

DH Lepper Trust (Piggery)
Monitoring Programme
Annual Report
2016-2017

Technical Report 2017-68

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Executive summary

DH Lepper Trust (the Trust) operates a piggery located on Mountain and Manutahi Roads at Lepperton, in the Waiongana catchment. This report for the period July 2016 to June 2017 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Trust's environmental and consent compliance performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of the Trust's activities.

The Trust holds three resource consents, which include a total of 38 conditions setting out the requirements that the Trust must satisfy. The Trust holds one consent to allow it to take and use water, one consent to discharge treated effluent into the Waiongana Stream and to land, and one consent to discharge emissions into the air from the piggery operation.

The consent to discharge effluent requires that the existing disposal system, of discharge to the Waiongana Stream at times of high flow, be converted in stages by June 2020 to a dual land/water disposal system. A minimum land area for effluent application is set, and discharge to land must be maximised. A Land Disposal Options Report, detailing the feasibility of disposing of all effluent to land, is to be produced by June 2021.

During the monitoring period, the Trust demonstrated a good level of environmental performance.

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

The monitoring has shown that the consent holder ensured to discharge treated effluent into the Waiongana Stream only when the river flow was greater than five cubic meters per second. There was compliance with conditions on receiving water effects.

However, the limit on effluent suspended solids concentration was breached on each monitoring occasion and the carbonaceous biochemical oxygen demand limit was breached on one occasion in the discharge samples collected. Due to the significant dilution factor at the time of discharge to the stream, the likely environmental impact of these breaches is considered to be negligible. An application to vary consent 0715-4 to address the suspended solids limit was lodged (in September 2017), in recognition of the highly turbid state to the Waiongana Stream at times of effluent discharge.

Progress with implementation of the dual land/water disposal system was satisfactory. Electricity supply for effluent irrigation was installed, a pump shed was constructed, and reticulation pipework purchased. Discharge to land is scheduled to commence in 2017-2018.

A combined Management Plan, for operation of the dual disposal system, protection of soil, and control of odour, was in preparation at the end of the review period.

During the year, the Trust demonstrated a good level of environmental and administrative performance with the resource consents.

For reference, in the 2016-2017 year, consent holders were found to achieve a high level of environmental performance and compliance for 74% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 21% of the consents, a good level of environmental performance and compliance was achieved.

This report includes recommendations for the 2017-2018 year.

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1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is for the period July 2016 to June 2017 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by DH Lepper Trust (the Trust). The Trust operates a piggery situated on Mountain Road at Lepperton, in the Waiongana catchment.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by the Trust that relate to a discharge of treated piggery effluent to water and land within the Waiongana catchment, and the air discharge permit to cover emissions to air from the site.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of the Trust's use of water, land and air, and is the 14th combined annual report by the Council for the Trust.

1.1.2 Structure of this report

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

- consent compliance monitoring under the RMA and the Council's obligations;
- the Council's approach to monitoring sites through annual programmes;
- the resource consents held by the 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 at the Trust's site.

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

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

Section 4 presents recommendations to be implemented in the 2017-2018 monitoring year.

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

1.1.3 The Resource Management Act 1991 and monitoring

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

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

- e. risks to the neighbourhood or environment.

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

1.1.4 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by the Trust, this report also assigns a rating as to their environmental and administrative performance during the period under review.

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

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

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

Environmental Performance

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

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

For example:

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

Improvement required: Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent

minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

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

Administrative performance

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

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

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

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

For reference, in the 2016-2017 year, consent holders were found to achieve a high level of environmental performance and compliance for 74% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 21% of the consents, a good level of environmental performance and compliance was achieved.

1.2 Process description

DH Lepper Trust operates a 'farrow to finish' piggery breeding and fattening unit. The approximate weights and numbers of the pigs are shown in Table 1 below and the location of the piggery, land and wastewater treatment system within the Lepperton Township is shown in Figure 1.

The pigs are housed in purpose-built sheds 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, waste sausages and chicken by-products from local suppliers, are mixed to produce a protein meal for the stock.

Table 1 Piggery composition as at 30 June 2017

Type of pigs	No of pigs	Average weight kg	Total weight kg	50 kg Equivalent pigs
Sows	425	162	68,850	1377
Light porkers (3 months)	1,362	65	88,530	1770
Store pigs (2½ months)	350	44	15,400	308
Weaners (5 – 8 weeks)	668	16	10,688	213
Total	2,805			3,668

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 at a ratio 1:1 with sawdust. This mixture is then transferred to a large covered compost bunker where over a 40 day period it is aerated and heated to 70°C 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 is 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 m³ 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 **0715-4**.

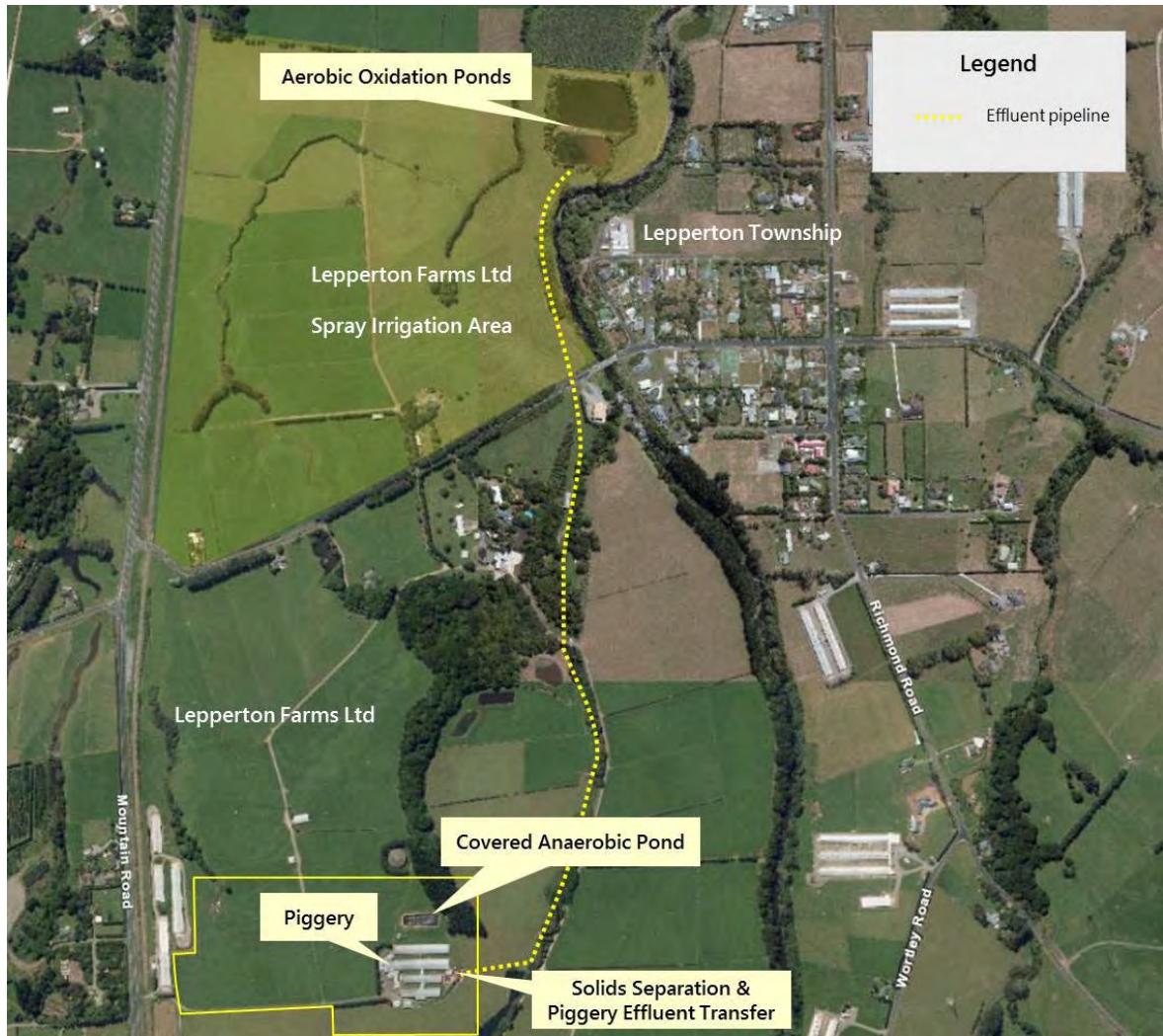


Figure 1 Location of DH Lepper Trust piggery and Lepperton

1.3 Resource consents

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.

DH Lepper Trust holds water permit **0188-3** to cover the take of water from an unnamed tributary of the Waiongana Stream for piggery operation purposes. This permit was issued by the Council on 09 January 2001 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.

Special condition 3 is a review provision.

The permit is attached to this report in Appendix I.

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consent(s) which is/are appended to this report.

1.3.2 Water discharge permit

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

The Trust holds water discharge permit **0715-4** to discharge piggery effluent from a treatment pond system to land and into the Waiongana Stream during fresh (high flow) conditions. This permit was renewed by the Council on September 2015 under Section 87(e) of the RMA. The consent now includes the discharge of approximately 40 % of piggery effluent to land and the remaining 60 % will continue to discharge to water.

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 (for example appearance, turbidity) while biological effects may be more subtle.

This permit was issued by the Council on 29 September 2015 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

Twenty seven special conditions are included in Resource Consent 0715-4:

Special condition 1 requires that the discharge of treated effluent to land be maximised and the discharge to water to be minimised.

Special condition 2 relates to effluent produced from the allowable number of pigs (3,529 50 kg pig equivalents) on the property at any one time.

Special condition 3 requires the consent holder to adopt the best practical option to prevent or minimise any actual or likely adverse effects.

Special condition 4 requires effluent to be treated via an approved wastewater treatment system.

Special condition 5 requires the discharge is only from the aerobic pond.

Special conditions 6, 7, 8, and 9 require the consent holder to operate and maintain the treatment and discharge system to ensure compliance.

