

DH Lepper Trust (Piggery)  
Monitoring Programme  
Annual Report  
2019-2020

Technical Report 2020-79

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Taranaki Regional Council  
Private Bag 713  
STRATFORD  
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## Executive summary

DH Lepper (the Trust) operates a 'farrow to finish' piggery breeding and fattening unit situated on Mountain Road Lepperton, in the Waiongana catchment. The facility includes a solids composting process and an anaerobic biogas digester that generates about half of the total electricity usage for the site. Effluent from the piggery is now largely irrigated to land, a recent innovation in effluent management on the site.

The Trust holds two consents-to discharge treated effluent to land and to the river during periods of high flows, and to discharge emissions to air.

**During the monitoring period, D H Lepper Trust (piggery) demonstrated an overall high level of environmental performance.**

The Council's monitoring programme for the year under review included three inspections, and the collection of water and effluent samples from the Waiongana Stream and final treatment pond discharge respectively.

The monitoring showed that the piggery was having little, if any, effect on the Waiongana Stream and surrounding environment. There were no unauthorised incidents recording non-compliance in respect of the Trust during the period under review.

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

For reference, in the 2019-2020 year, consent holders were found to achieve a high level of environmental performance and compliance for 81% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 17% of the consents, a good level of environmental performance and compliance was achieved.

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

This report includes recommendations for the 2020-2021 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 2019 to June 2020 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by DH Lepper (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 discharges of treated piggery effluent to water and land within the Waiongana catchment, and the air discharge permit held by the Trust to cover emissions to air from the site.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of the Trusts use of water, land and air, and is the 16<sup>th</sup> 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 in the Trust's site/catchment.

**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 2020-2021 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 them a rating for their environmental and administrative performance during the period under review.

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. Administrative performance is concerned with the 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 environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

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

For example:

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



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

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

### Administrative performance

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

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

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

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

For reference, in the 2019-2020 year, consent holders were found to achieve a high level of environmental performance and compliance for 81% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 17% of the consents, a good level of environmental performance and compliance was achieved.

## 1.2 Process description

The Trust operates a 'farrow to finish' piggery breeding and fattening unit. The approximate weights and numbers of the pigs are shown in Table 1 and the location of the piggery, land and wastewater treatment system within the Lepperton Township are 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 2020

Type of pigs	No of pigs	Average weight kg	Total weight kg	50 kg Equivalent pigs
Sows	320	220	70,400	1,408
Gilts	55	150	8,250	165
Finishers	722	60	43,320	866
Growers	495	48	23,760	475
Stores	501	26	13,026	261
Weaners ( 5 – 8 weeks)	789	12	9,468	189
Suckers	706	2.5	1,765	35
Boars	10	250	2,500	50
<b>Total</b>	<b>3,598</b>			<b>3,449</b>

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 channeled 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 pond. The biogas (approximately 200 m<sup>3</sup> 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.

The consent holder discharges treated water from the final aerobic pond to land via spray irrigation or periodically during high river flows, into the neighbouring Waiongana Stream in compliance with the conditions of Consent 0715-4.1.

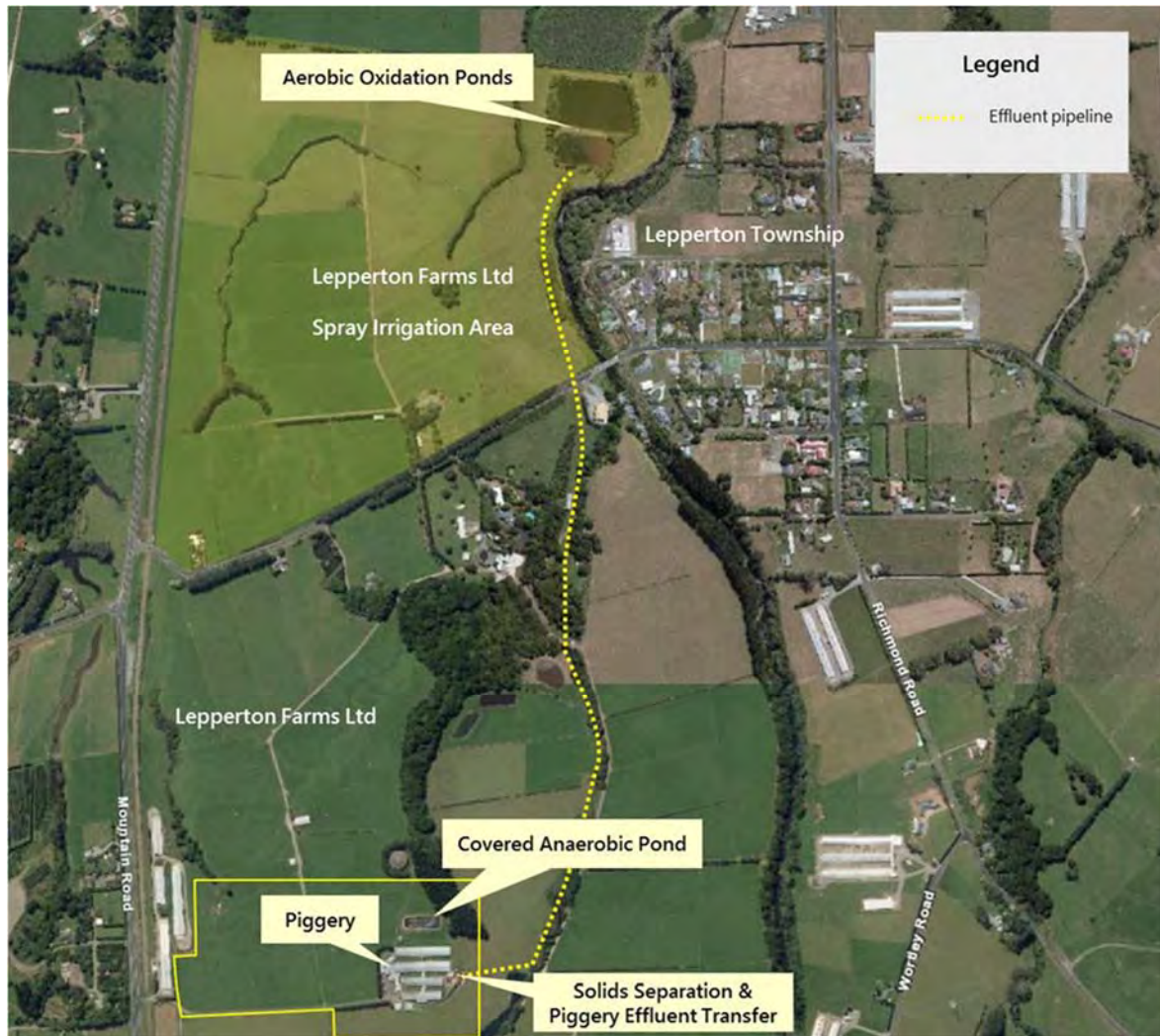


Figure 1 Location of DH Lepper Trust piggery, oxidation ponds, and Lepperton Township

### 1.3 Resource consents

The Trust held three resource consents, the details of which are summarised in the table below.

