undertake significant additional investigations and interventions, or record incidents, in association with the DH Lepper Trust Piggery.

3. Discussion

3.1 Discussion of site performance

Consent **0715-3** expired December 2013 with no further reviews of this consent being provided for. As a result, the renewal application has been modified to include a dual system for the disposal of treated piggery effluent on site. The proposal now includes the discharge of approximately 40 % of piggery effluent to land and the remaining 60 % will continue to discharge to water. A draft effluent management plan has been submitted to Council.

Consent **5206-2** (discharge to air) is subject to change. A variation to the existing consent is required because this consent did not anticipate the additional effects associated with discharging approximately 40% of treated effluent to land, as at July 2014.

The Council has commenced a review of its Regional Freshwater Plan. The Council emphasised that the draft report 'Future Directions for the Management of Farm Dairy Effluent' has been prepared by the Council to canvas issues and initiate discussion in relation to future farm dairy effluent management in Taranaki. The NZ pork industry has been invited to take part in further discussions. The review of the RFWP will impact on the current method of effluent disposal.

The Council's policy is likely to promote spray irrigation to land in preference to discharge to water. However there may be an opportunity to further assess the option of partial discharge to land. Effluent from either the aerobic or anaerobic ponds is discharged onto and into land via irrigation at least once annually during the summer/autumn period to help minimize the adverse effects on water quality in the Waiongana Stream. Wastewater from the aerobic pond had been spray irrigated to cropping land.

As part of the feeding programme the piggery utilises large volumes of food waste products from local industries. The food wastes include up to 16 tonnes per week of various bread, pasta, pastry and pie products. The piggery also has the potential to take up to 25,000 litres of buttermilk every four days from Fonterra and Tegal poultry waste products. All meat products are cooked at the piggery as per the MPI regulations.

Throughout the 2013-2014 monitoring period the consent holder continued to utilise extracted biogas from the covered anaerobic pond for onsite energy requirements.

3.2 Evaluation of performance

Table 9 Summary of performance for Consent **0715-3** to discharge piggery and farm dairy effluent from an oxidation pond treatment system

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Operation and discharge in accordance with application	Inspections of data and discharge point inspections	Yes
2. Location and position of the	Monitoring inspections	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
discharge points		
3. Minimum dilution rate in receiving waters	Consent holder's discharge records and monitoring	Yes (with one brief exception during a trial recognised by the Council)
4. Discharge only when river conditions allow	Consent holder's discharge records and monitoring	Yes
5. Maximum concentrations in receiving water after mixing	Sampling	Yes (with one brief exception during a trial recognised by the Council)
6. Effects on receiving water after mixing	Monitoring inspections of receiving waters	Yes
7. Operation and maintenance of treatment and discharge system	Monitoring inspections	Yes
8. Records of discharge	Records received	Yes
9. Effluent of aerobic pond discharged to land	Consent holder to notify Council	Yes
10. Notification of discharging to land	Consent holder to notify Council	Yes
11. Optional review provision	No further review	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 10 Summary of performance for Consent **5206-2** to discharge emissions into the air from a pig farming operation and associated practices including solids composting, effluent treatment and other waste management activities

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of action to minimise adverse environmental effects	Monitoring inspections	Yes
2. Consultation and approval prior to alterations to plant or process	Monitoring inspections	Yes
3. Minimisation of impact and emissions through use of equipment and suitable methods	Monitoring inspections	Yes
4. Operation in accordance with application	Monitoring inspections	Yes
5. Objectionable odour at site boundary not permitted	Monitoring inspections	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
6. Objectionable dust levels at the site boundary not permitted	Monitoring inspections	Yes
7. Significant adverse ecological effect on ecosystems	Monitoring inspections	Yes
8. Maintenance and landscaping plan	Monitoring inspections	N/A
9. Maintain and operate the effluent ponds and associated activities	Monitoring inspections	Yes
10. Advise neighbours prior to irrigating effluent to land	Consent holder to advise neighbours and Council prior to irrigating to land	Yes
11. Particular regard to wind direction to minimise effects upon neighbours when discharging effluent	Monitoring inspections	Yes
12. Review of consent conditions	Under review	N/A
Overall assessment of environmental performance and compliance in respect of this consent Overall assessment of administrative performance in respect of this consent		High High

N/A = not applicable

Table 11 Summary of performance for Consent **0188-3** to take water from an unnamed tributary of the Waiongana Stream for piggery purposes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
Minimise environmental effects	Monitoring Inspections	Yes
Water abstraction not to exceed 50% of the stream flow	Monitoring Inspections	Yes
Optional review of consent	No review sought by Council	N/A
Overall assessment of environmental performance and compliance in respect of this consent Overall assessment of administrative performance in respect of this consent		High High

N/A = not applicable

During the year, the Company demonstrated a **high** level of both environmental and administrative performance and compliance with the resource consents as defined in Section 1.1.4.