Special condition 10 requires the consent holder to monitor and to maintain records of the discharge.

Special conditions 11 and 12 require the consent to be exercised in accordance to the Piggery Effluent Disposal Management Plan and the Effluent Irrigation Management Plan.

Special condition 13 requires the consent holder to provide a Land Disposal Options Report before June 2021.

Special condition 14 requires that plans and reports are to be provided to the Chief Executive (TRC) and Fish & Game.

[Discharge to Water conditions](#)

Special condition 15 defines that the discharge to water shall not exceed 16 litres per second.

Special condition 16 defines a minimum flow in the Waiongana Stream above which the discharge may occur.

Special conditions 17, 18, 19 and 20 define the mixing zone and prohibit a number of effects.

[Discharge to Land conditions](#)

Special conditions 21 and 22 require the consent holder to apply effluent evenly to land and prevent ponding.

Special condition 23 and 24 refer to the allowable application rate of potassium and nitrogen to land.

Special condition 25 requires that the discharge is not to occur within 25 meters of any surface water body.

Special condition 26 refers to procedures where partially or untreated effluent (accidental or otherwise) has escaped to surface water.

Special condition 27 provides for review of any or all the conditions of the consent.

The permit is attached to this report in Appendix I.

1.3.3 Air discharge permit

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

The Trust holds air discharge permit **5206-2.1** to cover discharge emissions into the air from a pig farming operation and associated practices, including solids composting, effluent treatment system, effluent application to land and other waste management. This permit was issued by the Council on 29 September 2015 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

Eight special conditions are attached to the consent.

Special condition 1 requires the number of pigs (equivalent = 50 kg per pig) on the property at any one time shall not exceed 3,529 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 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 4 requires the consent holder to minimise the emissions and impacts of air contaminants discharged into air from the site.

Special condition 5 and 6 restrict odours at or beyond the boundary of the site.

Special condition 7 requires the consent holder to provide an Odour Management Plan in accordance with consent 0715-4.

Special condition 8 provides for review of any or all of the conditions of the consent.

The permit is attached to this report in Appendix I.

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consent(s) which is/are appended to this report.

1.4 Monitoring programme

1.4.1 Introduction

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

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

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 Council in:

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;
- in discussion over monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

1.4.3 Site inspections

The piggery was visited three times during the monitoring period. With regard to consents for the abstraction of or discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, 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 Council undertook sampling of both the discharges from the site and the water quality upstream and downstream of the discharge point and mixing zone.

The piggery discharge was sampled on three occasions, and the samples analysed for conductivity, chloride, turbidity, suspended solids, BOD₅ (total carbonaceous) and temperature. 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, BOD₅ (filtered carbonaceous), ammonia-N, DRP and temperature.

The locations of the water sampling locations are illustrated in Figure 11. 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). Wastewater discharge samples are collected from the pond edge as near as possible to the discharge outlet.

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 Inspections

25 August 2016

The first inspection for the monitoring period was carried out during calm, wet, showery weather conditions. Normal piggery-type odours around the piggery buildings were evident but nothing was detected further away from the piggery. The pond leveling tank was flowing to the main collection area. An extra pump had been in use to help push effluent through the discharge pipe which partially blocks with struvite formation. Run off from the grunt mixing area is directed to the main collection area and then pumped on to the pond system. The aerobic ponds had adequate storage available and were not discharging at the time of inspection. No odour was detected around the bottom two aerobic ponds. Compliance with consent conditions was found to be satisfactory at the time of inspection.

15 November 2016

The second inspection for the monitoring period was undertaken during wet weather conditions with a strong northerly wind blowing. Slightly noticeable odour was emanating near the leveling tank but no odour was noticed further away from that area. The piggery wastewater collection sump area situated directly below the grunt mixing area was pumping at the time of inspection - only slightly recognisable odour was detected when standing nearby. All effluent was being treated via the treatment ponds system. Only normal piggery odour could be detected downwind of the site. Maintenance work to prevent pipe blockage caused by struvite crystal formation was being undertaken. The aerobic ponds were showing some light microbial activity at the time of inspection. No odour was detected near or around the pond perimeter.

17 May 2017

A slight northerly breeze was blowing at the time of inspection. There were slightly recognisable odours detected downwind of the piggery. No odour was found to be coming off site beyond the boundary. The leveling tank was working well with no sign of any recent overflow or spillage. The covered anaerobic digester producing methane gas was being utilised for power production. The digester cover appeared to eliminate all odour from around the pond. The grunt area and the main collection area below the sheds appeared to be satisfactory with all wastes being collected and directed to the lower aerobic ponds. A pump shed had been built on the western end of the final pond for the pumping of effluent to pasture. A power pole transformer has been installed at Manutahi Road and 500m of power cable had been trenched to the pump shed. Overall, the piggery treatment system appeared to be working well and was well managed.

2.1.2 Wastewater trends over time

Wastewater quality data recorded for the piggery treatment system between May 2011 and June 2017 have been summarised in Table 2. This covers the period since dairy wastes were removed from the system.

Table 2 Summary of the treated wastewater analysis results from the DH Lepper Trust piggery for the period May 2011 to June 2017 (removal of dairy wastes)

Parameter	Unit	Number of samples	Range		Median
Conductivity @ 20°C	mS/m	22	212	313	274
pH	pH	22	7.6	8.3	8.0
Carbonaceous BOD ₅	g/m ³	22	35	240	110
Ammoniacal nitrogen	g/m ³ N	14	84	294	201
Turbidity	NTU	21	59	180	115
Suspended solids	g/m ³	21	96	350	250
Chloride	g/m ³	21	190	475	282
Total nitrogen (N)	g/m ³ N	5	237	358	260
Total phosphorus (P)	g/m ³ P	5	50	70	56
Potassium (K)	g/m ³	5	192	302	240

Trends in various parameters are graphed in Figure 2 to Figure 6.

Marked improvements in terms of median wastewater concentrations are apparent for total BOD₅ (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 aerobic pond wastewater discharge for nutrients was carried out on five separate occasions during 2013-2014 (Table 2). This was to evaluate nutrients: nitrogen (N), phosphorus (P) and potassium (K) when spray irrigating effluent to land commences.

The nutrient results from discharged wastewater indicate that the annual loading of total nitrogen (N) = 3,551 kg, phosphorus (P) = 764 kg and potassium (K) = 3,277 kg.

The average discharge volume for the past eight years has been 14,137 m³ per annum (238 actual discharge hours x 14 L/s discharge flow rate).

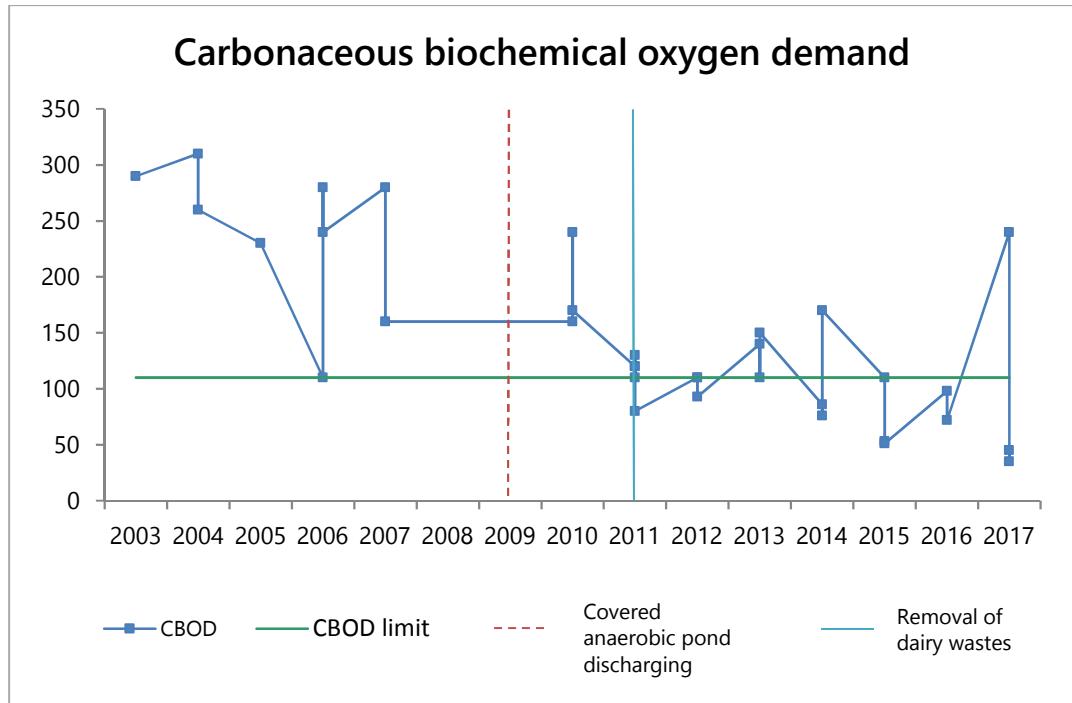


Figure 2 Wastewater carbonaceous biochemical oxygen demand levels for the 2003-2017 period, g/m³