Table 2 Summary of consents held by the DH Lepper Trust piggery

Consent number	Purpose	Granted	Review	Expires
<i>Water Use Permits</i>				
0188-3	To take water from an unnamed tributary of the Waiongana Stream for piggery operation purposes.	9 Jan 2001	N/A	1 June 2020 Transferred to permitted activity
<i>Discharge Permits</i>				
0715-4.1	To discharge treated piggery effluent from an oxidation pond system to land and into the Waiongana Stream during high flow conditions.	29 Sep 2015	June 2021	1 June 2026
5206-1	To discharge emissions to air from a piggery operation and associated practices.	29 Sep 2015	June 2020	1 June 2026

## 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 piggery 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;
- 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 site was visited three times during the monitoring period. With regard to consents for the discharge to water or land, 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. This included the commencement of the first stage of the spray irrigation to land, which required an Irrigation and Odour Management Plan prior to commencement. Sources of data being collected by the Trust 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.

### 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 two occasions, and the samples analysed for conductivity, chloride, turbidity, suspended solids, BOD<sub>5</sub> (total carbonaceous), and temperature. The discharge was also analysed for nitrogen and potassium on both of the occasions to determine the nutrient value for land irrigation purposes. The Waiongana Stream, upstream and downstream of the discharge point, was sampled on two occasions, and the samples analysed for conductivity, chloride, turbidity, suspended solids, BOD<sub>5</sub> (filtered carbonaceous), ammonia-N, DRP and temperature.

The locations of the water sampling locations are illustrated in Figure 2 and detailed in Table 3. 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.

Table 3 Location of sampling sites in the Waiongana Stream

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



Figure 2 Location of sampling sites

## 2 Results

### 2.1 Water

#### 2.1.1 Inspections

5 November 2019

The washdown effluent flow from the piggery sheds was flowing directly to the discharge sump. It was noted that some swales beneath the piggery sheds were leaking, although appeared to be contained, with no seepage flowing onto the grassed areas between the sheds.

The contra sheer solids removal unit was not operating. The grunt bins were low and several bags were ready for sale.

The anerobic pond cover was partially filled with methane and the generator was running.

Odour was noted near the levelling sump area. There may have been a small pin hole leak coming from off the cover near the n/w corner of the pond.

Effluent samples were collected from off the sampling bridge adjacent to the discharge pumps. Stream samples were also collected on this occasion to verify non discharge conditions.

Very light odour was distinguishable around the pond perimeter although no odour was noted around the Lepperton Township.

Piggery effluent had not been spray irrigated to pasture as the final pond had ample of freeboard.

The land irrigation programme was planned to commence again when the weather improved. Additional irrigation lines were also planned to be installed.

12 March 2010

Visual inspection undertaken to assess compliance with air and water discharge consents. The inspection found that all piggery effluent was directed into the central collection point then the solids separator. From here it was directed into a covered anaerobic pond where the biogas was used to power a generator. The effluent from the covered anaerobic pond was gravity feed into two more ponds near Lepperton. The ponds were not discharging at the time of inspection. Pond one and two were quite low and no discharge to land had occurred recently. An odour survey was conducted. Very little odour was being generated onsite and there was no odour detected offsite. The site was compliant at the time of inspection.

8 May 2020

Visual inspection undertaken to assess compliance with air and land/water discharge consents. The inspection found that there was very little odour on site and no odour was emanating off site. The oxidation pond level was low and no discharge was occurring. No over flow was evident from any part of the effluent system. No issues were noted and the site was found to be compliant at the time of inspection.

### 2.1.3 Wastewater trends over time

Wastewater quality data recorded for the piggery treatment system between May 2011 and June 2020 have been summarised in the table<sup>1</sup> below. This covers the period since dairy wastes were removed from the system.

Table 4 Summary of the treated wastewater analysis results 2011 - 2020

Parameter	Unit	Number of samples	Range	
Conductivity @ 25°C (June 2018)	mS/m	4	245	340
Conductivity @ 20°C (2011-2018)	mS/m	23	212	313
pH	pH	27	7.7	8.3
Carbonaceous BOD <sub>5</sub>	gO <sub>2</sub> /m <sup>3</sup>	27	35	240
Ammoniacal nitrogen	g/m <sup>3</sup> N	20	72	367
Turbidity	NTU	27	18	530
Suspended solids	g/m <sup>3</sup>	27	86	350
Chloride	g/m <sup>3</sup>	26	235	408
Total nitrogen (N)	g/m <sup>3</sup> N	10	98	289
Total phosphorus (P)	g/m <sup>3</sup> P	5	50	70
Potassium (K)	g/m <sup>3</sup>	10	210	288

Trends in various parameters are graphed in the following figures: Figure 3 – Figure 7.

A marked improvement in terms of median wastewater concentrations were apparent for carbonaceous BOD<sub>5</sub> (Figure 3) and suspended solids (Figure 6) following the removal of dairy wastes from the treatment system, although the concentrations for the parameters remain typical of piggery pond treated wastewater which is particularly high in nutrient levels.

For context with respect to the these nutrient levels, sampling of the final aerobic pond wastewater discharge for nutrients was carried out on ten separate occasions during 2013-2020 monitoring period. This was undertaken to evaluate the following nutrients: nitrogen (N), phosphorus (P) and potassium (K) when spray irrigation of effluent to land commenced.

More recently the nitrogen, potassium and phosphorus nutrient levels have continued to be evaluated as spray irrigating treated effluent to land has now commenced.

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<sup>1</sup> May 2011-June 2018 (conductivity @ 20°C) and June 2018 - 2020 (conductivity @ 25°C)

