

NZ Pure Bred Genetics Ltd (Piggery)  
Monitoring Programme  
Annual Report  
2015-2016

Technical Report 2016-93

ISSN: 1178-1467 (Online)  
Document: 1725496 (Word)  
Document: 1753499 (Pdf)

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November 2016



## Executive summary

NZ Pure Bred Genetics Ltd (formerly Meadowvale Piggery) operates a piggery located on Mountain Road at Midhirst, in the Manganui catchment. Transfer of consents between the two parties became effective on 1 December 2012. NZ Pure Bred Genetics Ltd (the Company) specialises in growing eight to ten weeks old weaners for the market and do not grow fattening pigs at the piggery. Significantly less effluent is produced by not growing fattening pigs.

This report for the period July 2015 to June 2016 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Company's environmental performance during the period under review, and the results and environmental effects of the Company's activities.

The Company holds two resource consents, which include a total of 22 conditions setting out the requirements that the Company must satisfy. The Company holds resource consent **0351-3** to allow the discharge of treated effluent to land and into Rumkeg Creek and consent **5249-2** to allow the discharge of emissions into the air from the piggery site.

Consent **0351-3** expired on 1 June 2015 and an application to renew the consent has been applied for. Section 124 of the Resource Management Act (1991) allows the consent holder to operate on the existing consent until a new consent has been granted.

The consent holder will need to consider the proposed changes in the Regional Fresh Water Plan which relates to managing diffuse source discharges to land and water in the Taranaki Region when a new consent is applied for.

The Council's monitoring programme for the year under review included four inspections and two wastewater and receiving water physicochemical surveys.

The number of pigs (equivalent 50 kg per pig) had increased during the 2015-2016 period by 25%, from 605 to 767 pig equivalents.

In the 2015-2016 monitoring period, the Council had received three alleged complaints concerning the Company regarding odour, sump overflows and discharges of pig effluent to water. All these complaints were investigated and found that no 'objectionable' and or 'offensive' odour was found to be emanating beyond the piggery boundary nor were there any unauthorised discharges from the effluent treatment system discharging into the receiving waters.

**During the year the company demonstrated an overall good level of environmental performance.**

This report includes recommendations for the 2016-2017 year.

For reference, in the 2015-2016 year, 71% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 24% demonstrated a good level of environmental performance and compliance with their consents.

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 good level in the year under review.

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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 2015 to June 2016 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by NZ Pure Bred Genetics Ltd (formerly known as Meadowvale Stud Farm Ltd Piggery).

NZ Pure Bred Genetics Ltd (the Company) is operated by J & R Cooley who leases the piggery buildings and associated wastewater treatment system from E & J O'Sullivan. The Company operates a piggery situated on Mountain Road at Midhirst, in the Manganui catchment.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by the Company that relate to discharges of water within the Manganui catchment, and the air discharge permit held by 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 Company's use of water, land and air, and is the 12th combined annual report by the Council for the site.

### **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 Company in the Manganui 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 Company's site.

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

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

Section 4 presents recommendations to be implemented in the 2016-2017 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 Company, 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 Company’s approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

Events that were beyond the control of the consent holder and unforeseeable (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 2015-2016 year, 71% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 24% demonstrated a good level of environmental performance and compliance with their consents.

## 1.2 Process description



**Figure 1** Aerial photograph of the piggyery and waste water treatment ponds

The Company currently have the largest registered purebred herd in New Zealand with the NZ Pig Breeders Association of Berkshire, Duroc, Hampshire, Large White and Landrace breeds. Current stock numbers include up to 180 sows, gilts, weaners, boars and up to 150 piglets and any one time (Table 1).

**Table 1** Piggery Composition as at 30 June 2016

Type of pigs	No of pigs	Average weight	Total weight	50 kg Equivalent pigs
Sows	180	162	29160	583
Gilts	24	150	3600	72
Boars	18	160	2880	58
Weaners ( 8 – 10 weeks)	150	18	2700	54
<b>Total</b>	<b>372</b>		<b>38340</b>	<b>767</b>

The Company specialises in growing eight to ten weeks old weaners for the market and do not produce fattening pigs at the piggery. Significantly less effluent is produced by not growing fattening pigs.

Piggery wastewater is collected from various collection sumps situated around the piggery. Raw piggery effluent passes through a cyclone separator (Photo 1) which separates out the solid component (Photo 2) from the wastewater. Removal of solids from the wastewater stream significantly reduces the biochemical oxygen demand (BOD). Wastewater from the separation process is pumped back to the initial anaerobic pond. The solid waste is binned and sold as a soil conditioner (Photo 3).

**Photo 1** Cyclone effluent separator**Photo 2** Solid piggery waste

The oxidation pond system consists of three ponds as shown in Figure 1. These ponds were designed to operate as an initial anaerobic pond, followed by two aerobic ponds. However, in practice the second pond operates as an anaerobic pond. Therefore there are two anaerobic ponds and one aerobic pond.

These ponds are adequately sized for the treatment of the piggery wastes provided the system is regularly maintained.



**Photo 3** Solids separation area where solid waste is stored in bins

From the treatment pond system, treated wastewater is spray irrigated to the surrounding farmland, including a neighbouring property or discharged to the Rumkeg Creek. Rumkeg Creek is a tributary of the Manganui River in the Waitara catchment and joins the Manganui River 750 m downstream of the discharge.

Wastewater from the treatment system is only discharged to the Rumkeg Creek when river flow conditions provide for at least 250 times effluent dilution. When low receiving water flow conditions preclude this discharge, it is expected that treated wastewater should be spray irrigated onto nearby farmland.

It is recommended that wastewater is spray irrigated onto the surrounding farmland from the second anaerobic treatment pond. Previously untreated wastewater was pumped directly from the separator sump which had contributed to odour issues during certain wind conditions. Spray irrigating partially treated effluent will reduce the odour effects which are sometimes associated with spray drift.

## 1.3 Resource consents

### 1.3.1 Water and Land 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.

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.