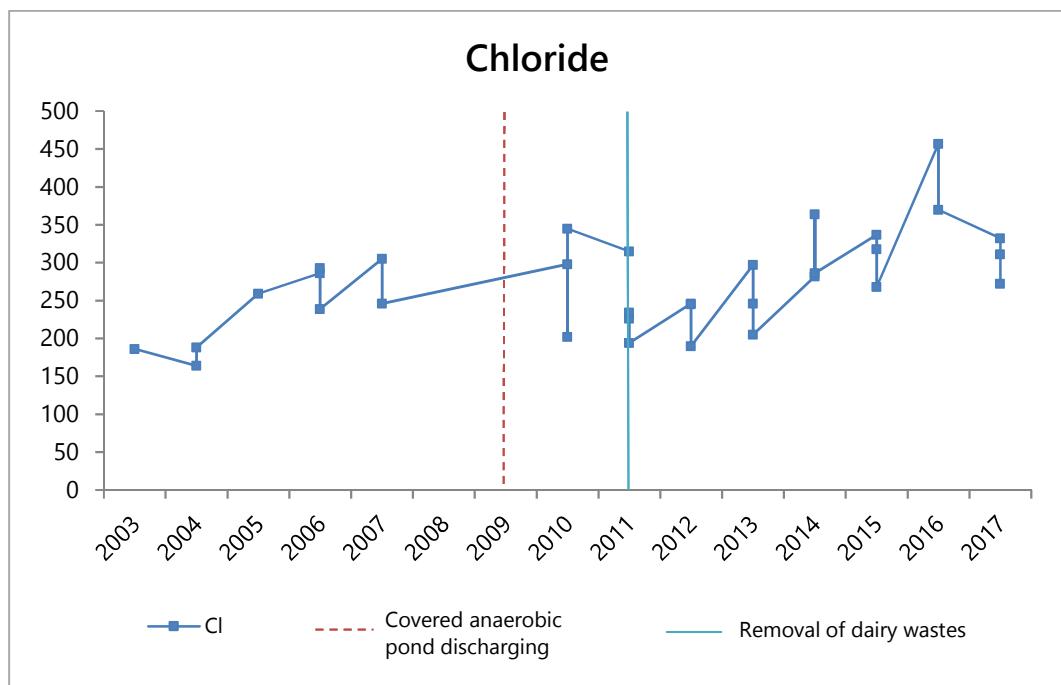


Figure 3 Wastewater chloride levels for the 2003-2017 period, g/m³

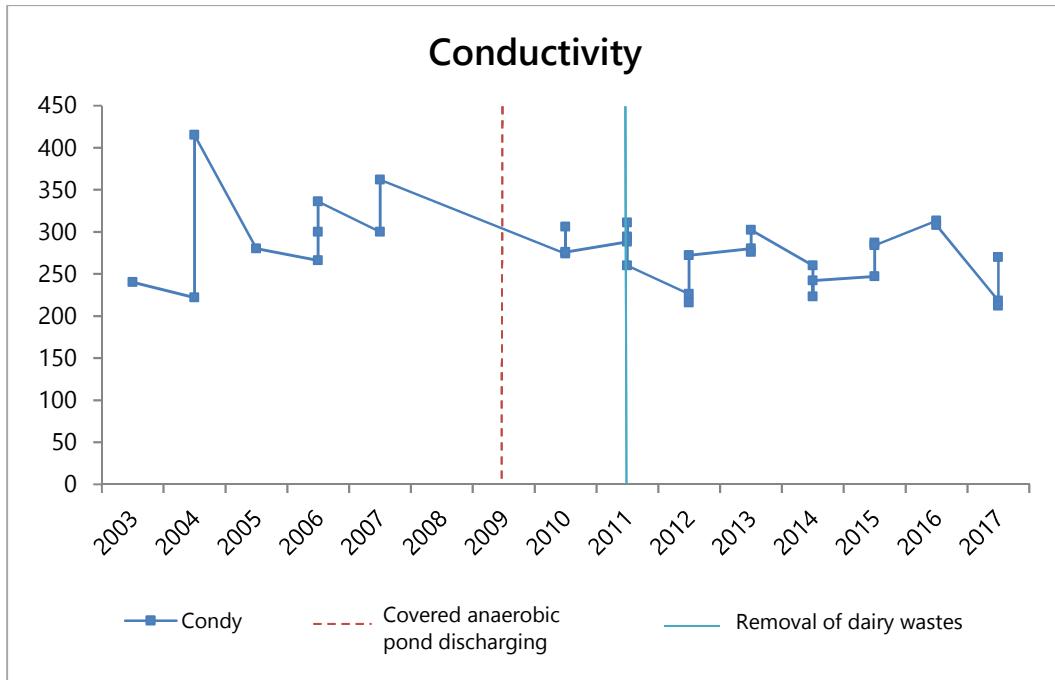


Figure 4 Wastewater conductivity levels for the 2003-2017 period, mS/m @ 20°C

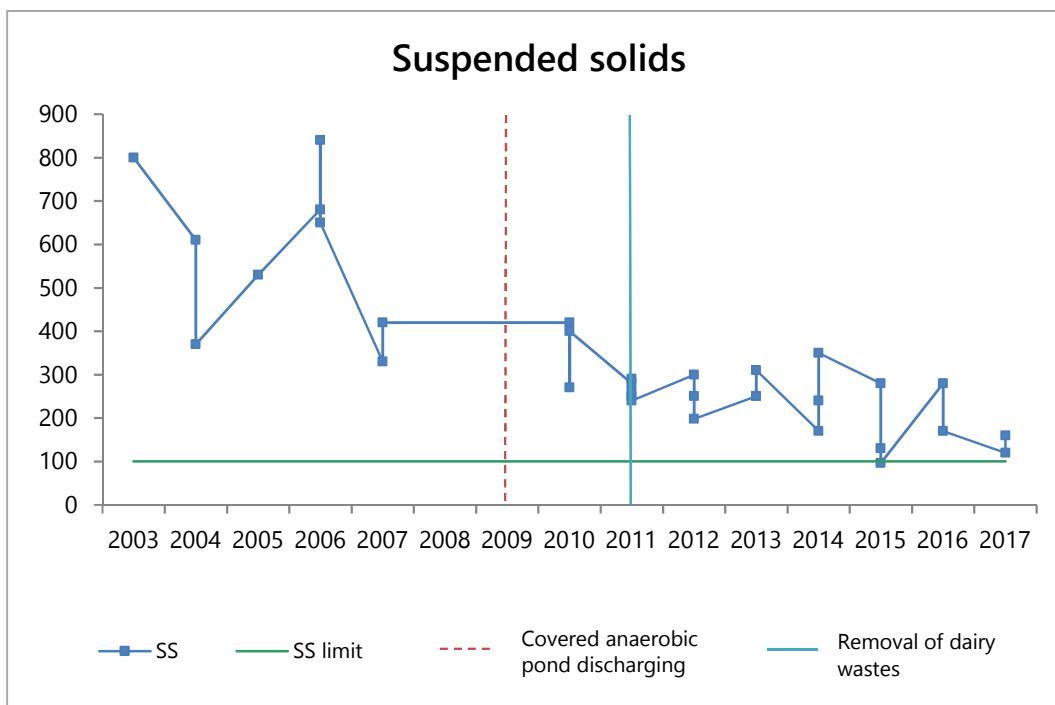


Figure 5 Suspended solids levels for the 2003-2017 period, g/m³

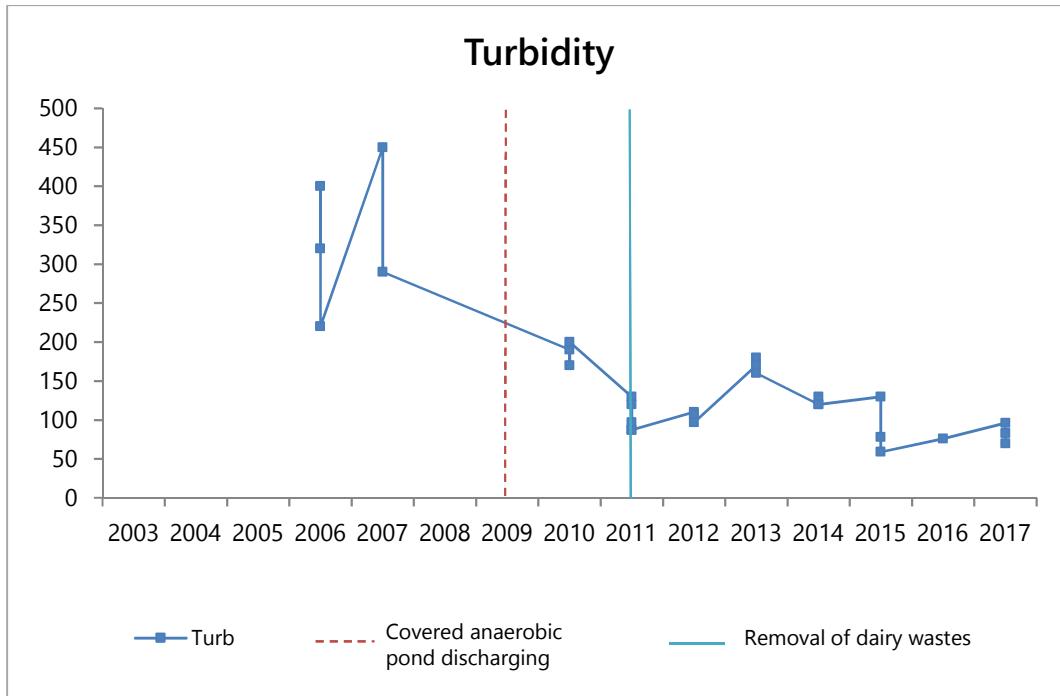


Figure 6 Turbidity levels for the 2003-2017 period, NTU

Since the wastewater system upgrade in 2008 and removal of dairy shed effluent in 2011, in terms of wastewater quality it appears that BOD_5 (Figure 2) is still showing a slight downward trend. Chloride (Figure 3), conductivity (Figure 4), suspended solids (Figure 5) and turbidity (Figure 6) levels now show the levels appear to have stabilised. Suspended solids and carbonaceous biochemical oxygen demands consent limits were not met during the monitoring period.

2.1.3 Results of discharge and receiving waters physicochemical monitoring

During the monitoring period, three surveys of the piggery site were conducted by the Council. Samples were collected on three separate occasions from three sites as shown in Figure 7 and listed in Table 3. Typically, the consent holder will notify the Council when the discharge to water is being exercised as per consent 0714-4 conditions 15 to 17. The physicochemical analysis of the samples was undertaken in the Council's IANZ registered laboratory.

