



STAFF REPORT

TO: Environment & Planning Subcommittee

FROM: Rob Lieffering, Co-ordinator Resource Consents

REFERENCE: RM060742 and RM061007

SUBJECT: **TASMAN LIMITED - REPORT EP07/04/04** - Report prepared for 23 and 24 April 2007 hearing

1. INTRODUCTION

My name is Robert Lieffering and I hold the position of Co-ordinator Resource Consents within the Council. I hold the qualifications of Doctor of Philosophy (PhD) in Earth and Soil Science from Waikato University, a Masters of Science (Honours) in Soil Science and Bachelor of Science in Earth Sciences both from Massey University. I have seven years experience in environmental research (hydrogeology and soil physics and chemistry) and over eleven years of local government work experience in environmental investigations and resource consent processing/planning.

Prior to being employed at Tasman District Council I worked for Northland Regional Council for seven years as the Water and Wastes Team Leader, and prior to this worked for Tonkin and Taylor Environmental and Engineering Consultants Ltd and Marlborough District Council.

I have undertaken many technical assessments of wastewater treatment and disposal systems, ranging from on-site wastewater treatment disposal systems through to municipal treatment plants. These assessments have been for the purpose of reporting and making decisions on discharge permit applications under the Resource Management Act.

2. THE APPLICATION

Tasman Limited ("the applicant") has applied for a suite of resource consents associated with the development of land at Stringer Road, Stringer Valley. This report covers two discharge permit applications as follows:

Application **RM060742**: To discharge up to 121.7 cubic metres of treated wastewater per day to land by way of pressure compensating dripper irrigation.

Application **RM061007**: To discharge contaminants, primarily odorous compounds, to air from the operation of a wastewater treatment plant and from wastewater disposal areas.

The applicant engaged the services of Glass Potts Fowler (GPF) to assist with the design of the wastewater treatment and disposal system. GPF prepared a report on the design and this is Appendix 7 of the application. In addition, GPF prepared a response to a request for further information (Section 92 request) and this too is presented in Appendix 7 of the application.

Zoning

The land is zoned Rural 3 according to the proposed Tasman Resource Management Plan (TRMP) but this has little relevance to the two discharge permit applications described above. However, the land is located within the Wastewater Management Area (WMA) according to the TRMP.

Activity Status

The proposed discharge of treated wastewater to land is considered to be a restricted discretionary activity in accordance with Rule 36.1.14A of the TRMP as it meets all the relevant criteria of that rule. However, it should be noted that criterion (l) of Rule 36.1.14A has important implications in respect of this application. Criterion (l) requires that for a discharge to be a restricted discretionary activity “*The wastewater is distributed evenly into the disposal field at a rate not exceeding 2 millimetres per day **except where the soil category is assessed as being Category 6***” (emphasis added). Category 6 soils are the slowest draining soils according to the soil classification system presented in AS/NZS1547:2000. The soils of the proposed disposal areas have been classified as Category 6 and the proposed application rate exceeds 2 millimetres per day (mm/day), but because this criterion specifically excludes Category 6 soils, the 2 mm/day restriction does not apply. There are no further criteria mentioned in Rule 36.1.14A which relate to Category 6 soils. The implications of the current wording of criterion (l) is that if a person wished to apply wastewater at a rate greater than 2 mm/day on Category 1-5 soils in the WMA their activity would be deemed to be a non-complying activity (as it can not meet criterion (l) of the rule) but the discharge of wastewater at greater than 2 mm/day on Category 6 soil would remain restricted discretionary. One would expect that there would have been a more restrictive criterion in Rule 36.1.14A for Category 6 soils, but since there is not the status of the proposed discharge to land remains restricted discretionary.

Regarding the discharge of contaminants to air, the wastewater treatment plant and the disposal areas are deemed to be premises used for the “*treatment and disposal of waste*” and as such are one of the types of premises specified in Rule 36.3.10 of the TRMP and as such the activity is deemed to be fully discretionary.