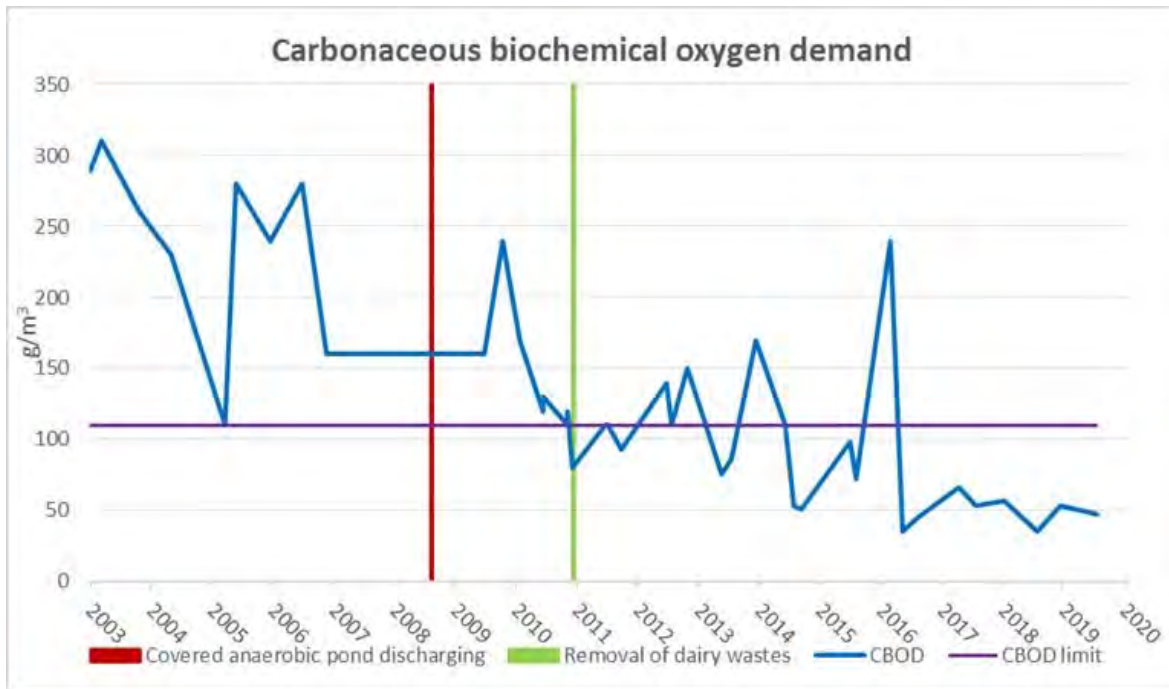


Figure 3 Wastewater carbonaceous biochemical oxygen demands levels, g/m<sup>3</sup> 2003-2020

Since the wastewater system upgrade in 2008 and the removal of dairy shed effluent in 2011 the observed CBOD concentrations in the discharge have been steadily decreasing. The odd spike, as seen in 2016 has been reported. Results from the 2019-2020 monitoring period indicate a slight decreasing concentration trend as shown in Figure 3<sup>2</sup>.

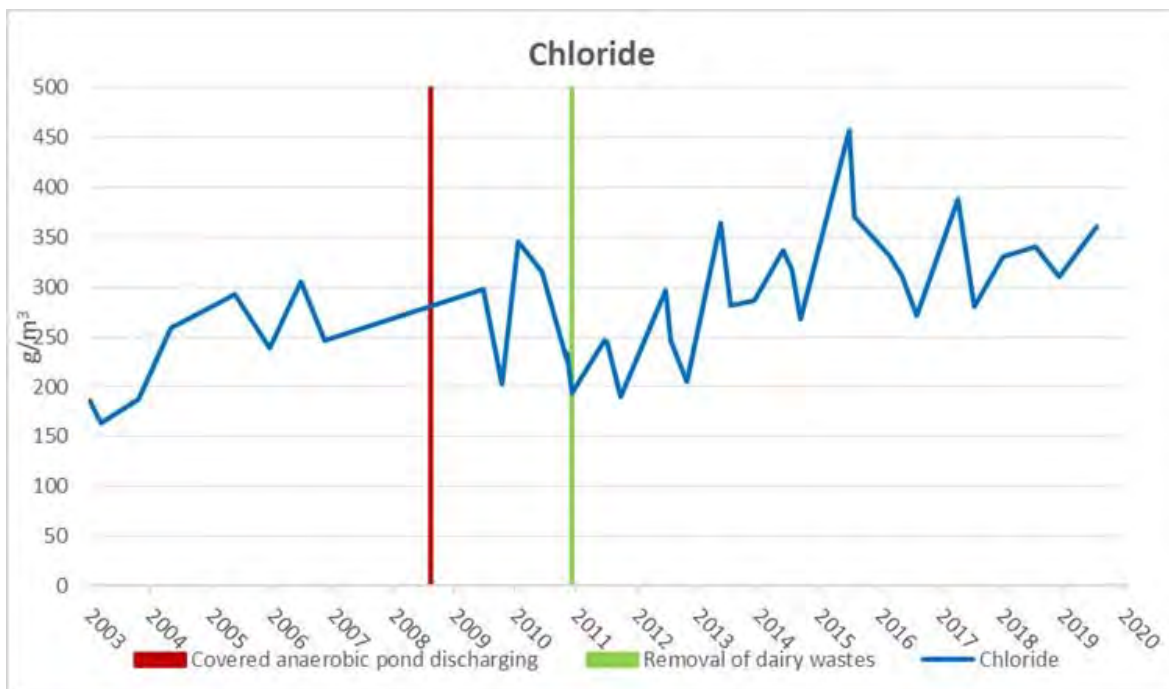


Figure 4 Wastewater chloride levels, g/m<sup>3</sup>, 2003-2020

<sup>2</sup> Note that the CBOD level of 110 g/m<sup>3</sup> has recently been removed from the consent conditions



Chloride levels (Figure 4) have since 2011 increased. However, since the 2015-2016 monitoring period, the results may indicate a slight plateau in values. Further analysis over time will allow a greater understanding of this analyte.



Figure 5 Wastewater conductivity measurements mS/m 2003-2019 at 25°C

Conductivity<sup>3</sup> measurements appear to be stable over time as observed in Figure 5.

<sup>3</sup> In June 2018 a change in laboratory provider occurred, resulting a slight change to the units used for conductivity. In this graph, the units mS/m at 25°C are used, and all previous results have been converted to this unit. Therefore, there may be differences between conductivity data presented in the current report when compared with reports prior to the 2019-2020 monitoring year.