Table 3 Location of sampling sites in the Waiongana Stream

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



Figure 7 Location of sampling sites

Survey of 19 January 2017

Samples were collected approximately two hours after the discharge had commenced during fine but windy weather conditions after a period of heavy rain throughout the catchment. At the time of sampling, the stream was running at a swift, moderately high (recession) flow at a rate of approximately $26 \text{ m}^3/\text{s}$ (Figure 8). The stream was highly turbid and dark brown in colour. The piggery wastewater flow rate from the final pond was throttled back throughout the period of discharge to approximately 10 L/sec . The wastewater discharge from the final 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 six hours, ceasing when the stream flow had fallen to $5.5 \text{ m}^3/\text{s}$. The pond level was lower than normal at the commencement of discharge. Pukeko were seen in the pond for the first time, around the outlet.

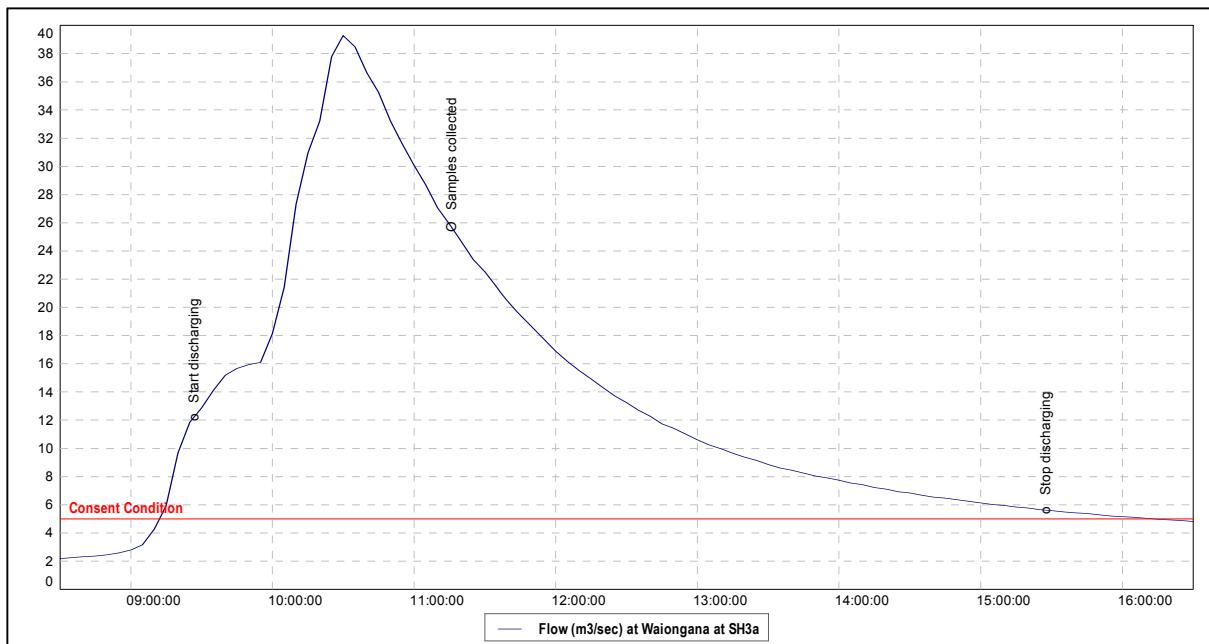


Figure 8 Flow data recorded for the Waiongana Stream for the duration of the piggery wastewater discharge commencing 19 Jan 2017 at 0930 hrs and finishing 19 Jan 2017 at 1530 hrs

Samples were collected upstream, downstream and at the discharge point. The results of the samples analysed are provided in Table 4.

Table 4 Results of the receiving water compliance survey of 19 January 2017

Site		WGA000361	PGP002002	WGA000363	Consent
Parameter	Unit	Upstream	Discharge	50 m d/s	limit
Time	NZST	1110	1055	1120	
Temperature	°C	17.5	21.8	17.3	
Conductivity @ 20°C	mSm	8.8	218	8.7	
Chloride	g/m³	10.6	332	10.4	
pH	pH	7.6	7.6	7.6	
BOD ₅ (total carbonaceous)	g/m³	-	240	-	110 (discharge)
BOD ₅ (carbonaceous filtered)	g/m³	2.0	-	2.7	2.0 (d/s)
Ammoniacal nitrogen	g/m³N	0.111	85.4	0.165	
Un-ionised ammonia	g/m³N	0.0017	1.829	0.0025	0.025 (d/s)
Dissolved reactive phosphorus	g/m³P	0.039	-	0.066	
Suspended solids	g/m³	140	1,600	140	100 (discharge)
Turbidity	NTU	75	960	67	
Appearance		Turbid, brown	Turbid, brown	Turbid, brown	

Consent **0715-4** allows a maximum wastewater discharge rate of 16 L/sec and requires a minimum receiving water flow of 5m³/s. That is, a minimum dilution ratio of 312.5:1.

These results indicated that the dilution rate was about 1 part effluent to 2,600 and 600 parts receiving water based on flow data and assumed flow rate. Given the significant dilution factor, the high BOD and

suspended solids values in the discharge would have a negligible effect on the receiving water quality throughout the discharge period.

The increase of 0.054 g/m³N in ammoniacal nitrogen correlated with the un-ionised ammonia result which increased by a similar factor. As pH and temperature remained relatively stable between upstream and downstream sites, it is unlikely that the ratio of ammoniacal nitrogen to unionised ammonia would change significantly. The unionised ammonia result in the downstream sample met the limit imposed by Special Condition 20 at the time of survey.

The filtered carbonaceous BOD₅ upstream was already at the consent limit of 2.0 g/m³ that is not allowed to be exceeded by the discharge, and apparently increased across the mixing zone by 0.7 g/m³. Given that the calculated wastewater dilution was at least 600-fold and that the (unfiltered) carbonaceous BOD₅ measured for the wastewater was 240 g/m³, an increase in filtered carbonaceous BOD₅ across the mixing zone of only between 0.1 and 0.4 g/m³ would be expected to be caused by the discharge. This suggests that the upstream BOD₅ in the Waiongana Stream was fluctuating significantly in the flood conditions, and that no breach of the consent limit on receiving water BOD₅ was demonstrated.

The discharge had minimal to no impact in terms of pH, conductivity, and suspended solids at the mixing zone boundary. The visual assessment in relation to compliance with Special Condition 11(e) indicated no change in the visual clarity or colour of the receiving waters at the boundary of the mixing zone. It is noted that the suspended solids concentration in the receiving water both upstream and downstream, at 140 g/m³, was higher than the 100 g/m³ that is allowed in the discharge.

The sample of piggery pond wastewater showed significant deterioration (Figure 2) compared to recent median levels for BOD₅. The carbonaceous BOD₅, exceeded the new consent limit of 110 g/m³, by a factor of 120%. These high levels were possibly because, as the pond level was low before discharge began, a shorter residence time than usual afforded a less than normal degree of treatment. Alternatively, the waterfowl (pukeko) seen wading around the outlet may have disturbed the sediment, suspending organic material that exerted higher oxygen demand. Conductivity and ammoniacal nitrogen showed similar stable trends as in previous years, and pH, at 7.6, was the lowest measured to date. The very high suspended solids and turbidity results were suspected to have resulted from a relatively low pond level combined with wind action near the pond outlet.

[Survey of 04 April 2017](#)

Samples were collected approximately two hours after the discharge had commenced during wet, windy weather conditions after a period of heavy rain throughout the catchment. At the time of sampling the stream was running at a swift, moderate flow with a stream flow of approximately 10 m³/s (Figure 3). The river was turbid brown in colour, peaking at approximately 87 m³/s. The piggery discharge flow rate from the final pond was estimated at 15 L/s. The wastewater discharge from the final 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 56 hours before ceasing when the river flow had fallen to 9 m³/s.

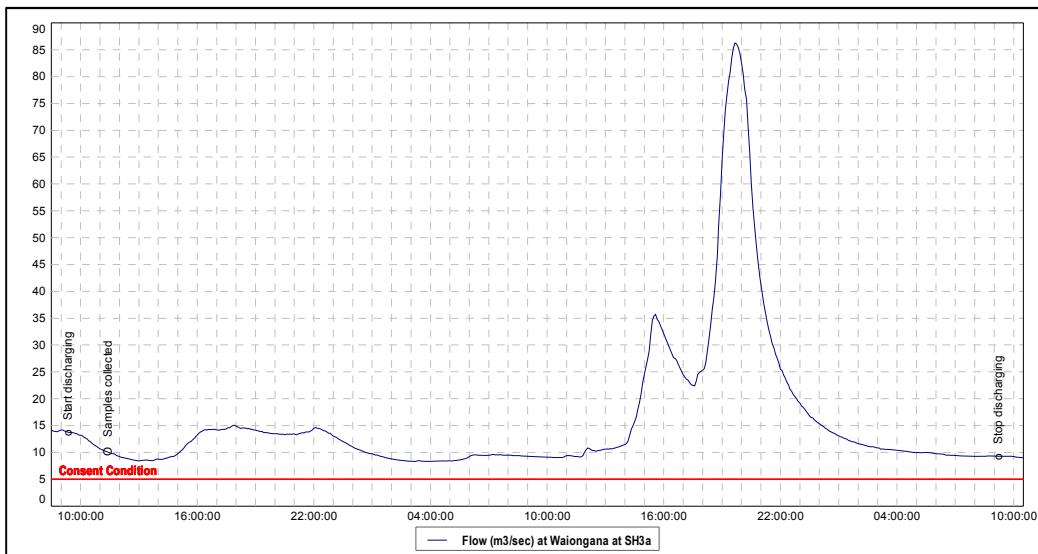


Figure 9 Flow data recorded for the Waiongana Stream for the duration of the piggery wastewater discharge commencing 4 Apr 2017 at 1030 hrs and finishing 6 Apr 2017 at 1030 hrs

Samples were collected upstream, downstream and at the discharge point. The results of the samples analysed are provided in Table 5.