The Company holds water and land discharge permit **0351-3** to discharge treated piggery effluent from an oxidation pond treatment system into the Rumkeg Creek, a tributary of the Manganui River in the Waitara catchment (during high flow conditions) and to discharge treated piggery effluent into and onto land. This permit was issued by the Taranaki Regional Council on 5 September 2003 (change of conditions: 27 July 2009) as a resource consent under Section 87(e) of the RMA.

Permit **0351-3** expired on 1 June 2015 and the Company applied to renew this permit in late Feb 2015. Whilst the Council processes this application the Company are operating under the expired permit, this is in accordance with section 124 of the RMA.

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

The discharge of piggery effluent to land greatly improves soil fertility. However piggery effluent also has the potential to contaminate groundwater and surface water if managed inappropriately.

The Council's policy is to promote spray irrigation to land in preference to discharging to water.

There are sixteen special conditions that are attached to this consent.

#### **Discharge to water**

Special condition 1 refers to the consent holder operating the piggery and associated activities and discharges in accordance to information provided as directed by conditions set out in the resource consent.

Special conditions 2, 3 and 4 relate to the operation of piggery and associated activities and discharges to water within consent conditions and defines the mixing zone and prohibited effects on the receiving waters.

Special condition 5 requires the consent holder to operate and maintain the treatment and discharge system to ensure compliance.

Special condition 6 requires the consent holder to maintain the minimum dilution rate at all times in the receiving water at point of discharge.

Special condition 7 requires the consent holder to monitor, maintain and supply records of the discharge.

Special condition 8 requires riparian fencing and planting to be completed.

#### **Discharge to land**

Special conditions 9 and 10 limit effluent application rates to land in terms of nutrient loadings over any 12 month period.

Special conditions 11, 12 and 13 relate to areas and locations of land discharge, prohibit discharges to surface water, and place restrictions on ponding.

Special condition 14 requires the consent holder to monitor and maintain records of the land discharge.

Special condition 15 requires that the discharge to land shall be maximised and used in preference to discharge to water.

Special condition 16 relates to review of consent conditions.

The permit is attached to this report in Appendix I.

### **1.3.2 Air discharge permit**

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

The Company holds air discharge permit **5249-2** to discharge emission into the air from a pig farming activity and associated activities, including solids composting, effluent treatment and irrigation and other waste management activities. This permit was issued by the Council on 27 July 2009 as a resource consent under Section 87(e) of the RMA. It is due to expire on 1 June 2027.

Piggery effluent has the potential to produce significant odour especially when discharged to land. Six special conditions are attached to this consent.

Special condition 1 stipulates the number of pigs equivalents allowed on the property at any one time.

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 controls alterations which may significantly change the nature or quantity of contaminants from the site.

Special condition 4 requires the consent holder to minimise the emissions and impacts of air contaminants from the site.

Special condition 5 requires the consent holder limit odour at or beyond the boundary.

Special condition 6 allows for two additional reviews.

The permit is attached to this report in Appendix I.

## **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 Company consisted of four 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 reviews;
- renewals;
- new consents;
- advice on the Council's environmental management strategies and content of regional plans and;
- consultation on associated matters.

### 1.4.3 Site inspections

The Company was visited four times during the monitoring period. With regard to consents for discharge to water land and air, 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.

### 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 Company's discharge was sampled on two occasions, and the sample analysed for carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>), chloride, conductivity, suspended solids, and dissolved reactive phosphate (DRP), un-ionised ammonia, pH, turbidity and temperature.

Rumkeg Creek was also sampled on the same occasions, upstream and downstream of the treated discharge. The samples were analysed for filtered carbonaceous biochemical oxygen demand (FCBOD<sub>5</sub>), chloride, conductivity, suspended solids, dissolved reactive phosphate (DRP), un-ionised ammonia, pH, turbidity and temperature.

The monitoring programme allows for the discharge and receiving water to be sampled on two occasions.

### 1.4.5 Biomonitoring surveys

No bio-monitoring survey for the piggery was undertaken in the 2015-2016 monitoring period, as none was scheduled within the baseline monitoring programme. Because of the reduction of treated piggery effluent discharge periods including the reduction of pig numbers, a biomonitoring survey was not considered necessary on this occasion.

## 2. Results

### 2.1 Water

#### 2.1.1 Inspections

##### 6 August 2015

The first inspection for the monitoring period was carried out after a period of heavy rain throughout the catchment. The solids separator was operating with sawdust-like product being produced from the separator and stored in lined bins. Wastewater from this process was pumped back into the initial pond (Pond 1). Slightly noticeable odour was emanating from around this area. The pond levels were relatively high with the final aerobic pond discharging into the Rumkeg Creek at an estimated flow rate of 10 L/sec. Rumkeg Creek was running in a fresh at the time of inspection and the Denbigh Road Bridge staff gauge was recorded at 0.7 m. There were no visual environmental impacts noted in the downstream receiving water from the piggery discharge. There were no detectable odours at various sites around the piggery nor could odour be detected offsite. The piggery appeared to be well managed.

##### 26 November 2015

A north westerly wind was blowing at the time of inspection. There were no detectable odours at various sites around the piggery nor was odour detected offsite. The ponds appeared to be operating well. The final aerobic pond bund wall had been raised to enable more storage capacity. This pond had ample storage capacity available. No treated effluent had discharged to the Rumkeg Creek for a considerable period mainly due to fine weather conditions. The solids separator was operating and the sawdust like product produced was going into lined bins. Wastewater was pumped back to the initial pond. Overall the piggery and effluent wastewater system appeared to be well managed.

##### 3 February 2016

An on site meeting and inspection was held at the piggery to discuss progress made as regard to Consent 0351 renewal. Specific items discussed at the meeting are detailed below:

- No discharge to land had been occurring. Discharge Consent **0351** condition 15: *The discharge to land shall be maximised and be used in preference to discharge to water.* Although the landowner has not refused to allow the consent holder to discharge effluent to his land, the relationship between both parties is strained and has therefore prevented any discharge to land taking place.
- Piggery discharge records showed that there have been seven separate discharges for the period 4 August 2015 to 8 January 2016.
- The Council recommended that the effluent discharge valves from off the final pond be locked to prevent any unauthorised discharge and should be undertaken as part of the consent holders duty of care. However, the consent holder noted he is vigorously monitoring the discharge.
- To prevent biosecurity issues when visiting the piggery, contact should be made with the consent holder prior to visiting and there must have been no

recent contact with other piggeries or swine. A 'sign in' register is to be held at the piggery as requested by the veterinary group.