This report covers both the technical aspects of the proposed wastewater treatment and disposal system as well as an analysis of how the discharges to land and to air fit within the policy framework of the TRMP and the relevant matters of the Resource Management Act 1991 (“the Act”).

3. SITE DESCRIPTION

The site is located within Stringer Valley. The land consists of low rolling hill country rising to an elevation of around 130 metres above sea level. There are a series of northeast trending spurs with associated gullies in which there are streams which discharge into Stringer Creek which flows in an easterly direction along the northern boundary of the subject land and ultimately discharges into the Waimea Estuary, approximately 1.6 kilometres east of the site.

The land is currently used for a mixture of pastoral farming and exotic forestry. There are pockets of scrub and some of the gullies have native and introduced wetland plant species present.

4. OVERVIEW OF WASTEWATER RETICULATION, TREATMENT PLANT, AND DISPOSAL SYSTEM

The applicant proposes to install a small community wastewater collection, treatment and disposal system that will service all the dwellings and buildings of the proposed subdivision. Wastewater from the various buildings of the development will enter chambers which will have grinder pumps installed and the wastewater generated will be pumped via small diameter pipes to a central treatment plant (each allotment will have its own grinder pump). Each grinder pump will be housed in a chamber which will have a minimum reserve capacity (above the “pump on” level) of 1 cubic metre (equivalent to approximately one day’s wastewater from the dwelling).

The applicant has not undertaken any detailed assessment of the semi-intensive houses, tourist units, or the commercial facility in respect of whether these buildings will have individual or shared grinder pumps. In any case, the applicant is volunteering that the emergency storage provided in the grinder pump chamber(s) will be at least equivalent to 12 hours dry weather flow.

The wastewater treatment plant will be located on proposed Lots 202 and 204 of the subdivision (adjacent to Stringer Road). The applicant initially presented two wastewater treatment options but has confirmed that the wastewater treatment plant will utilise a technology known as a membrane bioreactor (MBR). This technology is essentially a combination of an activated sludge process (basically a suspended growth of biomass) together with a filtration system that allows only very small particles to pass through.

The treated wastewater will be discharged to land via pressure compensating dripper lines. There will be 12 disposal areas located within the common land areas of the subdivision which will be developed progressively in accordance with the proposed staging of the subdivision.

5. DESIGN ASSUMPTIONS

Wastewater Flow Volumes

The subdivision development is a mixture of residential dwellings, semi-intensive residential villas, tourist accommodation units, and a commercial building. As such, wastewater will be generated by both residential and visiting populations.

The applicant has presented a detailed assessment of the wastewater flow volumes likely to be generated by the development. This assessment concludes that during the peak summer period (92 days) the maximum daily wastewater volumes likely to be generated will be 121.7 cubic metres and during the remainder of the year 83.1 cubic metres per day of wastewater would be generated.

Accurately predicting the daily wastewater volumes for such a development can be difficult but estimates are typically based on per capita wastewater flow allowances and the number of habitable rooms for buildings where people will be sleeping, together with patronage figures for the commercial complex.

There is no New Zealand standard or guideline for designing decentralised wastewater treatment systems and therefore there is no standard method that “*should*” be used to calculate design flows. Decentralised systems fall in between individual on-site systems and municipal systems for which design standards are available.

Dwellings

The applicant has assumed that throughout the year there would be 3 persons permanently resident in each dwelling of the subdivision and a daily wastewater allowance of 220 litres per person per day has been used in the design. The applicant has based the 3 persons per house on Statistics New Zealand data which suggests that the average household size in Tasman District is 2.5 persons per dwelling (rounded up to 3 persons per dwelling by the applicant).