Table 5 Results of the receiving water compliance survey of 4 April 2017

Site		WGA000361	PGP002002	WGA000363	Consent
Parameter	Unit	Upstream	Discharge	50 m d/s	limit
Time	NZST	1225	1230	1245	
Temperature	°C	14.6	14.4	14.3	
Conductivity @ 20°C	mSm	11.5	212	11.8	
Chloride	g/m³	10.5	311	11.1	
pH	pH	7.6	7.9	7.6	
BOD ₅ (total carbonaceous)	g/m³	-	35	-	110 (discharge)
BOD ₅ (carbonaceous filtered)	g/m³	1.7	-	1.5	2.0 (d/s)
Ammoniacal nitrogen	g/m³N	0.246	94.3	0.373	
Un-ionised ammonia	g/m³N	0.0031	2.3178	0.0046	0.025 (d/s)
Dissolved reactive phosphorus	g/m³P	0.091	-	0.156	
Suspended solids	g/m³	86	120	80	100 (discharge)
Turbidity	NTU	58	83	57	
Appearance		Turbid brown	Turbid brown	Turbid, brown	

Based on flow data at the time of sampling the dilution rate was about 1 part effluent to 670 parts receiving water and therefore well in compliance with Special Conditions 15 and 16 at the boundary of the mixing zone at the time of the survey.

An increase of 0.127 g/m³N in ammoniacal nitrogen did not result in non-compliance with the un-ionised ammonia N limit imposed by Special Condition 20. There was no measurable increase in filtered

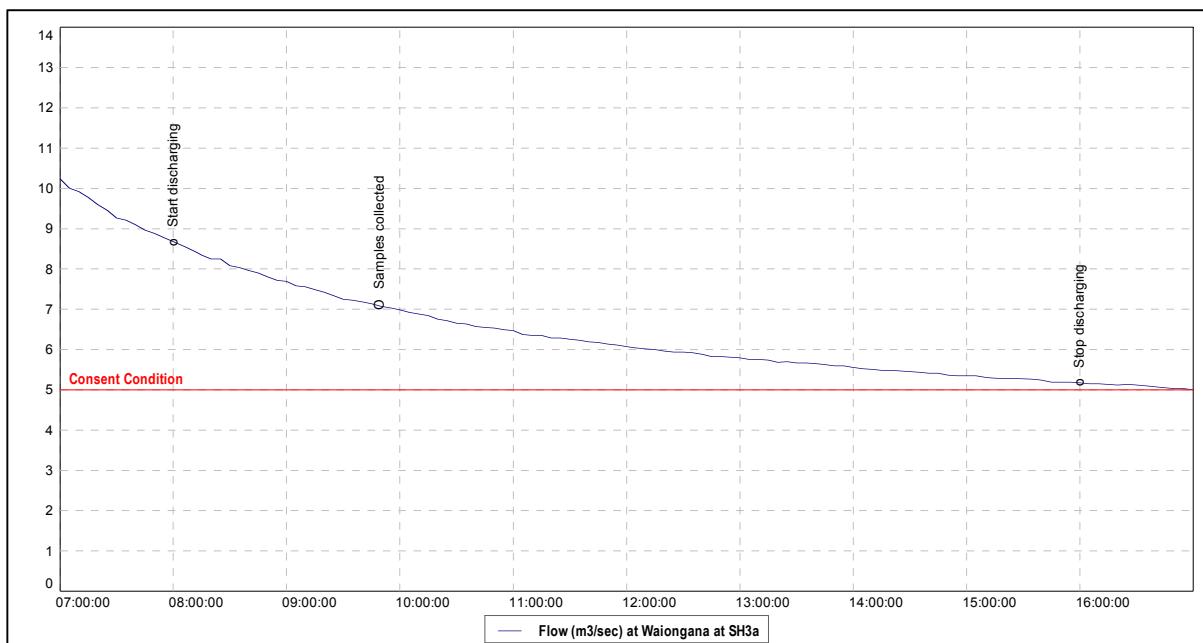
carbonaceous BOD_5 , which was well within the limit imposed by Special Condition 18. Generally, the discharge had minimal impact on the receiving water in terms of pH, conductivity, turbidity, and suspended solids at the boundary of the mixing zone. The visual assessment in relation to compliance with Special Condition 11(e) indicated no change in the visual clarity or colour of the receiving waters at the boundary of the mixing zone.

In general, the piggery pond treated wastewater quality at the time of the survey was similar to that previously recorded in terms of pH, conductivity and chloride levels. BOD_5 was the lowest recorded and total ammonia and suspended solids levels were the second to lowest.

However, the suspended solids concentration in the discharge, at 120 g/m^3 , exceeded the limit of 100 g/m^3 on the new consent by 20%. Reference to Figure 5 would indicate that a limit of 100 g/m^3 is not achievable by the current treatment system. This is addressed in section 3.1.

[Survey of 3 July 2017](#)

The consent holder advised the Council that the piggery discharge had commenced at approximately 0800 hours on the 3 July 2017. Wastewater and receiving water samples were collected approximately two hours after the commencement of the discharge of treated wastewater into the Waiongana Stream when the stream flow was approximately $7 \text{ m}^3/\text{s}$, in a slow receding fresh, and continued to discharge for a further six hours before ceasing when the flow had fallen to approximately $5.25 \text{ m}^3/\text{s}$.



[Figure 10 Flow data recorded for the Waiongana Stream for the duration of the piggery wastewater discharge commencing 3 Jul 2017 at 0800 hrs and finishing 3 Jul 2017 at 1600 hrs](#)

Samples were collected upstream, downstream and at the discharge point. The results of the samples analysed are provided in Table 6.

[Table 6 Results of the receiving water compliance survey of 3 July 2017](#)

Site		WGA000361	PGP002002	WGA000363	Consent
Parameter	Unit	Upstream	Discharge	50 m d/s	limit
Time	NZST	0940	0950	0955	
Temperature	°C	11.0	11.0	11.1	

Site		WGA000361	PGP002002	WGA000363	Consent
Parameter	Unit	Upstream	Discharge	50 m d/s	limit
Conductivity @ 20°C	mSm	6.3	270	7.3	
Chloride	g/m³	7.2	272	8.0	
pH	pH	7.4	8.0	7.4	
BOD ₅ (total)	g/m³	-	45	-	110 (discharge)
BOD ₅ (carbonaceous filtered)	g/m³	1.1	-	1.0	2.0 (d/s)
Ammoniacal nitrogen	g/m³N	0.137	214	0.755	
Un-ionised ammonia	g/m³N	0.0008	5.1446	0.0046	0.025 (d/s)
Dissolved reactive phosphorus	g/m³P	0.051	-	0.168	
Suspended solids	g/m³	27	160	27	100 (discharge)
Turbidity	NTU	20	70	19	
Appearance		Turbid, brown	Turbid, brown	Turbid, brown	

These results indicated that the dilution rate based on chloride values was approximately in excess of 1 part effluent to 330 parts receiving water and therefore in compliance with Special Conditions 15 and 16 at the time of sampling and should have remained in compliance throughout the period of discharge, assuming a steady discharge rate.

An increase of 0.618 g/m³ N in ammoniacal nitrogen did not result in non-compliance with the un-ionised ammonia limit imposed by Special Condition 20. There was no increase in filtered carbonaceous BOD₅, which was well within the limit imposed by Special Condition 20. Generally, the discharge had minimal impact in terms of pH, conductively, turbidity, and suspended solids at the mixing zone boundary.

A visual assessment in relation to Special Condition 11(e) 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 improved over that recorded since dairy wastes were removed from the treatment system (TRC 2013), with BOD, turbidity, and suspended solids levels well below the subsequent median values and ammoniacal N level slightly above the median.

Again, the suspended solids limit of 100 g/m³ was not achieved, being exceeded by 60%, though this had no measurable impact at the mixing zone boundary.

2.1.4 Treated effluent discharge records

The consent holder provides data on treated wastewater discharges to the Waiongana Stream upon request, or as required. This data is presented in Table 7 below.

Table 7 Discharge records of piggery treated wastes to the Waiongana Stream

Discharge date	Duration (approx. hours)	Stream flow above 5 m ³ /sec
14 July 2016	5	Yes
23-24 July 2016	26	Yes
2 August 2016	4	Yes
3-4 August	22	Yes

Discharge date	Duration (approx. hours)	Stream flow above 5 m ³ /sec
26 August 2016	14	Yes
27 August 2016	8	Yes
4-5 August 2016	13	Yes
16-18 August 2016	48	Yes
3 October 2016	5	Yes
25 October 2016	5	Yes
11 November 2016	7	Yes
25 November 2016	4	Yes
8 November 2016	8	Yes
2 January 2017	6	Yes
3-4 January 2017	24	Yes
19 January (sampled)	6	Yes
2 February 2017	9	Yes
17 February 2017	5	Yes
4-6 April 2017 (sampled)	58	Yes
11-13 May 2017	48	Yes
23 June 2017	17	Yes
Total discharge hours	342	

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 16 of Consent 0715-4.

The discharge records indicated that all discharges had occurred when the river flow was above the allowable 5 m³/s.

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 Council's HydroTel text messaging service and is notified automatically when the Waiongana Stream flow exceeds 5 m³/s (i.e. when discharge to stream is allowed) and again when the stream flow recedes back to minimum consent conditions.

The Council's telemetered hydrology station is approximately 4 km upstream from the piggery discharge point.