- There had been an increase in production numbers as was reported in the 2014/2015 Annual Monitoring Report.

The inspection was carried out during fine dry weather conditions with a slight westerly breeze blowing. Approximately 0.75 m of freeboard was showing on the final pond. The newly built up bund appeared to be holding well with no sign of any seepage, showing where the bund wall had been built up. Cattle had not grazed or had access around the pond bunds.

There was no evidence that recent discharge had taken place. The consent holder records showed that the last discharge occurred on the 8 January 2016 (telemetry records indicated high rainfall throughout the Manganui catchment during the period of discharge). No heterotroph growths (sewage fungus) were found to be growing on the stream bed as a result of piggery effluent discharge.

Solids continue to be removed via the separator and the product is available as a soil conditioner. Removing solids from the effluent stream significantly reduces the BOD loading on the ponds. An Auckland based product (Eco Stock) was currently being fed to the pigs. This recycled food waste product was intended for dairy farmers but due to the dairy downturn, this was no longer viable. The product had been offered to piggeries as it was otherwise destined for the Auckland Municipal Landfill.

There were no odour issues offsite associated with the piggery. A slight to nil odour was emanating from around the ponds system, separator area, and feed stock areas. Bagged solids from the separator emanated only a slight cooked meal type odour.

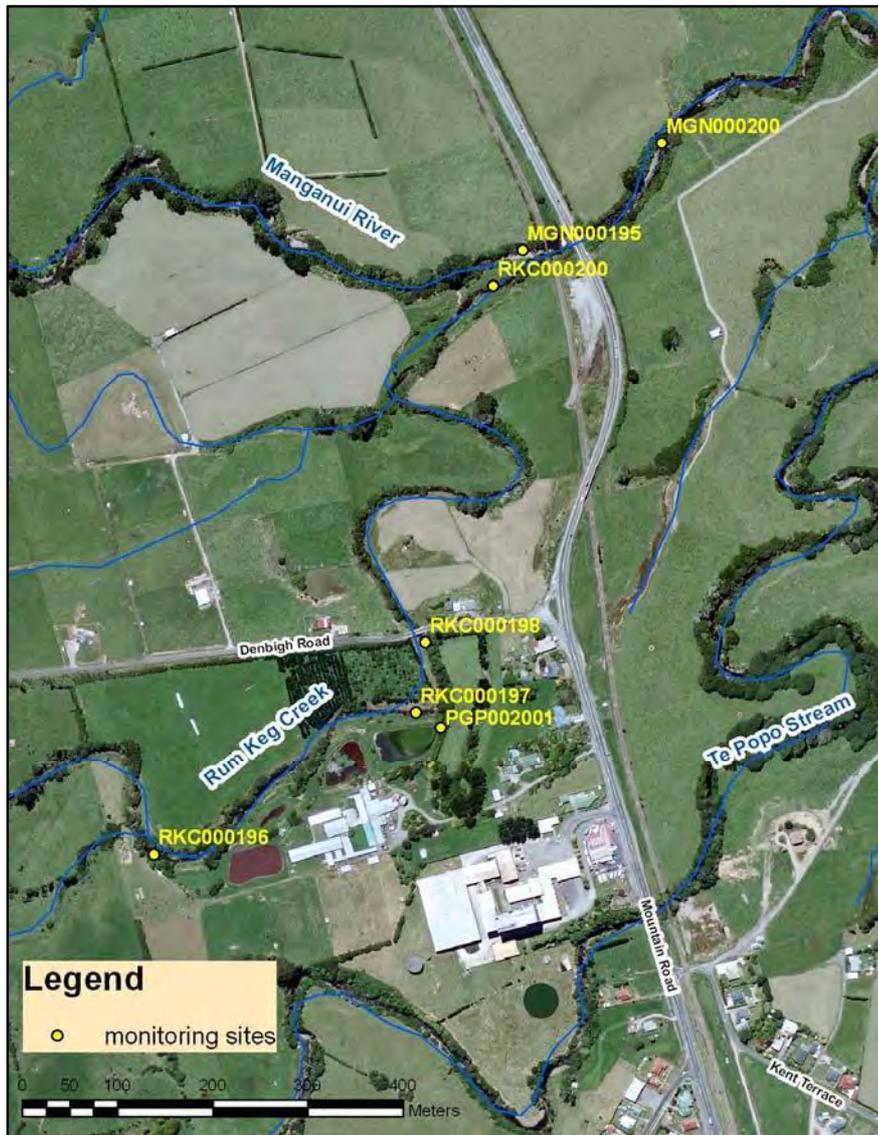
Although no discharge to land had occurred at the time of inspection, the consent holder had improved the waste stream facility by removing most of the solids and recycles effluent from Pond 2 back to Pond 1 of his own initiative. Discharge to land was not carried out in preference to discharge to water

A staff gauge was to be erected on the final pond (Pond 3) and pond level data included with the discharge records.

### **5 May 2016**

The final inspection for the monitoring period was carried out during heavy persistent rain with a northerly breeze blowing. The solids separator was operating with a near full bin below the collection area. Very light odour (almost nil) was emanating from around this area. Both the initial and second ponds were discharging into the final pond. The Rumkeg Creek level was very high and turbid brown in colour. The occupiers had intended to discharge treated wastewater later on that day. Records received from the consent holder show that the discharge had commenced at 1115 hours during very high flow (flood conditions) and ceasing some 10 hours later that evening. No odour could be detected even at a very close proximity to the sheds. Overall the piggery and wastewater system appeared to be well managed.

## 2.1.2 Results of discharge monitoring



**Figure 2** Aerial photograph of monitoring sites

Figure 2 shows the piggery site in relation to the receiving waters of Rumkeg Creek and Manganui River. Te Popo Stream also borders the piggery boundary on the southern side. Environmental monitoring sites are also illustrated in relation to the piggery operation.