(Note: The one brief non-compliance exception was recorded under marginal receiving water flow conditions where a re-assessment of mixing characteristics was undertaken in consultation with the Council and as preparation for a consent renewal process).

3.3 Recommendations from the 2012-2013 Annual Report

In the 2012-2013 Annual Report, it was recommended:

1. THAT monitoring of air emissions and discharges to natural water from the DH Lepper Trust Piggery and dairy farm in the 2013-2014 year continues at the same level as in the 2012-2013 period except where noted below.

2. THAT the consent holder continues to advise the Council of all treated wastewater discharges to the Waiongana Stream and onto land and to maintain a discharge only when the Waiongana Stream flow rate is above the allowable $5m^3$/sec.

3. THAT the consent holder monitors and maintains discharge records and forwards these records to the Council as required.

4. THAT the consent holder monitors and maintains anaerobic biogas abstraction rates (flaring and usage) and supplies details to Council if required.

5. THAT the provisions in the monitoring programme to sample the discharge and receiving waters be reviewed as a precursor of the discharge consent renewal process.

6. THAT the effluent be analysed for ammonia concentration to determine the dilution required to meet the unionised ammonia conditions.

7. THAT the consent holder provides all necessary information as requested by Council in support of consent **0715** discharge renewal process.

8. THAT a review of consent **5206** is not deemed necessary (as per section 3.5).

Recommendation 1 - was achieved. Four inspections were carried out including monitoring the wastewater and receiving waters on three separate occasions. There was no requirement to undertake and additional sampling run.

Recommendation 2 & 3 was achieved. Records received by Council show that all treated wastewater discharges to the Waiongana Stream were discharged only when the Waiongana Stream flow rate was above the allowable $5m^3$/sec.

Recommendation 4 - anaerobic biogas abstraction rates (flaring and usage). Data was not required by the Council on this occasion.

Recommendation 5 & 6 was achieved. The effluent was analysed for ammonia concentration and nutrients: nitrogen (N), phosphorus (P) and potassium (K) were analysed to evaluate nutrient benefits when spray irrigating effluent to land commences.

Recommendation 7 Consent renewal application process is underway.

Recommendation 8 Consent renewal application process is underway.

3.4 Alterations to monitoring programmes for 2014-2015

In designing and implementing the monitoring programmes for air/water discharges in the region, the Taranaki Regional Council has taken into account the extent of information made available by previous authorities, its relevance under the 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 DH Lepper Trust Piggery monitoring programme, it is proposed that for the 2014-2015 period monitoring continues as set out in the 2013-2014 compliance monitoring programme to assess any environmental effects in relation to the treated effluent discharge, and as required for the pending consent review process.

A recommendation to this effect is attached to this report.

3.5 Exercise of optional review of consent

Resource Consent **0715-3** (wastewater discharge) expired on 1 December 2013. An application for renewal has been lodged with the Council for review.

Resource Consent **5206-2** (air discharge) provides for a review of consent in June 2016.

However, Consent **5206-2** is subject to change (to include emissions to air from piggery effluent application to land) therefore a variation to the existing consent is required because this consent did not anticipate the additional effects associated with discharging approximately 40% of treated effluent to land, as at July 2014.

Resource Consent 0188-3 - No review required for June 2014. Consent expires June 2020 with no further review dates allowed for.

Based on the results of monitoring in the year under review, and in previous years as set out in earlier annual compliance monitoring reports, it is considered that there are no grounds that require a review to be pursued.

A recommendation to this effect is presented in Section 4 of this report.

4. Recommendations

1. THAT monitoring of air emissions and discharges to natural water from the DH Lepper Trust Piggery in the 2014-2015 year continues at the same level as in the 2013-2014 period except where noted below.

2. THAT the consent holder continues to advise the Council of all treated wastewater discharges to the Waiongana Stream and onto land and to maintain a discharge only when the Waiongana Stream flow rate is above the allowable $5m^3$/sec and with regard to possible non-compliance issues as flow rates become marginal.

3. THAT the consent holder monitors and maintains discharge (water and land) records and forwards these records to the Council as required.

4. THAT the consent holder monitors and maintains anaerobic biogas abstraction rates (flaring and usage) and supplies details to Council if required.

5. THAT the effluent wastewater discharged to the Waiongana Stream continues to be analysed for additional nutrients: total nitrogen (TN), total phosphorus (TP) and potassium (K) for the purpose of evaluation of nutrient benefits for spray irrigation of effluent to land.