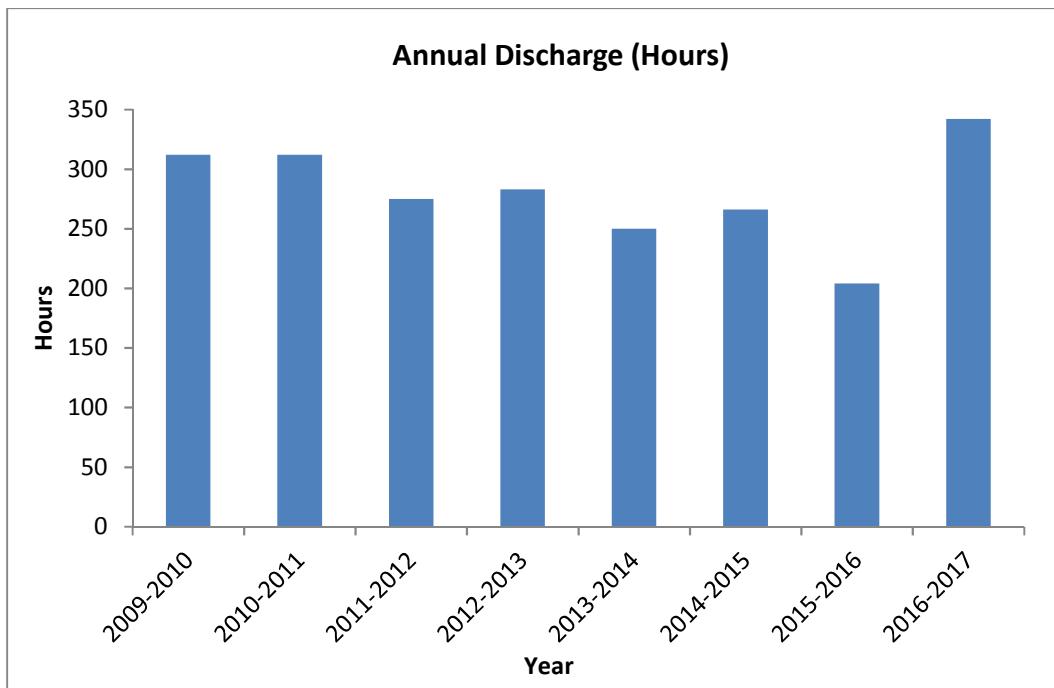


Figure 11 Yearly discharge hours

The average volume of wastewater discharged into the Waiongana Stream for the past eight years has been 14,137 m³ per annum (280.5 actual discharge hours x 14 L/sec discharge effluent flow).

For the 2016-2017 monitoring period there has been a significant increase in the volume of treated wastewater discharged into the Waiongana Stream. This may have been attributed to an unusually wet winter and spring period, resulting in high stormwater and low pond evaporation rates.

2.2 Air

2.2.1 Inspections

Air inspections were carried out in conjunction with all the general compliance monitoring inspections.

During the monitoring period 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, has had a significant effect in reducing odour.

Operations at the piggery had previously resulted in some odour travelling off site from the ponds system from time to time prior to installation of the covered anaerobic pond. As the piggery wastewater treatment ponds are located near a residential area in the Lepperton Township, there is no real buffer zone for odours that are a result of general piggery operations.

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 RMA 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 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.

2.3 Investigations, interventions, and incidents

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

The Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The incident register includes events where the 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 2016-2017 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with the Trust's Piggery in resource consents or provisions in Regional Plans.

3 Discussion

3.1 Discussion of site performance

In 2015, Consent 0715 was replaced to allow DH Lepper Trust to continue until 2026 to discharge treated piggery effluent from an oxidation pond treatment system into the Waiongana Stream during fresh (high flow) conditions, and to provide for disposal of the effluent to land through a spray irrigation system that is to be constructed during the term of the consent. The new consent requires that, within a five year period, approximately 40% of the treated effluent, which was being discharged entirely into the Waiongana Stream, be spray irrigated to land, and that full disposal to land then be investigated. Consent 5206 was changed to provide for the discharge of emissions to air from the impending application of effluent to land.

Consent 0715-4 limits the piggery to its existing size, in terms of 50 kg pig-equivalents requiring no more than 3,529 50 kg pig-equivalents. The consent also requires that the final effluent must be treated aerobically, for control of odour. An effluent irrigation system of minimum area 24.6 ha must be installed by June 2020, with discharge to land maximised and discharge to water minimised.

Under the two consents, the Trust is required to provide to Council for approval management plans on operation of the dual disposal system (Piggery Effluent Disposal Management Plan), protection of soil (Effluent Irrigation Management Plan), and control of odour (Odour Management Plan). Further, a Land Disposal Options Report, to detail the feasibility of disposing all of the effluent to land, is required to be provided by June 2021. The Effluent Plans and Options Report are to be provided to Fish and Game New Zealand for comment.

For the 2016-2017 period, records of pig numbers and effluent discharges were provided, as required. The piggery size was unchanged, although the limit on 50 kg pig equivalents was exceeded marginally, by 3.0%. All effluent was discharged to the Waiongana Stream. No discharge to land occurred, while preparations were made for construction of the land disposal system. The calculated volume of effluent discharged to Waiongana Stream was higher than usual, due largely to a wet spring. The Waiongana Stream flow was above the minimum rate required on each discharge occasion.

The piggery discharge was not shown to breach the receiving water limits on filtered carbonaceous BOD_5 or un-ionised ammonia on the three monitoring occasions, though the January 2017 survey indicated that upstream BOD_5 was fluctuating around the limit, while discharge was occurring. The minimum effluent dilution requirement was achieved in each survey.

The limit on effluent suspended solids concentration was breached on each monitoring occasion. An application from the consent holder to vary consent 0715-4 to remove this (new) limit has been received by Council, in recognition of the highly turbid state of the Waiongana Stream at times of effluent discharge.

Effluent carbonaceous BOD_5 exceeded the consent limit in January 2017, whereas the BOD_5 values from the last two surveys were the lowest recorded. The reason for the anomalous high value is not clear.

Progress with construction of the irrigation system was largely in accordance with the Implementation Plan submitted with the application for consent 0715-4. A pump shed was constructed beside the final aerobic pond, and a 500-metre electric cable was laid between the shed and the newly installed power transformer on Manutahi Road. Pipework for effluent reticulation was purchased. Commissioning of the first stage of the irrigation system is planned for 2017-2018, by which time the required Effluent, Irrigation and Odour Management Plans will have been produced, in combined form.

Inspections of the piggery found the production facility and effluent treatment system to be operated in accordance with best practice, with no significant generation of odour.

3.2 Environmental effects of exercise of consents

The discharge of wastewater to Waiongana Stream was not recorded to have any impact on visual clarity, either outside or inside the mixing zone, because of the highly turbid state upstream. Higher nutrient values for DRP and ammonia were recorded upstream of the discharge indicating a minor effect of the discharged receiving water quality. Given the high flow conditions and relatively small increase in nutrients, environmental effects of the discharge are considered to be negligible.

There is no biological monitoring associated specifically with the piggery discharge, as it occurs infrequently over short periods at times of high flow when there is a large amount of dilution. However, monitoring of benthic macroinvertebrates and of periphyton is carried out at sites upstream (8.0 km at State Highway 3A) and downstream (6.9 km at Devon Road) of the discharge point as part of regional state of the environment monitoring programmes. There is no indication that an individual point-source discharge is having a significant effect on Waiongana Stream. For the macroinvertebrates, MCI values have not changed significantly at either site over the last 10 years; the MCI values are within the 'fair' health category at both sites, with some deterioration in a downstream direction to a degree that is comparable to similar catchments around the ring plain over the same distance and change in elevation (TRC 2016). For periphyton, the indicative trend is that bed cover is decreasing at the upstream site and increasing at the lower site, with the (TRC) Periphyton Index score reducing in a downstream direction from 'good' to 'moderate' (TRC 2016a). Algal biomass (chlorophyll a) varies widely between years at both sites, with occasional high levels, unrelated to flow; insufficient data have yet been collected to determine temporal trends.

There is no indication that any individual point-source discharge is having a significant effect on the ecology of Waiongana Stream, though the combined effect of several farm oxidation pond discharges is likely to have an impact. For this reason, Council has signalled to farmers of the region that, as a general rule, farm effluent must be discharged to land (TRC 2017). It is noted that Consent 0715-4 was drafted to provide for the establishment of a dual land/water effluent disposal system, with the objective of progressively increasing the proportion discharged to land, and a requirement to investigate discharge completely to land, thereby reducing and potentially eliminating any environmental effects on the stream.

No application of wastewater to land occurred during the review period. Particular care will be required during initial operation of the spray irrigation system to ensure that discharge does not occur when the wind is blowing towards residential areas.

In regard to air emissions from the piggery and effluent treatment system, there were no incidents related to odours beyond the site boundary. Inspections by Council found local odour around the effluent drains and collection area.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Tables 8-10.

Table 8 Summary of performance for consent 0715-4.0

Purpose: To discharge treated piggery effluent to land and water from an oxidation pond treatment system		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Maximise discharge to land and minimised discharge to water	Monitoring inspections	No – all effluent discharged to water. Work in progress to establish land application system
2. Effluent generated from allowable pig numbers	Monitoring inspections and consent holder data	No, minor exceedance
3. Adopt best practical option to minimise environmental effects	Monitoring inspections	Yes
4. Effluent treated via appropriate pond system	Monitoring inspections and sampling	Yes
5. Discharge from the aerobic ponds only	Monitoring inspections	Yes
6. No overflows from the effluent disposal system	Monitoring inspections	Yes
7. Provide sufficient storage for effluent	Monitoring inspections	Yes
8. Minimise solids from first to second pond	Monitoring inspections and sampling	Yes
9. Operation and discharge in accordance with consent	Monitoring inspections and sampling	Yes
10. Maintain records of discharge to land and water	The consent holder to provide when requested by Council	Yes
11. Consent to be exercised in accordance of the Piggery Effluent Disposal Plan	Plan to be submitted to Council	No, plan being prepared
12. Consent to be exercised in accordance with the Effluent Irrigation Management Plan	Plan to be submitted to Council	No, plan being prepared
13. Land Disposal Options Report	The consent holder to provide by 1 June 2021	N/A
14. All plans and reports to be supplied to Fish and Game	In progress	In progress
15. Discharge rate not to exceed 16 L/sec	Monitoring inspections	Yes