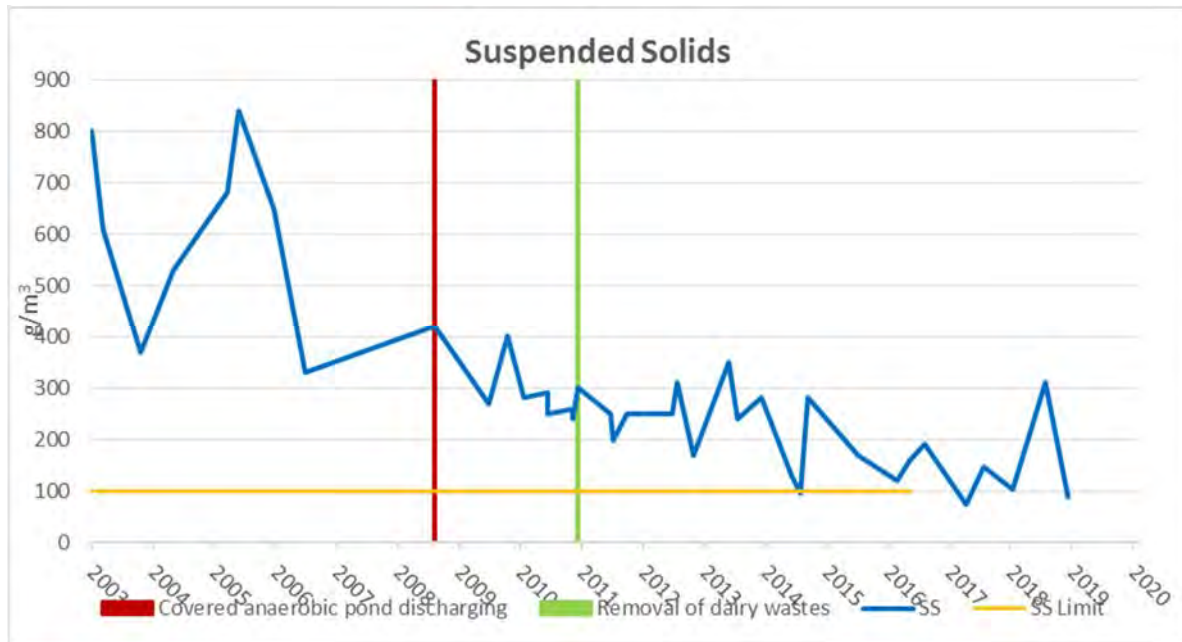


Figure 6 Wastewater suspended solids levels, g/m<sup>3</sup>, 2003-2020

Suspended solids measurements appear to be stable over time as observed in Figure 6<sup>4</sup>.

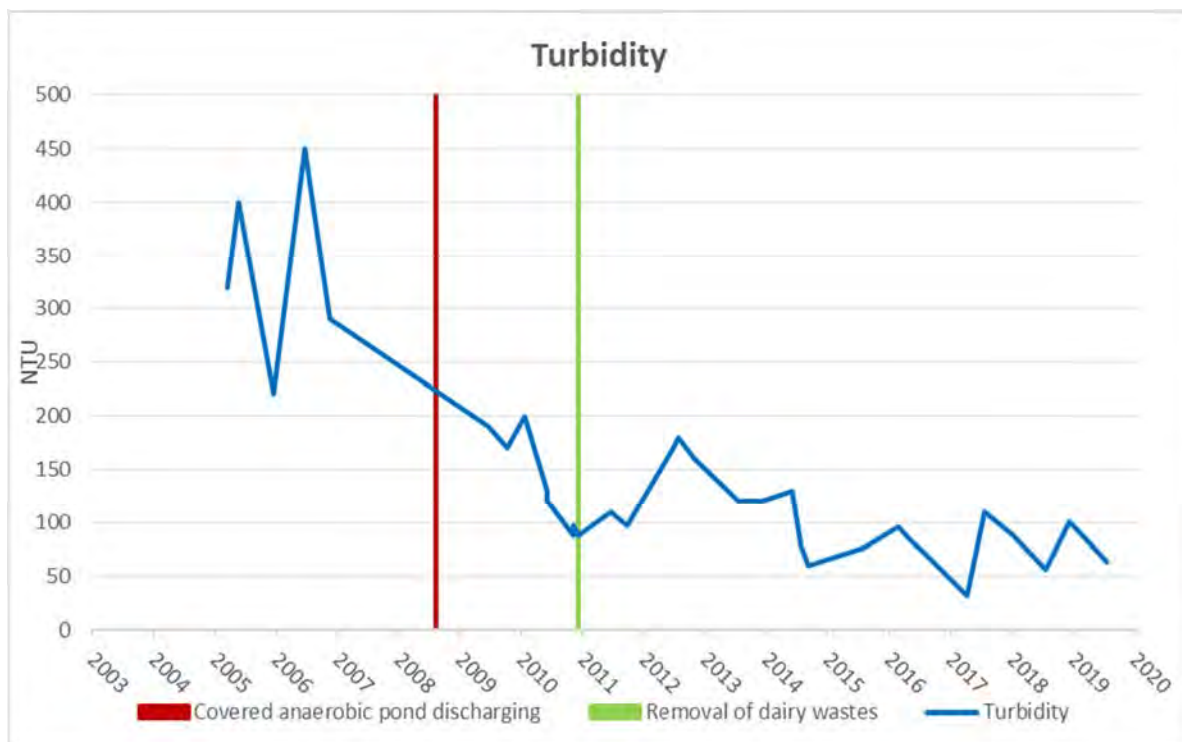


Figure 7 Wastewater turbidity levels, NTU, 2003-2020

Turbidity measurements of the effluent indicate an initial decrease in concentration and being relatively stable in recent times as defined by Figure 7.

<sup>4</sup> Note that the suspended solids limit of 100 g/m<sup>3</sup> has recently been removed from the consent conditions

## 2.1.4 Results of discharge and receiving waters physiochemical monitoring

During the monitoring period, samples were collected on two separate occasions from three sites as shown in Figure 2 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 by R J Hill Laboratories Ltd, Hamilton.

### Survey of 05 November 2019

Receiving water and pond samples were collected during late spring low river flow conditions to verify non discharge conditions. The final pond was sampled to evaluate the nutrient levels in the effluent for land irrigation purposes and the receiving waters were sampled above and below the pond treatment system to ascertain base data for the Waiongana Stream.

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

Table 5 Results of the receiving water compliance survey of 05 November 2019

Site		WGA000361	PGP002002	WGA000363	Consent
Parameter	Unit	Upstream	Discharge	Downstream	limit
Time	NZST	1015	1005	1030	
Temperature	°C	18.1	20.9	18.0	
Conductivity @ 25°C	mSm	16.5	255	16.6	
Chloride	g/m <sup>3</sup>	13.1	310	13.2	
pH	pH	8.2	7.9	8.3	
BOD <sub>5</sub> (total carbonaceous)	g/m <sup>3</sup>	-	53	-	
BOD <sub>5</sub> (carbonaceous filtered)	g/m <sup>3</sup>	<1.0	-	<1.0	2.0 g/m <sup>3</sup> (d/s)
Ammoniacal nitrogen	g/m <sup>3</sup> N	<0.010	89	<0.010	
Un-ionised ammonia	g/m <sup>3</sup> N	0.0005	2.9	0.0006	0.025 g/m <sup>3</sup> (d/s)
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.015	23	0.014	
Suspended solids	g/m <sup>3</sup>	<3	310	<3	
Turbidity	NTU	1.22	100	1.38	
Nitrogen (TKN)	g/m <sup>3</sup>	-	106	-	
Nitrogen (TN)	g/m <sup>3</sup>	-	125	-	
Potassium (TP)	g/m <sup>3</sup>	-	260	-	
Appearance		Clear	Turbid green	Clear	

### Survey of 18 June 2020

Samples were collected approximately five hours after the discharge had commenced during overcast wet weather conditions after a period of heavy rain throughout the catchment. At the time of sampling the stream was in a receding fresh. The flow rate was approximately 23 m<sup>3</sup>/s, and was running turbid green brown in colour. There had been a peak flow of 59.5 m<sup>3</sup>/s three and half hours prior to the samples being taken. The piggery discharge flow rate from the final pond was estimated at 14 L/s. The wastewater discharge from the final pond had shown no visual downstream environmental impact on the Waiongana Stream at the time of the survey. The consent holder continued to discharge for a further 26.5 hours before

ceasing when the river flow had fallen to approximately 7.8 m<sup>3</sup>/s. The discharge commenced 18 June 2020 at 0930 hrs and finishing 19 June 2020 at 1700 hrs.