**Table 2** Location of sampling sites in Rumkeg Creek, a tributary of the Manganui River

Site	Site code	GPS reference	Location
Rumkeg Creek	RKC000197	E1708759 N5650789	20 metres upstream of piggery discharge
Piggery effluent	PGP002001	E1708785 N5650773	Discharge outlet from aerobic lagoon
Rumkeg Creek	RCK000198	E1708769 N5650764	Denbigh Road Bridge (75m d/s of discharge)

**19 August 2015 survey**

Results of the survey performed on 19 August 2015 are presented in Table 3. On this occasion the stream was running in a fresh and the ponds' treated wastewater discharge was estimated at about 10 L/s.

**Table 3** Results from NZ Pure Bred Genetics Ltd and Rumkeg Creek, sampled on 19 August 2015

Site location Site code		Rumkeg Creek u/s RKC000197	Piggery final effluent PGP002001	Rumkeg Creek d/s RKC000198
Parameter	Unit			
Time		0840	0845	0930
Temperature	°C	9.7	9.8	9.7
Conductivity @ 20°C	mS/m	6.8	82.4	6.6
Chloride	g/m <sup>3</sup>	7.6	33.1	7.2
pH		6.6	7.8	7.4
Total carbonaceous BOD <sub>5</sub>	g/m <sup>3</sup>	-	32	-
Filtered carbonaceous BOD <sub>5</sub>	g/m <sup>3</sup>	0.6	-	1.0
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.250	66.6	0.212
Unionised ammonia	g/m <sup>3</sup> NH <sub>3</sub>	0.0002	0.9318	0.0011
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.037	14.6	0.092
Turbidity	NTU	24	22	38
Suspended solids	g/m <sup>3</sup>	34	52	48
Appearance		Slightly turbid brown	Turbid brown	Slightly turbid brown

These results indicate that the treated wastewater discharge dilution ratio in the stream at the time of sampling was well above the minimum ratio of 1:250 as required by Special Condition 6 of the consent.

Compliance with Special Condition 2 was well achieved for un-ionised ammonia, and filtered carbonaceous BOD<sub>5</sub>, concentrations at the mixing zone boundary.

Compliance with special Condition 3 indicated an unexpected increase in turbidity across the mixing zone, from 24 to 38 NTU. Although records show a slight increase in turbidity (above 50%) this was not regarded as a breach of Consent due to the rising river fresh and the time (50 minutes) of sampling between the upstream and downstream monitoring sites. The piggery discharge NTU was also marginally lower than the upstream monitoring result from 24 to 22 NTU.

Rumkeg Creek staff gauge reading was recorded as 0.75 m at the time of sampling, equating to a river flow of 14,00 L/s.

The consent holder's discharge records received by Council for 19 August 2015 (as required by Special Condition 7 of the consent) show that the treated wastewater discharge commenced when the Rumkeg Creek staff gauge reading was 0.90 m. Water quality samples were collected 30 minutes after the discharge had commenced on a rising fresh, finishing some 17 hours later.

#### 24 March 2016 survey

Results of the survey performed on 24 March 2016 are presented in Table 4. On this occasion the stream was running in a fresh and the ponds' treated wastewater discharge was estimated at about 10 L/s.

**Table 4** Results from NZ Pure Bred Genetics Ltd and Rumkeg Creek, sampled on 24 March 2016

Site location Site code		Rumkeg Creek u/s RKC000197	Piggery final effluent PGP002001	Rumkeg Creek d/s RKC000198
Parameter	Unit			
Time		0900	0905	0930
Temperature	°C	17.8	19.8	18.5
Conductivity @ 20°C	mS/m	6.8	68.5	7.7
Chloride	g/m <sup>3</sup>	8.0	85	9.0
pH		7.1	7.5	7.3
Total carbonaceous BOD <sub>5</sub>	g/m <sup>3</sup>	-	74	-
Filtered carbonaceous BOD <sub>5</sub>	g/m <sup>3</sup>	2.7	-	2.9
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.282	21.4	0.482
Unionised ammonia	g/m <sup>3</sup> NH <sub>3</sub>	0.0014	0.3155	0.0041
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.116	21.8	0.325
Turbidity	NTU	34	74	30
Suspended solids	g/m <sup>3</sup>	41	160	34
Appearance		Turbid dark brown	Turbid yellow green	Turbid dark brown

These results indicate the treated wastewater discharge dilution ratio in the stream at the time of sampling was approximately 1 part effluent to 6,500 parts receiving water, therefore was well above the minimum ratio of 1:250 required by Special Condition 6 of the consent.

Compliance with Special Consent condition 2 was achieved for unionised ammonia. For filtered BOD, the upstream value was above the level (2.0 gm<sup>3</sup>) not be exceeded. The down stream value had only risen by less than 10 %.

There was no significant change in turbidity.

**Table 5** Summary of treated wastewater analyses from the NZ Pure Bred Genetics Ltd piggery for the period July 2010 to June 2015, compared with results for 2015-2016 median

Parameter	unit	N	Range 2010-2015	Median 2010-2015	Median 2015-2016
Conductivity @ 20°C	mS/m	7	61.6 - 175	157	75.4
Chloride	g/m <sup>3</sup>	7	24.2 - 65.7	54	59
pH	pH	7	7.6 - 8.1	7.8	7.6
Total carbonaceous BOD <sub>5</sub>	g/m <sup>3</sup>	5	80 - 120	94	53
Ammoniacal nitrogen	g/m <sup>3</sup> N	7	51 - 176	167	44
Dissolved reactive phosphorus	g/m <sup>3</sup> P	7	15.2 - 37	32	18
Turbidity	NTU	7	48 - 140	120	48
Suspended solids	g/m <sup>3</sup>	7	81 - 310	160	106

Monitoring of wastewater on two occasions during the 2015-2016 year indicated a weaker wastewater than was found in the previous five years, with relatively low total carbonaceous BOD<sub>5</sub>, ammoniacal nitrogen, dissolved reactive phosphorus, conductivity and turbidity. Suspended solids and chloride concentrations were within the recently recorded ranges (Table 5).