Purpose: To discharge treated piggery effluent to land and water from an oxidation pond treatment system		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
16. Discharge only when river conditions allow	Consent holder's discharge records and monitoring	Yes
17. Location of discharge point	Monitoring inspections	Yes
18. Maximum concentrations in effluent	Monitoring inspections and sampling	No, breaches on BOD (once) and suspended solids
19. Clear and safe access sampling point	Monitoring inspections	Yes
20. Maximum concentrations in receiving water	Monitoring inspections and sampling	Yes
21. Even effluent application to land	Discharge to land progressively over a 5 year period	N/A
22. No effluent ponding on land	Discharge to land progressively over a 5 year period	N/A
23. Limits on potassium applied to land	Discharge to land progressively over a 5 year period	N/A
24. Limits on total nitrogen applied to land	Discharge to land progressively over a 5 year period	N/A
25. No discharge within 25 m of surface water	Discharge to land progressively over a 5 year period	N/A
26. Notification of unauthorised effluent discharge	Monitoring and self notification	Yes
27. Review of consent	Next consent review June 2021	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		Good
Overall assessment of administrative performance in respect of this consent		Good

N/A = not applicable

Table 9 Summary of performance for consent 5206-2.1

Purpose: 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. Total allowable number of pigs on site	Monitoring inspections & consent holder records	No, minor exceedance
2. Adopt best practical option to minimise adverse effects on the environment	Monitoring inspections & consent review process	Yes

Purpose: 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?
3. Consultation and approval prior to alterations to plant and equipment	Monitoring inspections & consent review process	Yes
4. Minimisation emissions and impacts	Monitoring inspections	Yes
5. Offensive objectionable odour at site boundary not permitted	Monitoring inspections	Yes
6. Deemed objectionable odour to be offensive	Monitoring inspections	Yes
7. Odour management plan	Plan to be submitted to Council.	No, plan being prepared
8. Review of consent conditions	Next consent review 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		Good

N/A = not applicable

Table 10 Summary of performance for consent 0811-3

Purpose: 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?
1. Minimise environmental effects	Monitoring inspections	Yes
2. Water abstraction not to exceed 50% of the stream flow	Monitoring inspections	Yes
3. Optional review of consent	No further reviews	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

During the year, the Trust demonstrated a Good level of environmental and a Good level of administrative performance with the resource consents as defined in Section 1.1.4.

Breaches of the limit on effluent suspended solids concentration are being addressed through an application to vary consent 0715-4.

Required Management Plans relating to effluent, irrigation and odour were not provided in completed form, though draft plans were followed in operation of the piggery. A combined Management Plan is in preparation.

3.4 Recommendations from the 2015-2016 Annual Report

In the 2015-2016 Annual Report, it was recommended:

THAT monitoring of consented activities at DH Lepper Trust Piggery in the 2016-2017 year continues at the same level as in 2015-2016 period except where noted below.

1. 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 5 m³/sec.
2. THAT the consent holder discharge to land is maximised and the discharge to water is minimised.
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 provides a 'Piggery Effluent Disposal Management Plan' (the 'Management Plan') as requested by Council in support of Consent 0715-4 application process.
5. THAT the consent holder provides an 'Odour Management Plan' as requested by Council in support of Consent 5206-2 (change to consent conditions) application process.

Recommendation 1 was achieved. The consent holder notified Council as arranged in order for the Council to take water quality samples from the stream as required.

Recommendation 2 was achieved. The consent holder had made significant progress to establish discharge to land.

Recommendation 3 was achieved. All 20 separate discharge occasions to the Waiongana Stream show that the stream was at or above the allowable 5 m³/s.

Recommendations 4 and 5 were partially achieved. Components of the piggery Effluent Disposal and Odour Management Plan have been provided and will require further input once discharge to land commences.

3.5 Alterations to monitoring programmes for 2017-2018

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

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

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

In the case of DH Lepper Trust Piggery monitoring programme, it is proposed that for the 2017-2018 period, monitoring continues as set out in the 2016-2017 compliance monitoring programme except where noted in the recommendations

With the commencement of irrigation to land in 2017-2018, provision is made for additional inspection, should a problem arise with odour. Also, given that the conditions on consent 0715-4 impose limits on nitrogen and potassium loadings on irrigation areas, those components in the effluent shall be monitored.

The frequency of sampling the discharge to Waiongana Stream, at tri-annual, is high in comparison to similar discharges in the region. Considering the reducing volume of discharge to the stream, and the difficulty in coordinating sampling when discharges are sporadic and often of short duration, the frequency of sampling can be reduced to biannual.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site(s) in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2017-2018.

4 Recommendations

1. THAT in the first instance, monitoring of consented activities at D H Lepper Trust Piggery in the 2017-2018 year continue at the same level as in 2016-2017 period except where noted below.
2. THAT should there be issues with environmental or administrative performance in 2017-2018, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the consent holder continues to advise the Council of treated wastewater discharges to the Waiongana Stream to enable the Council to collect water quality samples as required and to maintain a discharge only when the Waiongana Stream flow rate is above the allowable 5 m³/sec.
4. That the frequency of Inspections in the 2017-2018 monitoring programme continue at three per year, with provision for a further inspection to be performed.
5. That the frequency of sampling of the discharge and receiving waters be reduced to two occasions per year, with provision for an extra sample run to be performed if required.
6. That the effluent be monitored for nitrogen and potassium for the purpose of determining loadings in application of effluent to land.

Glossary of common terms and abbreviations

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

BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
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.
COD	Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m.
Cu*	Copper.
Cumec	A volumetric measure of flow- 1 cubic metre per second ($1\text{ m}^3\text{s}^{-1}$).
DO	Dissolved oxygen.
DRP	Dissolved reactive phosphorus.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
g/m ² /day	Grams/metre ² /day.
g/m ³	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
Incident Register	The Incident Register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
L/s	Litres per second.
m ²	Square metres.
MCI	Macroinvertebrate community index; a numerical indication of the state of 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.
pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.
Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment.
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	<i>Resource Management Act 1991</i> and including all subsequent amendments.
SS	Suspended solids.
Temp	Temperature, measured in °C (degrees Celsius).
Turb	Turbidity, expressed in NTU.

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

Bibliography and references

- Taranaki Regional Council 2017 Taranaki Regional Council Requirements for good farm management in Taranaki, March 2017
- Taranaki Regional Council 2016b DH Lepper Trust Piggery Monitoring Programme Annual Report 2015-2016 Technical Report 2016-95
- Taranaki Regional Council 2016a Freshwater Periphyton Monitoring Programme (Periphyton monitoring in relation to amenity values) State of Environment Monitoring Report 2014-2016 Technical Report 2016-34
- Taranaki Regional Council 2016 Freshwater Macroinvertebrate Fauna Biological Monitoring Programme Annual State of Environment Monitoring Report 2015-2016 Technical Report 2016-33
- Taranaki Regional Council 2015 DH Lepper Trust Piggery Monitoring Programme Annual Report 2014-2015 Technical Report 2015-64
- Taranaki Regional Council 2014 DH Lepper Trust Piggery Monitoring Programme Annual Report 2013-2014 Technical Report 2014-28
- Taranaki Regional Council 2013 DH Lepper Trust Piggery Monitoring Programme Annual Report 2012-2013 Technical Report 2013-03
- Taranaki Regional Council 2012 DH Lepper Trust Piggery Monitoring Programme Annual Report 2011-2012 Technical Report 2012-33
- Taranaki Regional Council 2011 DH Lepper Trust Piggery Monitoring Programme Annual Report 2010-2011 Technical Report 2011-34
- Taranaki Regional Council 2010 DH Lepper Trust Piggery Monitoring Programme Annual Report 2009-2010 Technical Report 2010-12
- Taranaki Regional Council 2009 DH Lepper Trust Piggery Monitoring Programme Annual Report 2008-2009 Technical Report 2009-34
- Taranaki Regional Council 2008 DH Lepper Trust Piggery Monitoring Programme Annual Report 2007-2008 Technical Report 2008-16
- Taranaki Regional Council 2007 DH Lepper Trust Piggery Monitoring Programme Annual Report 2006-2007 Technical Report 2007-50
- Taranaki Regional Council 2006 DH Lepper Trust Piggery Monitoring Programme Annual Report 2005-2006 Technical Report 2006-61
- Taranaki Regional Council 2005 DH Lepper Trust Piggery Monitoring Programme Annual Report 2004-2005 Technical Report 2005-24
- Taranaki Regional Council 2004 DH Lepper Trust Piggery Monitoring Programme Annual Report 2003-2004 Technical Report 2004-79
- 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

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 DH Lepper Trust Piggery

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

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

Name of
Consent Holder: Lepper D H Trust
S Lepper
326 Wortley Road
R D 9
INGLEWOOD

Consent Granted 9 January 2002
Date:

Conditions of Consent

Consent Granted: To take up to 75 cubic metres/day [0.9 litres/second] of water from an unnamed tributary of the Waiongana Stream for piggery operation purposes at or about GR: Q19:145-366

Expiry Date: 1 June 2020

Review Date(s): June 2008, June 2014

Site Location: Manutahi Road, RD 3, New Plymouth

Legal Description: Pt Sec 185 & 186 Huirangi Dist Blk VII Paritutu SD

Catchment: Waiongana

General conditions

- a) That on receipt of a requirement from the Chief Executive, Taranaki Regional Council (hereinafter the Chief Executive), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
 - i) the administration, monitoring and supervision of this consent; and
 - ii) charges authorised by regulations.

Special conditions

1. 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 from the unnamed tributary in the Waiongana Stream catchment, including, but not limited to, the efficient and conservative use of water.
2. That abstraction shall not exceed 50% of the natural stream flow at any time.
3. The Taranaki Regional Council may review, according to section 128 of the Resource Management Act 1991, any or all of the conditions of this consent by giving notice of review during June 2008 and/or June 2014, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this consent, which either were not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 9 January 2002

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: DH Lepper Trust
(Trustees: Steven Maxwell Lepper & Paul Robert Franklin)
326 Wortley Road
RD 9
Inglewood 4389

Decision Date (Change): 8 September 2015

Commencement Date (Change): 29 September 2015 (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 system, effluent application to land and other waste management activities

Expiry Date: 1 June 2026

Review Date(s): June 2016, June 2020

Site Location: Mountain Road, Lepperton

Legal Description: Pt Lot DP 2634 Sec 185 Huirangi Dist Blk VII Paritutu SD
Lot 3 DP 21006 (Discharge source & site)

Grid Reference (NZTM) 1703992E-5675964N (Land & air)
1704041E-5674835N (Air)

*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 3529 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. 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.
4. 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.
5. The discharges authorised by this consent shall not give rise to an odour at or beyond the property boundary that is offensive or objectionable.