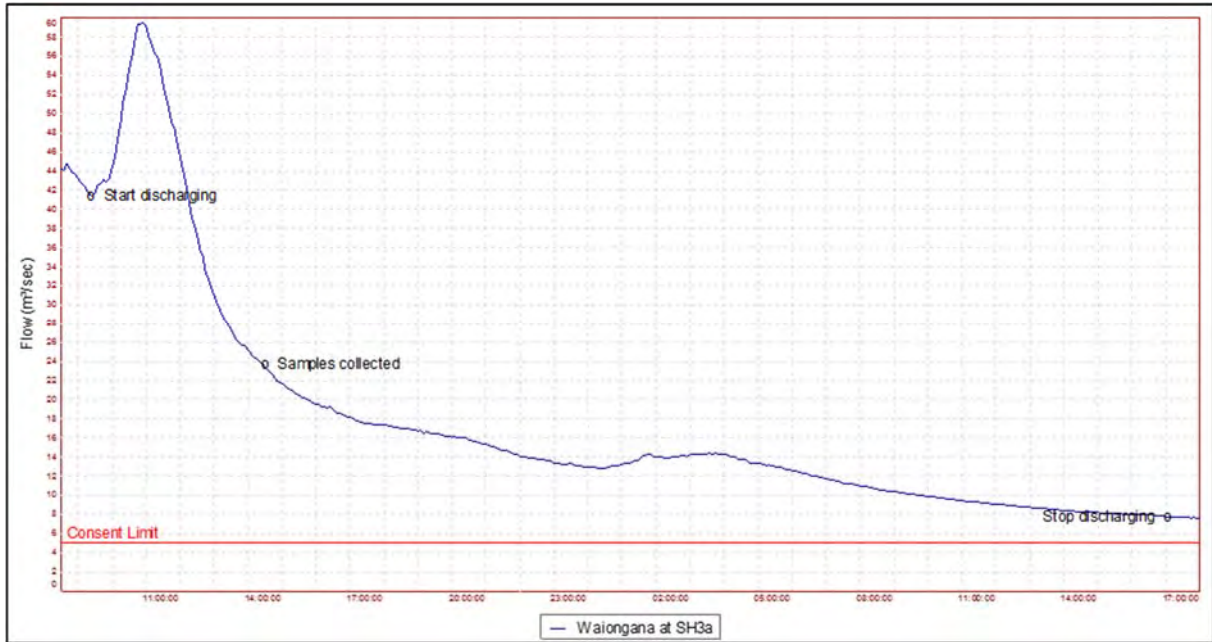


Figure 8 Flow data recorded for the Waiongana Stream during the discharge of wastewater from Leppers piggery

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

Table 6 Results of the receiving water compliance survey of 18 June 2020

Site		WGA000361	PGP002002	WGA000363	Consent
Parameter	Unit	Upstream	Discharge	Downstream	limit
Time	NZST	1430	1400	1445	
Temperature	°C	13.2	14.1	13.2	
Conductivity @ 25°C	mSm	6.3	355	6.6	
Chloride	g/m <sup>3</sup>	6.3	360	6.6	
pH	pH	7.4	8.2	7.2	
BOD <sub>5</sub> (total carbonaceous)	g/m <sup>3</sup>	-	47	-	
BOD <sub>5</sub> (carbonaceous filtered)	g/m <sup>3</sup>	7.6	-	1.3	2.0 g/m <sup>3</sup> (d/s)
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.136	220	0.31	
Un-ionised ammonia	g/m <sup>3</sup> N	0.00072	9.4	0.00113	0.025 g/m <sup>3</sup> (d/s)
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.035	28	0.052	
Suspended solids	g/m <sup>3</sup>	112	88	110	
Turbidity	NTU	47	63	49	
Nitrogen (TKN)	g/m <sup>3</sup>	-	230	-	
Nitrogen (TN)	g/m <sup>3</sup>	-	240	-	

Site		WGA000361	PGP002002	WGA000363	Consent
Parameter	Unit	Upstream	Discharge	Downstream	limit
Potassium (TP)	g/m <sup>3</sup>	-	290	-	
Appearance		Turbid brown	Turbid green brown	Turbid, brown	

Based on flow data at the time of sampling the dilution rate was about 1 part effluent to 1600 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 0.174 g/m<sup>3</sup> N in ammoniacal nitrogen did not result in non-compliance with the un-ionised ammonia N limit imposed by Special Condition 19. There was a notable decrease in the filtered carbonaceous BOD<sub>5</sub> which may have the result of a rapid streamflow recession at the time of sampling. 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.

At the time of the survey, the piggery pond treated wastewater quality was similar to that previously recorded in terms of pH, conductivity and chloride levels. BOD<sub>5</sub> was recorded at 47 g/m<sup>3</sup> at the discharge. Suspended solids and turbidity of the discharge were also similarly low.

The discharge was also sampled to evaluate the nutrient (nitrogen and potassium) levels in the effluent for land irrigation purposes when not discharging to water.

### 2.1.5 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, 2019-2020

Discharge date	Duration (approx. hours)	Stream flow above 5 m <sup>3</sup> /sec
03 July 2019	21.25	Yes
16 July 2019	6.5	Yes
09 August 2019	8.5	Yes
11 October 2019	9.1	Yes
23 October 2019	8	Yes
14 November 2019	3	Yes
17 November 2019	11.5	Yes
20 December 2019	5.5	Yes
25 May 2020	22	Yes
18 June 2020	31.5	Yes
29 June 2020	21.75	Yes
<b>Total discharge hours</b>	<b>148.6</b>	

These records indicate that the treated effluent discharge into the Waiongana Stream was well managed and that good wastewater dilution ratios had 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 consented 5 m<sup>3</sup>/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](http://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 m<sup>3</sup>/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.