6. THAT the consent holder provides all necessary information requested by Council in support of Consent **0715-4** application process.

7. THAT the consent holder provides all necessary information requested by Council in support of Consent **5206-2** (change to consent conditions) application process.

Glossary of common terms and abbreviations

The following abbreviations and terms are used within this report:

Al*	Aluminium.
As*	Arsenic.
Biomonitoring	Assessing the health of the environment using aquatic organisms.
BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
BODF	Biochemical oxygen demand of a filtered sample.
Bund	A wall around a tank to contain its contents in the case of a leak.
CBOD	Carbonaceous biochemical oxygen demand. A measure of the presence of degradable organic matter, excluding the biological conversion of ammonia to nitrate .
cfu	Colony forming units. A measure of the concentration of bacteria usually expressed as per 100 millilitre sample.
COD	Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
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.
Cumec	A volumetric measure of flow- 1 cubic metre per second (1 m^3s^{-1}).
DO	Dissolved oxygen.
DRP	Dissolved reactive phosphorus.
E.coli	*Escherichia coli,* an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Ent	Enterococci, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre of sample.
F	Fluoride.
FC	Faecal coliforms, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
g/m^3	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
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	Unionised ammonia, normally expressed in terms of the mass of nitrogen (N).
NO_3	Nitrate, normally expressed in terms of the mass of nitrogen (N).
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
O&G	Oil and grease, defined as anything that will dissolve into a particular. organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons).
Pb*	Lead.
pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.
Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment.
PM_{10}	Relatively fine airborne particles (less than 10 micrometre diameter).
resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	Resource Management Act 1991 and including all subsequent amendments.
SS	Suspended solids.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
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 letters 'As', to denote the amount of metal recoverable in acidic conditions. This is taken as indicating the total amount of metal that might be solubilised under extreme environmental conditions. The abbreviation may alternatively be followed by the letter 'D', denoting the amount of the metal present in dissolved form rather than in particulate or solid form.
For further information on analytical methods, contact the Council's laboratory.

Bibliography and references

Taranaki Regional Council 1990 Review of monitoring and inspectoral procedures for dairy shed oxidation pond waste treatment systems. Taranaki Regional Council Technical Report 90-42

Taranaki Regional Council 2004 DH Lepper Trust Piggery Monitoring Programme Annual Report 2003-2004 Technical Report 2004-79

Taranaki Regional Council 2005 DH Lepper Trust Piggery Monitoring Programme Annual Report 2004-2005 Technical Report 2005-24

Taranaki Regional Council 2006 DH Lepper Trust Piggery Monitoring Programme Annual Report 2005-2006 Technical Report 2006-61

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Taranaki Regional Council 2011 DH Lepper Trust Piggery Monitoring Programme Annual Report 2010-2011 Technical Report 2011-34

Taranaki Regional Council 2012 DH Lepper Trust Piggery Monitoring Programme Annual Report 2011-2012 Technical Report 2012-33

Taranaki Regional Council 2013 DH Lepper Trust Piggery Monitoring Programme Annual Report 2012-2013 Technical Report 2013-03

Miscellaneous references

Ministry for the Environment Good Practice Guide for Assessing & Managing Odour in New Zealand – June 2003

New Zealand Pork Industry Board – Pork Industry guide to Managing Environmental Effects EnviroPork – 2005

NIWA Year in Review 2011 Energy Section

Fish & Game (Taranaki Region) Re Consent 0715-3 - discharge to the Waiongana Stream (TRC ref. # 1030484)

Appendix I

Resource consents held by Lepper Trust Piggery

Discharge Permit

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

Name of Consent Holder:	DH Lepper Trust [Trustees: Steven Maxwell Lepper & Paul Robert Franklin] 326 Wortley Road R D 9 INGLEWOOD
Consent Granted Date:	13 November 2008

Conditions of Consent

Consent Granted:	To discharge emissions into the air from a pig farming operation and associated practices including solids composting, effluent treatment and other waste management activities at or about (NZTM) 1704054E-5674882N [Piggery] and 1704345E-5676156N [Ponds]
Expiry Date:	1 June 2026
Review Date(s):	June 2009, June 2011, June 2013, June 2016, June 2020
Site Location:	Mountain Road, Lepperton
Legal Description:	Lot 3 DP 21006 [Piggery] & Pt Lot 1491, Pt Lot 2 DP 2634 [Ponds]

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 number of pigs [equivalent 50 kg per pig] on the property at any one time shall not exceed 3500 pig equivalents.

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

3. Before 30 September 2009, the development of the covered anaerobic pond shall be completed. From that date gases emanating from the covered anaerobic pond shall be captured and appropriately utilised as an energy source.