### 2.1.3 Gauging water flow

To determine flow rates in the Rumkeg Creek a rating curve is maintained by Council. This enables the consent holder to assess treated wastewater discharge compliance with the minimum dilution ratio of 1:250 (one part effluent to two hundred and fifty parts receiving water flow).

The staff gauge installed on the Denbigh Road Bridge provides the consent holder with the stream level (or height) and a rating chart produced by Council shows stream flow rates at any given time. It was not considered necessary to review the rating curve during the 2015-2016 year but it may be reviewed again in the 2016-2017 monitoring period if required.

### 2.1.4 Treated effluent discharge records

#### Discharge to water

Special condition 6 of consent **0351-3** requires a minimum dilution rate of 1 part effluent to 250 parts receiving water at the point of discharge and is to be maintained at all times during discharge events.

Special condition 7 of consent **0351-3** requires the consent holder shall monitor and maintain discharge records, including date, time, rate, staff gauge reading and duration of discharge. These records are to be supplied to the Council quarterly or as requested.

During the 2015-2016 monitoring period the Council received from the Company records showing 15 daily discharges (134 hours total discharge time) to the Rumkeg Creek.

These records indicate that the consent holder maintained a minimum dilution rate of 1 part effluent to 250 parts receiving water at the point of discharge on all occasions.

In comparison 14 daily discharges (112 hours total discharge time) were recorded for the 2014-2015 monitoring period, 7 daily discharges (30 hours total discharge time) 2013-2014 monitoring period, 5 daily discharges were recorded for the 2012-2013 monitoring period. 51 daily discharges were recorded by Meadowvale piggery during the previous 2011-2012 monitoring period.

### **Discharge to land**

Special condition 14 of Consent **0351-3** requires that the consent holder shall monitor and maintain records of discharge, including date, application area, rate and duration of discharge. These records are to be supplied to the Council quarterly or as requested.

Special condition 15 of consent **0351-3** requires the consent holder to maximise discharge to land in preference to discharge to water.

Effluent application rates to land are required to ensure that the effluent application rate does not exceed the recommended 200 kg nitrogen/ha/year.

No discharge to land was carried out during the 2015-2016 monitoring period. Ongoing issues regarding a lease agreement between the consent holder and landowner have prevented the consent holder discharging effluent to land.

The Council strongly encourages pork producers to use systems that discharge pig manure to land in preference to discharging to water. The nitrogen and potassium content of piggery manure is usually the major determinant of land area required.

## **2.1.5 Liaison with consent holder**

During the 2015-2016 monitoring period, the Council liaised with the consent holder (J Cooley) regarding several operational issues, additional to those required in the monitoring programme. These included matters such as consent renewal, odour management, annual draft report, pond maintenance, piggery operations, discharge effluent record keeping and discharging piggery wastewater to land in preference to water as per the proposed Regional Freshwater Plan.

## **2.2 Air**

### **2.2.1 Inspections**

Air inspections were carried out in conjunction with all the general compliance monitoring inspections at the company's site. Inspections found that only minimal piggery odours were present during one site inspection and no objectionable or offensive odours were recorded beyond the boundary. No dust, smoke or other issues were noted during the inspections of the site.

## 2.2.2 Results of air monitoring

Special condition 5 of consent **5249-2** requires that discharges shall not give rise to an odour at or beyond the property boundary that is offensive or objectionable.

Odours emitted from normal piggery operations are influenced mainly by weather conditions (i.e. wind direction), effluent treatment areas, solids storage and disposal, irrigating to land and general piggery hygiene operations.

The offensiveness of odour on any particular occasion is reliant on individual perception, Council methods of measurement, and management practices of the pork producer. The Environmental Management System (EMS) deals with piggery operational practices ensuring the effect of odour is taken into account when the pork producer is undertaking activities relating to areas of the piggery.

The routine compliance monitoring inspections found that minimal piggery odour were emanating from around the piggery, solids separator, and oxidation treatment ponds system.

## 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 (IR) 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 2015-2016 monitoring period, the Council had received three alleged complaints concerning NZ Pure Bred Pig Genetics Limited regarding odour, sump overflows and discharges of pig effluent to water.

A total of three (two odour and one effluent discharge) incidents associated with NZ Pure Bred Genetics Ltd Farm were investigated by Council Officers. No 'objectionable' and or 'offensive' odour was found to be emanating beyond the piggery boundary nor were there any unauthorised discharges from the effluent treatment system discharging into the receiving waters.

However, the offensiveness of unpleasant odour is reliant on individual perception. There will always be varying degrees of odour strength associated with intensive pig, cattle or poultry farming which can not be entirely eliminated.

The Council's policy is to investigate all complaints received within a four hour period.

All Council Inspecting Officers undergo an olfactory calibration which determines their odour perception.

### 3. Discussion

#### 3.1 Discussion of site performance

During the year the Company demonstrated that a good level of environmental performance and compliance relating to the consents was maintained.

Removing the piggery solids from the raw effluent stream was an improvement on the previous solids removal and storage system and in general had a lot to do with eliminating some of the odour issues that stemmed from around the solids separation area. Solids are now directly transferred and stored into bins which are sold off site as a soil conditioner. Removing solids from the effluent stream significantly reduces the BOD loading on the ponds.

Piggery production had increased during the 2015-2016 period by 25 %, from 605 to 767 pig equivalents. Consent 5249 -2 Special Condition 1: *The number of pigs (equivalents 50 kg per pig) on the property at any one time shall not exceed 2500 pig equivalents.*

A consent requirement to maximise discharge to land as a preference to water was not adhered to. The Council is aware that no treated effluent has been discharged to land because of an ongoing civil dispute between the consent holder and the landowner. There is insufficient land available for this purpose on the landowners property and an agreement will be essential with neighbouring property owners to spray irrigate wastewater to their land in the future. It was not considered to be reasonable to enforce this condition in light of the civil case and there being no adverse impact on the environment.