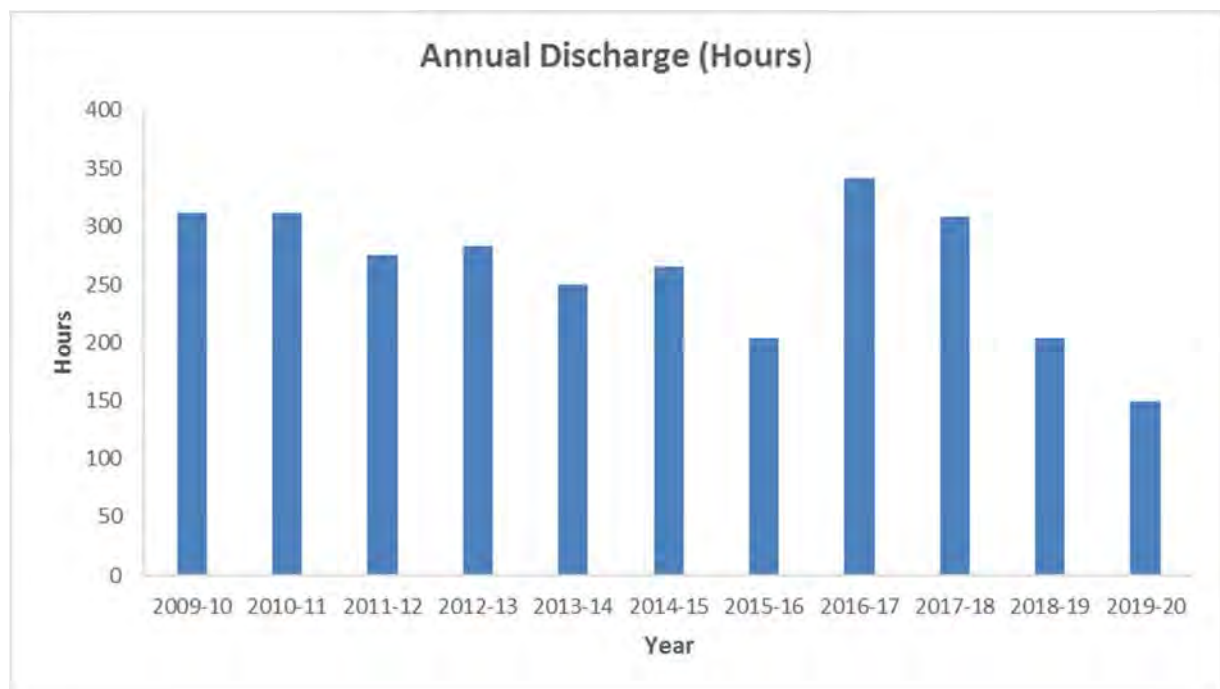


Figure 9 Yearly discharge hours

In terms of the average discharge volume, over the past eleven years this was calculated to be 13,306 m<sup>3</sup> per annum (264 actual discharge hours x 14 L/s discharge flow rate). If the current monitoring period discharge volume (7,510 m<sup>3</sup>) was compared to this average, the volume discharged reduced by 44% when compared to the long term average. This reduction in part is due to the introduction of land based disposal.

For the 2019-2020 monitoring period there was a significant decrease in the volume of treated wastewater discharged into the Waiongana Stream compared to the previous year. Overall the volume is relatively low compared to earlier years. Irrigation to land in preference to discharging to water has significantly decreased the volume of wastewater discharged to water.

### 2.1.6 Discharge to land

Approximately 6,405 m<sup>3</sup> of treated effluent from the final pond had been spray irrigated to 25 h of land.

An estimation for the nitrogen (TN) discharged to land, based on the two sampling results represented in Tables 5 & 6 shows the averaged result of 183 g/m<sup>3</sup>.

Therefore the nitrogen application rate discharged to land equates to approximately 47 kg/ha well below the consented condition of 200 kg/ha over any 12 month period.

An estimation for potassium (TK) discharged to land, based on the two sampling results represented in Tables 5 & 6 shows the averaged result of 275 g/m<sup>3</sup>.

Therefore the potassium application rate discharged to land equates to approximately 70.5 kg/ha well below the consented condition of 100 kg/ha over any 12 month period.

The Land Disposal Options Report (LDOR) due in the 2020-2021 monitoring period will determine the land application rates, in particular looking at the potassium and nitrogen loading rates.

The LDOR will also outline a five year target of maximising irrigation to land and reducing the discharge to water.

Inspections found that no effluent had been discharged within 25 m of waterways nor were there any issues of odour or ponding related to spray irrigation activities.

### 2.1.7 Implementation Plan

The implementation of the land based irrigation system, as supplied by the consent holder is to be phased in over the following five years.

#### Year 1 2017-2018

- Consents to land, water and air were granted.
- Study the consent conditions and begin consultation with management and staff of the dairy farm.

#### Year 2 2018-2019

- A pump shed at the bottom ponds housing the pump and equipment was installed.
- A power cable was installed and connected to the pump shed.
- The spray irrigation mainline and hydrants are constructed.
- Acquire the irrigator.
- Commence irrigation on the north western area of the bottom block.

#### Year 3 2019-2020

- Review the programme with management and staff of the dairy farm and progressively expand the existing mainline to cover the total bottom block.

#### Year 4 2020-2021

- With the dairy farm management and staff, review the bottom block operation and plan the top block irrigation system.
- Provide a Land Disposal Options Report (LDOR) to Council.



#### Year 5 2021-2022

- Undertake trials to evaluate the effects of spreading anaerobic effluent onto pastures on the top block. This will include assessing the effects of different effluent application rates on dairy cow grass grazing and odour levels.

#### Year 6 2022-2023

- Build a storage pond/tank.
- Purchase and install a pumping station.
- Purchase an irrigator and pipeline.

The staged introduction of the effluent application plan is proposed to slowly introduce the changes to the dairy farm management and associated staff. This is suggested to incorporate the effluent spreading program into the dairy cows' paddock rotation. If it is rushed and there are any negative reactions to it, the whole discharge to land may be at risk.

When the effluent spreading project is operational, the Trust is planning to approach neighbouring farmers to discuss the possibility of entering into a commercial arrangement to spread the effluent on their farms. If this is successful there could be a point in time when all the effluent is discharged to land.

The implementation plan is well on target up to year 3 (2019-2020). Irrigation lines are to be extended and the consent holder is to provide a Land Disposal Options Report (LDOR) to Council in year 4 (2020-2021).



Figure 10 New pump shed recently built on the final aerobic pond for spray irrigating treated piggery effluent to land





Figure 11 Pump systems from final aerobic ponds which transport effluent to the stream



Figure 12 Inside the pump shed showing the multi stage variable speed pump



Figure 13 Piping and hydrants locations of the bottom block

Total area of land available to receive the discharge to land;

- Top Block = 17.7 ha
- Bottom Block = 29.0 ha
- Total area = 46.7 ha
- Less set back areas from drains = 5.0 ha
- Total area available to receive effluent = 41.7 ha

## 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.

## 2.3 Incidents, investigations, and interventions

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.