6. For the purposes of condition 5, 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:
 - i. the individuals' names and addresses;
 - ii. the date and time the objectionable or offensive odour was detected;
 - iii. details of the duration, frequency, intensity and nature of the odour that cause it to be considered offensive or objectionable;
 - iv. the location of the individual when it was detected; and
 - v. the prevailing weather conditions during the event.
7. Prior to any discharge in accordance with consent 0715-4, the consent holder shall provide an Odour Management Plan which details to the satisfaction of the Chief Executive of Taranaki Regional Council how odorous emissions beyond the property boundary will be minimised. The plan shall include:
 - (a) A definition of the environmental effects being managed by the plan and the objective sought in relation to this effect;
 - (b) Identify key personnel responsible to managing the effect;
 - (c) Describe the activities on the site and describe the main potential sources of odour emissions;
 - (d) Identify and describe methods of mitigation and operating procedures including the dewatering of the anaerobic pond or during control contingency discharge events;
 - (e) 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.

8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 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 8 September 2015

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of Consent Holder: DH Lepper Trust
(Trustees: Steve Maxwell Lepper & Paul Robert Franklin)
326 Wortley Road
RD 9
Inglewood 4389

Decision Date: 8 September 2015

Commencement Date: 29 September 2015

Conditions of Consent

Consent Granted: To discharge treated piggery effluent from an oxidation pond treatment system to land and into the Waiongana Stream during fresh (high flow) conditions

Expiry Date: 1 June 2026

Review Date(s): June 2017, June 2021, June 2023

Site Location: Manutahi Road, Lepperton

Legal Description: Pt Lot 2 DP 2634 Sec 185 Huirangi Dist Blk VII Paritutu SD
(Discharge source & site)

Grid Reference (NZTM) 1704471E-5676221N (Water)
1703992E-5675964N (Land)

Catchment: Waiongana

*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 shall be exercised in a manner that ensures, to the greatest extent practicable, the discharge of treated effluent to land is maximised and the discharge to water minimised.
2. The effluent discharged shall be from piggery of no more than 3529 (50 kg) pig equivalents.
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 of the discharge on the environment.
4. All effluent generated at the piggery site shall be treated in a system of oxidation ponds, involving at least one anaerobic pond and two aerobic ponds.
5. Any discharge shall be from the aerobic pond on site.
6. There shall be no overflow of effluent from any part of the effluent disposal system.
7. The consent holder shall ensure that at all times, while complying with the other requirements of this consent, there is sufficient storage available in the effluent treatment system for any reasonably likely inflow, so that there is no unauthorised discharge to land or water.
8. A flow control structure, such as a 'tee-piece' pipe or other baffle system that achieves the same outcome, shall be maintained and operated on the outlet of the first oxidation pond so as to minimise the movement of solids from the pond.
9. The effluent treatment system and disposal system shall be operated and maintained to ensure compliance with the conditions of this consent. Operation and maintenance shall include as a minimum:
 - (a) vegetation control on and around the storage facility;
 - (b) desludging;
 - (c) ensuring that there is adequate freeboard in ponds to allow for contingencies such as a pipe blockage; and
 - (d) cleaning, repairing and generally ensuring the integrity of the:
 - (i) irrigator;
 - (ii) stormwater diversion;
 - (iii) sand trap;
 - (iv) piping;
 - (v) pump(s);
 - (vi) pond wall; and
 - (vii) fences.

10. The consent holder shall keep accurate records of effluent application to land and water, including, as a minimum, the:

- (a) type of effluent (e.g. solid, liquid);
- (b) volume of effluent applied;
- (c) rate and duration of application;
- (d) loading of potassium and nitrogen over the discharge area;
- (e) paddock and area (ha) that the effluent was applied to;
- (f) date the paddock received effluent;
- (g) wind direction;
- (h) any odour from the land application;
- (i) any complaints received, including dates and times; and
- (j) date, duration (start and finish times), rate and volume of the discharge to the Waiongana Stream.

This information shall be provided to the Taranaki Regional Council upon request.

11. From 1 November 2016 and subject to the other conditions of this consent, this consent shall be exercised in accordance with a *Piggery 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 how the consent holder will manage the dual discharge to ensure that adverse environmental effects are avoided as far as practical, and consent conditions are met and can be shown to be met. It shall address as a minimum:

- (a) methods and procedures for maximising the discharge of contaminants to land;
- (b) methods and procedures for minimising the discharge of contaminants to the Waiongana Stream;
- (c) the staged implementation of the discharge to land, including the amount of discharge and area of land for disposal at each stage;
- (d) monitoring the quality and rate of the discharge;
- (e) monitoring the quality and flow of the Waiongana Stream;
- (f) management of the wastewater treatment system;
- (g) minimisation of potassium, nitrogen and phosphorus in the wastewater discharge and how this is being achieved;
- (h) methods for determining the amount of nitrogen and potassium discharged to land; and
- (i) reporting on the exercise of the consent.

12. From 1 November 2016, and subject to the other conditions this consent, this consent shall be exercised in accordance with an Effluent Irrigation Management Plan ('EIMP') that has been approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The EIMP shall detail how the application of effluent will be managed to ensure that the soil moisture deficit is not exceeded on high risk soils or soils with slopes of more than 7 degree and effluent will be retained in the top 300 mm for low risk soils including, as a minimum, details of:
 - (a) area(s) to be irrigated and the method of irrigation;
 - (b) evapotranspiration and available water holding capacity of the soil(s) over the irrigated area;
 - (c) how irrigation will be scheduled to maximise the benefits of evapotranspiration and minimise subsurface drainage;
 - (d) how available soil water will be determined;
 - (e) how water is to be applied as uniformly as practicable over the irrigated area, and the uniformity of application demonstrated; and
 - (f) information to be provided to the Taranaki Regional Council to enable compliance to be checked.

Note: The 'Effluent Irrigation Management Plan' may be combined with the 'Piggery Effluent Disposal Management Plan' required by condition 11.

13. Before 1 June 2021, the consent holder shall provide a *Land Disposal Options Report* (LDOR) to the Chief Executive, Taranaki Regional Council. The purpose of the LDOR is to detail the feasibility of disposing all of the effluent to land. The report will include, as a minimum:
 - (a) details of the proportion of contaminants that have been discharged to land to date;
 - (b) a general assessment of the efficacy of land disposal based on experience at the site taking into account such matters as cost and environmental benefits;
 - (c) an assessment of the land area that would be needed to dispose of all the effluent to land; and
 - (d) identification of specific areas of land that could be used for expanded land disposal.
14. Plans and reports submitted to the Chief Executive, Taranaki Regional Council in accordance with conditions 11, 12 and 13 shall also be provided to Fish and Game New Zealand at the same time. Any comments made by Fish and Game New Zealand within 15 working days of receiving a plan or report may be taken into account by the Chief Executive, Taranaki Regional Council when determining if the plan or report meets the requirements of this consent.

Discharge to water conditions

15. The rate of the discharge to water shall not exceed 16 litres/second.
16. The discharge from the pond 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 cubic metres per second.
17. The discharge point into the Waiongana Stream shall be located at (NZTM) 1704471E-5676221N. This point of discharge shall be beneath the surface of the receiving water.

18. After treatment in the aerobic pond, the maximum concentration of the constituents shown in the table below shall not be exceeded in the effluent.

Constituent	Maximum Concentration
Total carbonaceous BOD ₅	110 gm ⁻³
Suspended solids	100 gm ⁻³

19. The consent holder shall ensure that there is always clear and safe access to a point where the effluent from the final pond can be sampled.
20. The discharge shall not cause the maximum concentration of any constituent shown in the following table to be exceeded in the receiving water more than 50 metres downstream of the discharge to the receiving water.

Constituent	Maximum Concentration
Unionised ammonia	0.025 gm ⁻³
Filtered carbonaceous BOD ₅	2.0 gm ⁻³

Discharge to land conditions

21. From 1 June 2020, the consent holder shall ensure that effluent application to land is as evenly as practicable over an area of no less than 24.6 hectares.
22. Discharges to land shall not result in effluent ponding on the surface that remains for more than 30 minutes.
23. Over any 12 month period the amount of potassium (K) applied to land as a result of the discharge shall not exceed 100 kg per hectare.
24. Over any 12 month period the amount of Total Nitrogen (N) applied to land as a result of the discharge shall not exceed 200 kg per hectare.
25. The discharge authorised by this consent shall not occur within 25 metres of any surface water body.
26. Where, for any cause (accidental or otherwise), untreated or partially treated effluent associated with the consent holder's operations escapes to surface water, the consent holder shall:
- immediately notify the Taranaki Regional Council on Ph. 0800 736 222 (notification must include either the consent number or farm dairy number); and
 - stop the discharge and immediately take steps to control and stop the escape of untreated or partially treated effluent to surface water; and
 - immediately take steps to ensure that a recurrence of the escape of untreated or partially treated effluent to surface water is prevented; and
 - report in writing to the Chief Executive, Taranaki Regional Council, describing the manner and cause of the escape and the steps taken to control it and to prevent it reoccurring. The report shall be provided to the Chief Executive within seven (7) days of the occurrence.

Consent 0715-4.0

27. 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 2021 and/or June 2023, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time, including consideration, following receipt of the report required by condition 13, of the feasibility of expanding the irrigation area to dispose of all effluent to land.

Signed at Stratford on 8 September 2015

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management