It is a consent requirement that a minimum dilution rate of 1 part effluent (which is the discharge from the final pond) to 250 parts receiving water shall be maintained at all times in the receiving water at the point of discharge during discharge events. This condition remains in force until any change to consent 0351-3 is made.

All officers will comply with the biosecurity measures that have been put in place at the piggery to ensure officers can carry out their duties in full. An example of a biosecurity measure is footbaths, overalls, boot covers, hand washing facilities, and exclusion zones. NZ Pork recommends a stand down period of 24 hours between farm visits although a 48 hour period is recommended where practical. Guidelines recommended by NZ Pork are to prevent the spread of disease. All warranted Council officers have a right enter a site under Section 332 of the RMA for the purpose of inspection to determine whether the RMA, any regulations, a rule of a plan, a resource consent is being complied with.

Consent **0351-3** expired on 1 June 2015 and an application to renew the consent has been applied for. Section 124 of the RMA allows the consent holder to operate on the existing consent until such times a new consent has been granted.

The future Regional Fresh Water Plan (RFP) will have a major effect in the way effluent is discharged. The plan is likely to that discharge to water will cease and that all effluent will be applied to land.

### 3.2 Exercise of air consent

Operations at the piggery had previously (Meadowvale Piggery) resulted in some odour emanating off site from time to time. Odour has been the result of general operations and adverse weather conditions. As the piggery is located on a small site within a residential area in Midhurst there is no real buffer zone.

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

**Frequency:**

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

**Intensity:**

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

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

**Duration:**

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

**Offensiveness:**

- A rating of an odours pleasantness or unpleasantness (“hedonic tone”).
- This does not necessarily have the same meaning as offensiveness in the RMA or consent conditions.
- A subjective assessment which can vary between individuals, but which must also be based 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 industries 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.

In the 2015-2016 monitoring period, the Council had received a total of three (two odour and one effluent discharge) alleged complaints concerning the Company regarding odour, sump overflows and discharges of pig effluent to water. All these

complaints were investigated and found that no 'objectionable' and or 'offensive' odour was found to be emanating beyond the piggery boundary nor were there any unauthorised discharges from the effluent treatment system discharging into the receiving waters.

### 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 6 and 7.

**Table 6** Summary of performance for consent 0351-3

<b>Purpose: To discharge treated piggery effluent to Rumkeg Creek and land</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Operation and discharge in accordance with application	Inspections of data and discharge point inspections	Yes
2. Concentration limits upon potential contaminants in discharge	Physicochemical sampling	Yes
3. Maximum increase in turbidity after mixing	Physicochemical sampling	Yes
4. Constituents not permitted in receiving water after mixing	Monitoring inspections of receiving water	Yes
5. Operation and maintenance of treatment and discharge system	Monitoring inspections	Yes
6. Minimum dilution rate in receiving waters	Discharge records received by Council	Yes
7. Records of discharge	Discharge records received by Council	Yes
8. Riparian fencing and planting	Monitoring inspections and liaison with the consent holder	N/A
9. Maximum total nitrogen application to land	Not yet accessed by Council	N/A
10. Maximum total potassium application to land	Not yet accessed by Council	N/A
11. Proximity of discharge to dwelling or water body	Monitoring inspections	Yes
12. Contamination of surface water not permitted from land irrigation	Monitoring inspections	Yes
13. Extended surface ponding not permitted	Monitoring inspections (sump overflow)	No
14. Discharge to land	Liaison with consent holder	No
15. Maximum discharge to land over water	Records and monitoring inspections	No
16. Optional review process	Consent expired June 2015	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>Good</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 7** Summary of performance for consent 5249-2

<b>Purpose: To discharge emissions into the air and waste management activities</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Total number of pigs allowed	Liaison with consent holder	Yes
2. Operation and air discharge in accordance with application	Monitoring inspections	Yes
3. Consultation and approval prior to alterations to plant or process	Liaison with consent holder	Yes
4. Minimise emissions and impacts of contaminants discharged to air	Monitoring inspections	Yes
5. Objectionable odour at or beyond the boundary	Monitoring inspection and incident investigations	Yes
6. Optional review provision	Next 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>

During the year, the Company demonstrated an overall good level of environmental and high level of administrative performance with the resource consents as defined in Section 1.1.4.

### 3.4 Recommendations from the 2014-2015 Annual Report

In the 2014-2015 Annual Report, it was recommended:

1. THAT monitoring of air emissions from the NZ Pure Bred Genetics Ltd piggery in the 2015-2016 year continue at the same level as in the 2014-2015 period and that the consent holder minimises the impact of discharges to air by adopting the appropriate odour management and odour control practices.
2. THAT monitoring of wastewater discharges from the NZ Pure Bred Genetics Ltd piggery in the 2015-2016 year continues as in the 2014-2015 period with provision for an extra sampling run to be undertaken if the downstream receiving waters are showing signs of adverse environmental effects.
3. THAT the piggery inspections in the 2015-2016 period remain at three inspections as in the 2014-2015 period and these inspections to be carried out four-monthly.
4. THAT the consent holder be advised that maximisation of land discharge should be complied with, and that close attention be given to maintenance of sufficient dilution of any discharge of treated wastes in the receiving waters to prevent the development of any 'undesirable biological growths' on the bed of Rumkeg Creek.
5. THAT the consent holder provides the Council with details of the location of areas to be irrigated with piggery wastes and provides records as required by special condition 14 of Consent **0351-3**.

6. THAT the biomonitoring survey for the 2015-2016 period in the Rumkeg Creek discontinues but with provision for biomonitoring to be undertaken if the downstream receiving waters are showing signs of adverse environmental effects.
7. THAT the consent holder provides the Council with details on any future piggery production increase.

Recommendation 1- Was achieved during the routine compliance monitoring inspections. Two complaints investigated by Council officers found no 'objectionable' and or 'offensive' odour emanating beyond the boundary.

Recommendation 2 - Monitoring the wastewater and receiving waters was carried out on two occasions. The monitoring program allows for two sampling runs and there was no requirement to undertake an additional sampling run.