For all significant compliance issues, as well as complaints from the public, the Council maintains a database record. The record includes events where the individual/organisation concerned has itself notified the Council. Details of any investigation and corrective action taken are recorded for non-compliant events.

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 individual/organisation is indeed the source of the incident (or that the allegation cannot be proven).

In the 2019-2020 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with the Company's conditions in resource consents or provisions in Regional Plans.

## 3 Discussion

### 3.1 Discussion of site performance

In 2015, Consent 0715 was renewed to allow the 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. The renewed consent also provided for disposal of the effluent to land through a spray irrigation system that was to be constructed during the term of the consent. The renewed 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 instigated. Consent 5206 was changed to provide for the discharge of emissions to air from the application of effluent to land.

Consent 0715-4.1 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 in a system of oxidation ponds involving at least one anaerobic pond and two aerobic ponds for control of odour. An effluent irrigation system of minimum area 25 ha/m was installed by June 2020, with discharge to land maximised and discharge to water minimised. The calculated volume of effluent discharged to Waiongana Stream was significantly lower than the previous two years, due largely to the commencement of irrigating to land (water application volume = 54%, land application volume = 46%).

Under the two consents, the Trust is required to provide to the Council for approval, management plans on the 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, which will 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. The consent holder has engaged Colin Kay Agricultural Consultant, to present the combined Land Disposal Options Report to Council due 2020-2021.

For the 2019-2020 period, records of pig numbers and effluent discharges were provided, as required. The piggery size and number of 50 kg equivalents remain mainly unchanged and met the consent limit.

The Waiongana Stream flow was above the minimum rate required on each discharge occasion.

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.

The weaner sheds are being upgraded to allow for 160 weaners per shed. One shed has been upgraded and the remaining seven weaner sheds will be upgraded including the farrowing sheds over the next 12 month period. An imported plastic grating floor is installed above the effluent pit which holds up to 50 mm water.



The shed effluent outlet plug is pulled at the end of a 7.5 week rotation. This new system will produce less effluent, odour will be minimised and provide better aerobic digestion in the effluent pit due to the warmer enclosed shed temperature. The upgrade also includes lining the sheds with panel insulation and installing an auto ventilation system.

During Covid19 the Government's Kiwi Harvest Programme procured 2000 pigs per week for six weeks from the pork producers. 1.7 million pork meals were provided for those in need during

this period. This scheme prevented the slaughter of 1000's of pigs which would have otherwise been disposed of at the piggery by burying or composting the animals.

### 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 of the stream at the times of the discharge. Given the high flow conditions and relatively small increase in nutrients observed downstream, post the discharge, environmental effects of the discharge are considered to be negligible.

There is no biological monitoring associated with the piggery discharge. 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.

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. However, currently there is insufficient data 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, although the combined effect of several farm oxidation pond discharges is likely to have an impact. For this reason, Council has signaled to farmers of the region that, as a general rule, farm effluent must be discharged to land (TRC 2017).

It is noted that consent 0715-4.1 was drafted to provide for the establishment of a dual land/water effluent disposal system. The objective is 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.

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 0715-4.1

<b>Purpose: To discharge treated piggery effluent to land and water from an oxidation pond treatment system</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Maximise discharge to land and minimised discharge to water	Monitoring inspections	Yes

<b>Purpose: To discharge treated piggery effluent to land and water from an oxidation pond treatment system</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
2. Effluent generated from allowable pig numbers	Monitoring inspections and consent holder data	Yes
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	Draft Plan to be submitted to Council	Yes
12. Consent to be exercised in accordance with the Effluent Irrigation Management Plan	Draft Plan to be submitted to Council	Yes
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/s	Monitoring inspections indicate 14 L/s	Yes
16. Discharge only when river conditions allow	Consent holder's discharge records and monitoring	Yes
17. Location of discharge point	Monitoring inspections	Yes
18. Safe access to sampling point	Monitoring inspections and sampling	Yes
19. Maximum concentrations in receiving water	Monitoring inspections and sampling	Yes
20. Even effluent application to land	Monitoring inspections and sampling	Yes
21. No effluent ponding on land	Monitoring inspections and sampling	Yes
22. Limits on potassium applied to land	Monitoring inspections and sampling	Yes

<b>Purpose: To discharge treated piggery effluent to land and water from an oxidation pond treatment system</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
23. Limits on total nitrogen applied to land	Monitoring inspections and sampling	Yes
24. No discharge within 25 m of surface water	Monitoring inspections and sampling	Yes
25. Notification of unauthorised effluent discharge	Monitoring and self-notification	Yes
26. Review of consent	Next consent review June 2021	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

Table 9 Summary of performance for consent 5206-2.1

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Total allowable number of pigs on site	Monitoring inspections and consent holder records	Yes
2. Adopt best practical option to minimise adverse effects on the environment	Monitoring inspections and consent review process	Yes
3. Consultation and approval prior to alterations to plant and equipment	Monitoring inspections and consent review process	Yes
4. Minimisation of 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	Yes
8. Review of consent conditions	Next consent review 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable



Table 10 Summary of performance for consent 0188-4

<b>Purpose: To take water from an unnamed tributary of the Waiongana Stream for piggery purposes</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable (consent 0188-4 was withdrawn 22 November 2019 and is now a permitted activity)

Table 11 Evaluation of environmental performance over time

<b>Year</b>	<b>Consent no</b>	<b>High</b>	<b>Good</b>	<b>Improvement req</b>	<b>Poor</b>
2010	0715	1	-	-	-
	5205	1	-	-	-
	0188	1	-	-	-
2011	0715	-	1	-	-
	5205	-	1	-	-
	0188	-	1	-	-
2012	0715	1	-	-	-
	5205	1	-	-	-
	0188	1	-	-	-
2013	0715		1	-	-
	5205	1	-	-	-
	0188	1	-	-	-
2014	0715	1	-	-	-
	5205	1	-	-	-
	0188	1	-	-	-
2015	0715	1	-	-	-
	5205	1	-	-	-
	0188	1	-	-	-
2016	0715	1	-	-	-
	5205	1	-	-	-
	0188	1	-	-	-
2017	0715	1	-	-	-
	5205	1	-	-	-

Year	Consent no	High	Good	Improvement req	Poor
	0188	1	-	-	-
2018	0715	1	-	-	-
	5205	1	-	-	-
	0188	1	-	-	-
2019	0715	1			-
	5205	1			
Totals		25	4	0	0

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

### 3.4 Recommendations from the 2018-2019 Annual Report

In the 2018-2019 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at D H Lepper Trust Piggery in the 2019-2020 year continue at the same level as in 2018-2019 period except where noted below.
2. THAT should there be issues with environmental or administrative performance in 2019-2020, 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 m<sup>3</sup>/s.
4. THAT the frequency of Inspections in the 2019-2020 monitoring programme continue at three per year, with provision for a further inspection to be performed if required.
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.