4. Prior to undertaking any alterations to the piggery unit's processes, operations, equipment or layout, which may significantly change the nature or quantity of contaminants emitted from the site, the consent holder shall consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act 1991 and its amendments.

5. The consent holder shall minimise the emissions and impacts of contaminants discharged into air from the site by:

   a) the selection of the most appropriate process equipment;
   b) process control equipment and emission control equipment;
   c) the methods of control;
   d) the proper and effective operation, supervision, maintenance and control of all equipment and processes; and
   e) the proper care of all pigs on the site.

6. Subject to condition 7, the discharges authorised by this consent shall not give rise to an odour at or beyond the property boundary that is offensive or objectionable.

7. To allow for the conversion of the existing anaerobic pond to an aerobic state, discharges from this pond may give rise to intermittent offensive and objectionable odour beyond the property boundary until 30 September 2009.

8. For the purposes of condition 6 and 7, an odour shall be deemed to be offensive or objectionable if:

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

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

9. The consent holder shall provide an Odour Management Plan that details to the satisfaction of the Chief Executive of Taranaki Regional Council how odorous emissions beyond the property boundary will be minimised by 30 September 2009. The plan shall include:

   i) Define the environmental effect/s being managed by the plan and the objective sought in relation to this effect;

   ii) Identify key personnel responsible to managing the effect;

   iii) Describe the activities on the site and describe the main potential sources of odour emissions;

   iv) Identify and describe methods of mitigation and operating procedures including the dewatering of the anaerobic pond or during control contingency discharge events;

   v) Monitoring methods including record keeping of maintenance and control parameters, any odour complaints received and weather conditions present at time of complaints.

   Thereafter, the piggery and associated waste management practices shall be operated in accordance with the plan.

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 2009 and/or June 2011 and/or June 2013 and/or June 2016 and/or June 2020, 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 13 November 2008

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	DH Lepper Trust [Trustee: Steven Maxwell Lepper] 326 Wortley Road R D 9 INGLEWOOD 4389
Decision Date [Change]:	23 February 2011
Commencement Date [Change]:	23 February 2011 [Granted: 18 December 2002]

Conditions of Consent

Consent Granted:	To discharge treated piggery effluent from an oxidation pond treatment system into the Waiongana Stream during fresh [high flow] conditions at or about (NZTM) 1704451E-5676184N
Expiry Date:	1 December 2013
Site Location:	Manutahi Road, Lepperton
Legal Description:	Pt Lot 2 DP 2634
Catchment:	Waiongana

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

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
   i) the administration, monitoring and supervision of this consent; and
   ii) charges authorised by regulations.

Special conditions

1. The consent holder shall, at all times, operate the piggery and associated activities and discharges in accordance with the information provided in support of application 1649, including the management and contingency plans, except as otherwise required or directed by the conditions set out in this resource consent.

2. The discharge point into the Waiongana Stream shall be located at 1704451E-5676184N. The point of discharge shall be beneath the surface of the receiving water.

3. A minimum dilution rate of 1 part effluent to 250 parts receiving water shall be maintained at all times in the receiving water at the point of discharge, during discharge events

4. Discharge from the ponds to the Waiongana Stream shall occur only when the flow in the Waiongana Stream measured at the Taranaki Regional Council SH3A monitoring site is greater than 5 cumecs (5 cubic metres per second).

5. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not cause the receiving waters of the Waiongana Stream to exceed the following concentrations:

Constituent	**Concentration**
Unionised ammonia	0.025 gm^{-3}
Filtered carbonaceous BOD_5	2.0 gm^{-3}

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

   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, habitats or ecology.

7. The consent holder shall operate and maintain the treatment and discharge system to ensure that the conditions of this consent are met.

8. The consent holder shall monitor and maintain records of the discharge including date, rate, and volume discharged to the Waiongana Stream; and date, volume and area of land discharge occurs to onto and into land; and shall make these records available to the Chief Executive, Taranaki Regional Council, upon request.

9. Effluent from the aerobic pond shall be discharged onto and into land via irrigation at least once annually during the summer/autumn period, to minimise the adverse effects on water quality in the Waiongana Stream, to the satisfaction of the Chief Executive, Taranaki Regional Council.

10. The Chief Executive, Taranaki Regional Council shall be advised in writing at least 24 hours prior to any irrigation onto and into land from the aerobic pond.

11. 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 2004 and/or June 2008, 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, including but not limited to:

    a) dilution rate
    b) maximum discharge rate
    c) concentrations of constituents of the discharge
    d) concentrations of constituents of the receiving water.

Signed at Stratford on 23 February 2011

For and on behalf of
Taranaki Regional Council

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Director-Resource Management