Recommendation 3 - Four compliance monitoring inspections were carried out (including two visits to undertake monitoring of the wastewater and receiving water).

Recommendation 4 & 5 - Desludging of the anaerobic or aerobic pond was not required. Spray irrigating effluent to land was not achieved due to an ongoing dispute between the landowner and consent holder. No undesirable biological growths were found to be growing on the bed of Rumkeg Creek.

Recommendation 6 - The Council recommended a biomonitoring survey of the receiving waters was not required as discharge occasions were minimal and stock numbers were significantly decreased.

Recommendation 7 - Achieved – production increase had been reported to Council

### **3.5 Alterations to monitoring programmes for 2016-2017**

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA, its obligations to monitor emissions/discharges and effects under the RMA, and report 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 emitting to the atmosphere/discharging to the environment.

In consideration of the Company's environmental performance in regard to treated wastewater discharge and its effects, it is proposed that for 2016-2017 that the Council continues at three monitoring inspections of the piggery per year.

It is also recommended that provision be made for physicochemical impact monitoring to continue twice per year, under normal stream flow and wastewater discharge conditions with an extra sampling run to be undertaken if the downstream receiving waters are showing signs of adverse effects, (i.e. presence of sewage fungus in Rumkeg Creek or high waste loadings from the treatment pond system).

It is also recommended that a biomonitoring survey of the Rumkeg Creek is discontinued for the 2016-2017 monitoring period but may again be reinstated depending on the future expansion of the piggery and also the frequency of wastewater discharges to the receiving water.

It is also recommended that the consent holder engages a qualified consultant regarding effluent discharge to land and water in line with the likely changes to the Regional Freshwater Plan and to assist consent renewal processing.

### **3.6 Exercise of optional review of consent**

Resource consent 0351-3 (discharge to water and land) was last reviewed in July 2009 and does not provide for any further optional review of the consent. Consent 0351-3 expired in June 2015.

Resource consent 5249-2 (discharge to air) was not reviewed in June 2015. The next review date is June 2021. Consent 5249-2 expires in June 2027.

## 4. Recommendations

1. THAT monitoring of air emissions from the NZ Pure Bred Genetics Ltd piggery in the 2016-2017 year continue at the same level as in the 2015 - 2016 period and that the consent holder minimises the impact of discharges to air by adopting the appropriate odour management and odour control practices.
2. THAT monitoring of wastewater discharges from the NZ Pure Bred Genetics Ltd piggery in the 2016-2017 year continues as in the 2015-2016 period with provision for an extra sampling run to be undertaken if the downstream receiving waters are showing signs of adverse environmental effects.
3. THAT the piggery inspections in the 2016-2017 period remain at three inspections as in the 2015-2016 period and these inspections to be carried out four-monthly.
4. THAT the consent holder be advised that maximisation of land discharge should be complied with, and that close attention be given to maintenance of sufficient dilution of any discharge of treated wastes in the receiving waters to prevent the development of any 'undesirable biological growths' on the bed of Rumkeg Creek.
5. THAT the consent holder provides the Council with details of the location of areas to be irrigated with piggery wastes and provides records as required by special condition 14 of Consent **0351-3**.
6. THAT the consent holder provides the Council with details on any future piggery production increase.
7. THAT the consent holder engages a qualified consultant regarding effluent discharge to land and water in line with the potential future RFWP requirements and to assist the Consent renewal processing.

## Glossary of common terms and abbreviations

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

Biomonitoring	Assessing the health of the environment using aquatic organisms.
BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
BODF	Biochemical oxygen demand of a filtered sample.
Bund	A wall around a tank to contain its contents in the case of a leak.
CBOD	Carbonaceous biochemical oxygen demand. A measure of the presence of degradable organic matter, excluding the biological conversion of ammonia to nitrate.
cfu	Colony forming units. A measure of the concentration of bacteria usually expressed as per 100 millilitre sample.
COD	Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m.
Cumec	A volumetric measure of flow- 1 cubic metre per second (1 m <sup>3</sup> s <sup>-1</sup> ).
DO	Dissolved oxygen.
DRP	Dissolved reactive phosphorus.
E.coli	Escherichia coli, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Ent	Enterococci, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre of sample.
FC	Faecal coliforms, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Fresh	Elevated flow in a stream, such as after heavy rainfall
g/m <sup>2</sup> /day	grams/metre <sup>2</sup> /day.
g/m <sup>3</sup>	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.

IR	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 <sup>2</sup>	Square Metres.
MCI	Macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats.
mS/m	Millisiemens per metre.
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
NH <sub>4</sub>	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.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
Turb	Turbidity, expressed in NTU.
UI	Unauthorised Incident.

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

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Taranaki Regional Council 2005: Meadowvale Stud Farm Piggery Monitoring Programme  
Annual Report 2004-2005 Technical Report 2005-60.

Taranaki Regional Council 2004: Meadowvale Stud Farm Piggery Monitoring Programme  
Annual Report 2003-2004 Technical Report 2004-75.



## **Appendix I**

**Resource consents held by  
NZ Pure Bred Genetics Ltd Piggery**  
(For a copy of the resource consent  
please contact the TRC consent department)



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

Name of Consent Holder: NZ Pure Bred Pig Genetics Limited  
131 York Road  
R D 24  
STRATFORD 4394

Decision Date (Change): 27 July 2009

Commencement Date (Change): 27 July 2009 (Granted: 5 September 2003)

**Conditions of Consent**

Consent Granted: To discharge treated piggery effluent from an oxidation pond treatment system into Rum Keg Creek a tributary of the Manganui River in the Waitara catchment (during high flow conditions) at or about (NZTM) 1708745E-5650801N and to discharge treated piggery effluent onto and into land at or about (NZTM) 1708434E-5650801N

Expiry Date: 1 June 2015

Review Date(s): June 2010

Site Location: Mountain Road, Stratford

Legal Description: Lot 2 DP 405477, Lot 2 DP 20963 Pt Sec 125, Sec 22 Manganui Dist Blk XIII Huiroa SD

Catchment: Waitara

Tributary: Manganui  
Rum Keg Creek

*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

#### Condition 1 (changed)

1. The consent holder shall, at all times, operate the piggery and associated activities and discharges in accordance with the information provided in support of applications 1959 and 6284, except as otherwise required or directed by the conditions set out in this resource consent.