The following recommendations were undertaken: 1, 3, 4, 5 and 6.

Recommendation 2 was not required.

### 3.5 Alterations to monitoring programmes for 2020-2021

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

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

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

It is proposed that for 2020-2021, that monitoring of consented activities at DH Lepper Trust Piggery remains the same as that scheduled in 2019-2020.

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 2020-2021.

## 4 Recommendations

1. THAT in the first instance, monitoring of consented activities at D H Lepper Trust Piggery in the 2020-2021 year continue at the same level as in 2019-2020 period.
2. THAT should there be issues with environmental or administrative performance in 2020-2021, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

## 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 25°C and expressed in $\mu\text{S}/\text{cm}$ .
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.
$\text{g}/\text{m}^2/\text{day}$	Grams/metre <sup>2</sup> /day.
$\text{g}/\text{m}^3$	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.
$\text{m}^2$	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.
$\mu\text{S}/\text{cm}$	Microsiemens per centimetre.
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.
$\text{NH}_4$	Ammonium, normally expressed in terms of the mass of nitrogen (N).

NH <sub>3</sub>	Unionised ammonia, normally expressed in terms of the mass of nitrogen (N).
NO <sub>3</sub>	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 a Science Services Manager.

## Bibliography and references

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# Appendix I

## Resource consents held by DH Lepper Trust

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

### Water abstraction permits

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14. Permits authorising the abstraction of water are issued by the Council under Section 87(d) of the RMA.

### Water discharge permits

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations. Permits authorising discharges to water are issued by the Council under Section 87(e) of the RMA.

### Air discharge permits

Section 15(1)(c) of the RMA stipulates that no person may discharge any contaminant from any industrial or trade premises into air, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising discharges to air are issued by the Council under Section 87(e) of the RMA.

### Discharges of wastes to land

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising the discharge of wastes to land are issued by the Council under Section 87(e) of the RMA.

### Land use permits

Section 13(1)(a) of the RMA stipulates that no person may in relation to the bed of any lake or river use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Land use permits are issued by the Council under Section 87(a) of the RMA.

### Coastal permits

Section 12(1)(b) of the RMA stipulates that no person may erect, reconstruct, place, alter, extend, remove, or demolish any structure that is fixed in, on, under, or over any foreshore or seabed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Coastal permits are issued by the Council under Section 87(c) of the RMA.

**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

## Consent 0188-3

### 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

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**Director-Resource Management**

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

Name of  
Consent Holder: DH Lepper Trust  
(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.

## Consent 0715-4.0

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.



## Consent 0715-4.0

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.

## Consent 0715-4.0

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 <sub>5</sub>	110 gm <sup>-3</sup>
Suspended solids	100 gm <sup>-3</sup>

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 <sup>-3</sup>
Filtered carbonaceous BOD <sub>5</sub>	2.0 gm <sup>-3</sup>

### 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

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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: Steven Maxwell Lepper & Paul Robert Franklin]  
326 Wortley Road  
R D 9  
INGLEWOOD

Consent Granted  
Date: 13 November 2008

**Conditions of Consent**

Consent Granted: To discharge emissions into the air from a pig farming operation and associated practices including solids composting, effluent treatment and other waste management activities at or about (NZTM) 1704054E-5674882N [Piggery] and 1704345E-5676156N [Ponds]

Expiry Date: 1 June 2026

Review Date(s): June 2009, June 2011, June 2013, June 2016, June 2020

Site Location: Mountain Road, Lepperton

Legal Description: Lot 3 DP 21006 [Piggery] & Pt Lot 1491, Pt Lot 2 DP 2634 [Ponds]

## Consent 5206-2

### General conditions

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

### Special conditions

1. The number of pigs [equivalent 50 kg per pig] on the property at any one time shall not exceed 3500 pig equivalents.
2. Notwithstanding any other condition of this consent, the consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.
3. Before 30 September 2009, the development of the covered anaerobic pond shall be completed. From that date gases emanating from the covered anaerobic pond shall be captured and appropriately utilised as an energy source.
4. Prior to undertaking any alterations to the piggery unit's processes, operations, equipment or layout, which may significantly change the nature or quantity of contaminants emitted from the site, the consent holder shall consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act 1991 and its amendments.
5. The consent holder shall minimise the emissions and impacts of contaminants discharged into air from the site by:
  - a) the selection of the most appropriate process equipment;
  - b) process control equipment and emission control equipment;
  - c) the methods of control;
  - d) the proper and effective operation, supervision, maintenance and control of all equipment and processes; and
  - e) the proper care of all pigs on the site.
6. Subject to condition 7, the discharges authorised by this consent shall not give rise to an odour at or beyond the property boundary that is offensive or objectionable.

## Consent 5206-2

7. To allow for the conversion of the existing anaerobic pond to an aerobic state, discharges from this pond may give rise to intermittent offensive and objectionable odour beyond the property boundary until 30 September 2009.
8. For the purposes of condition 6 and 7, an odour shall be deemed to be offensive or objectionable if:
  - a) it is held to be so in the opinion of an enforcement officer of the Taranaki Regional Council, having regard to the duration, frequency, intensity and nature of the odour; and/or
  - b) an officer of the Taranaki Regional Council observes that an odour is noticeable, and either it lasts longer than three (3) hours continuously, or it occurs frequently during a single period of more than six (6) hours; and/or
  - c) no less than three individuals from at least two different properties, each declare in writing that an objectionable or offensive odour was detected beyond the boundary of the site, provided the Council is satisfied that the declarations are not vexatious and that the objectionable or offensive odour was emitted from the site at the frequency and duration specified in (b). Each declaration shall be signed and dated and include:
    - the individuals' names and addresses;
    - the date and time the objectionable or offensive odour was detected;
    - details of the duration, frequency, intensity and nature of the odour that cause it to be considered offensive or objectionable;
    - the location of the individual when it was detected; and
    - the prevailing weather conditions during the event.
9. The consent holder shall provide an Odour Management Plan that details to the satisfaction of the Chief Executive of Taranaki Regional Council how odorous emissions beyond the property boundary will be minimised by 30 September 2009. The plan shall include:
  - i) Define the environmental effect/s being managed by the plan and the objective sought in relation to this effect;
  - ii) Identify key personnel responsible to managing the effect;
  - iii) Describe the activities on the site and describe the main potential sources of odour emissions;
  - iv) Identify and describe methods of mitigation and operating procedures including the dewatering of the anaerobic pond or during control contingency discharge events;
  - v) Monitoring methods including record keeping of maintenance and control parameters, any odour complaints received and weather conditions present at time of complaints.

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

Consent 5206-2

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2009 and/or June 2011 and/or June 2013 and/or June 2016 and/or June 2020, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 13 November 2008

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**