#### Discharge to Water - conditions 2 - 8 (unchanged)

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

Constituent	Concentration
Unionised ammonia	0.025 gm <sup>3</sup>
Filtered carbonaceous BOD <sub>5</sub>	2.0 gm <sup>3</sup>

3. After allowing for reasonable mixing within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not give rise to an increase in turbidity of more than 50% in the Rum Keg Creek.
4. That after allowing for reasonable mixing, within a mixing zone extending 50 metres below the discharge point, the discharge shall not give rise to any of the following constituents in the receiving water:
  - i) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended solids;
  - ii) any conspicuous change in colour or visual clarity;
  - iii) any emission of objectionable odour;
  - iv) the rendering of fresh water unsuitable for consumption by farm animals;
  - v) any significant adverse effects on aquatic life, habitats or ecology.

## Consent 0351-3

5. The consent holder shall operate and maintain the treatment and discharge system to ensure that the conditions of this consent are met.
6. A minimum dilution rate of 1 part effluent to 250 parts receiving water shall be maintained at all times in the receiving water at the point of discharge during discharge events.
7. The consent holder shall monitor and maintain records of the discharge, including date, rate, and duration of discharge to the Rum Keg Creek, and the staff gauge reading at the site. These records shall be made available to the Taranaki Regional Council, quarterly (September 30, December 31, March 31, and June 30).
8. The 600 metres section of Rum Keg Creek on the property shall be riparian fenced and planted within 3 years, with at least one third of the planting and fencing to be undertaken each year.

### **Discharge to Land - conditions 9 - 10 (changed)**

9. Over any 12 month period the amount of Total Nitrogen applied to land as a result of the discharge shall be no more than 200 kg per hectare of land used for effluent application over that period.
10. Over any 12 month period the amount of Potassium applied to land as a result of the discharge shall be no more than 100 kg per hectare of land used for effluent application over that period.

### **Conditions 11 - 15 (unchanged)**

11. No contaminants shall be discharged within 150 metres of any dwelling, nor within 50 metres from any bore, well or spring used for water supply purposes, nor within 25 metres of any surface water body.
12. The discharge shall not result in any discharge of contaminants to surface water.
13. The discharge shall not result in any ponding on the surface which remains for more than 3 hours after the discharge has ceased.
14. The consent holder shall monitor and maintain records of the discharge, including date, application area, rate, and duration of discharge. These records shall be made available to the Taranaki Regional Council, quarterly (September 30, December 31, March 31, and June 30).
15. The discharge to land shall be maximised and be used in preference to discharge to water.

**Review - condition 16 (unchanged)**

16. 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 2010, 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.

Transferred at Stratford on 1 December 2012

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: NZ Pure Bred Pig Genetics Limited  
131 York Road  
R D 24  
STRATFORD 4394

Decision Date: 27 July 2009

Commencement  
Date: 27 July 2009

**Conditions of Consent**

Consent Granted: To discharge emissions into the air from a pig farming activity and associated activities, including solids composting, effluent treatment and irrigation and other waste management activities at or about (NZTM) 1708696E-5650669N

Expiry Date: 1 June 2027

Review Date(s): June 2015, June 2021

Site Location: 3084 Mountain Road, Midhirst, Stratford

Legal Description: Lot 2 DP 405477, Lot 2 DP 20963 Pt Sec 125, Sec 22  
Manganui Dist Blk XIII Huiroa SD

*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 2500 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.

Consent 5249-2

6. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2015 and/or June 2021, 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.

Transferred at Stratford on 1 December 2012

For and on behalf of  
Taranaki Regional Council



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**Director-Resource Management**



## **Appendix II**

### **Flow rating for Rumkeg Creek**



# Rumkeg Creek above Confluence

River Height vs Flow Values

Prepared for NZ Pure Bred Genetics Ltd piggery

A staff gauge has been installed on the Rumkeg Creek Denbigh Road Bridge for monitoring of the river level (or height).

Table 1 shows river levels at this bridge and the corresponding flow for each level. All flows are expressed in litres per second.

River Level	Flow (litres/second)	River Level	Flow (litres/second)
0.1	20	0.5	2,726
0.11	24	0.51	2,959
0.12	29	0.52	3,205
0.13	34	0.53	3,465
0.14	39	0.54	3,739
0.15	46	0.55	4,036
0.16	54	0.56	4,350
0.17	62	0.57	4,681
0.18	72	0.58	5,028
0.19	82	0.59	5,393
0.2	95	0.6	5,789
0.21	110	0.61	6,207
0.22	126	0.62	6,647
0.23	144	0.63	7,109
0.24	164	0.64	7,592
0.25	189	0.65	8,098
0.26	216	0.66	8,625
0.27	246	0.67	9,174
0.28	279	0.68	9,744
0.29	315	0.69	10,337
0.3	359	0.7	10,991
0.31	406	0.71	11,674
0.32	459	0.72	12,386
0.33	516	0.73	13,127
0.34	577	0.74	13,897
0.35	648	0.75	14,695
0.36	725	0.76	15,523
0.37	808	0.77	16,380
0.38	897	0.78	17,266
0.39	993	0.79	18,181
0.4	1,100	0.8	19,180
0.41	1,217	0.81	20,219
0.42	1,341	0.82	21,296
0.43	1,474	0.83	22,413
0.44	1,615	0.84	23,568
0.45	1,772	0.85	24,763
0.46	1,939	0.86	25,996
0.47	2,118	0.87	27,269
0.48	2,307	0.88	28,581
0.49	2,507	0.89	29,932



At 0.40m (river level) the flow is

River Level	Flow (litres/second)
0.9	31,365
0.91	32,845
0.92	34,372
0.93	35,946
0.94	37,567
0.95	39,235
0.96	40,950
0.97	42,712
0.98	44,520
0.99	46,376
1.00	48,591