In addition, during the peak summer period an additional 2 persons have been assumed to be present in each dwelling with these additional persons generating 150 litres of wastewater per day. Therefore, during the peak summer period the wastewater generated from each house has been assumed to be 960 litres per day (equivalent to 192 litres per person per day). This figure is considered to be appropriate and similar to the 900 litres per day calculated using the figures in AS/NZS1547:2000 (5 persons per house and 180 litres per person per day).

Therefore, the applicant has assumed that during the summer peak the 80 dwellings of the subdivision will generate 76.8 cubic metres of wastewater per day and 52.8 cubic metres per day during the remainder of the year.

Semi-intensive Residential Villas

The applicant proposes to construct 41 semi-intensive residential villas (referred to as “Apartments” in the GPF report). Each semi-intensive residential villa has three bedrooms and can therefore be expected to house up to six persons at full occupancy. The applicant has, however, assumed an average occupancy of four persons for the semi-intensive residential villas during the peak summer period and a lower average occupancy of two persons per semi-intensive residential villa during the remainder of the year. The applicant has assumed a wastewater allowance of 220 litres per person per day for the first two persons staying in the semi-intensive residential villas and a lesser figure of 150 litres per person per day for the additional two persons during the summer peak period. This equates to an average wastewater allowance of 185 litres per person per day during summer and 220 litres

per person per day during the remainder of the year. These figures are considered to be appropriate.

Therefore, the applicant has assumed that during the summer peak the 41 semi-intensive residential villas will generate 30.3 cubic metres of wastewater per day and 18.0 cubic metres per day during the remainder of the year.

Tourist Accommodation Units

The applicant proposes to construct 15 tourist accommodation units (referred to as "Studios" in the GPF report). Each tourist accommodation unit has two bedrooms and can therefore be expected to house up to four persons at full occupancy. The applicant has, however, assumed an average occupancy of three persons for the apartments during the peak summer period and a lower average occupancy of two persons per apartment during the remainder of the year. The applicant has assumed a wastewater allowance of 220 litres per person per day for the first two persons staying in the units and a lesser figure of 150 litres per person per day for the addition person during the summer peak period. This equates to an average wastewater allowance of 197 litres per person per day during summer and 220 litres per person per day during the remainder of the year. These figures are considered to be appropriate.

Therefore, the applicant has assumed that during the summer peak the 15 tourist accommodation units of the subdivision will generate 8.9 cubic metres of wastewater per day and 6.6 cubic metres per day during the remainder of the year.

Commercial Building

The commercial building will contain a restaurant/café with associated kitchen, a bar, a store, a meeting room, and an administration office. The design capacity of the café and bar will be 170 people, with approximately 60 dining seats. The meeting room will have a capacity for 29 people and 10 staff would be working in the building.

The applicant has used the figures in Table 1 to calculate the expected wastewater flows from the commercial facility throughout the year (i.e. there is no difference in summer peak loads):

Table 1. Expected wastewater flows from commercial building

Area	Number of people	Wastewater allowance (litres per person per day)	Wastewater volume (cubic metres per day)
Staff	10	40	0.4
Restaurant/café	120 ^(see note 1)	30	3.6
Bar	50	25	1.25
Meeting room	29	15	0.44
TOTAL			<u>5.69</u>

Note 1: Assumes two sittings of 60 persons per sitting (being the seating capacity)

The wastewater allowances used by the applicant come from AS/NZS1547:2000 and are considered to be appropriate.

Summary of Wastewater Flows

Table 2 summarises the applicant's design wastewater flows:

Table 2. Summary of expected wastewater flows from entire development.

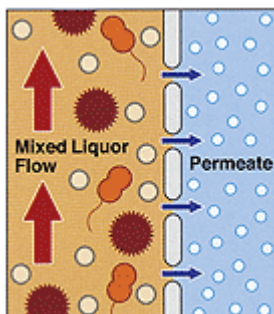
Wastewater Source	Summer Peak (cubic metres per day)	Remainder of Year (cubic metres per day)
Residential dwellings	76.8	52.8
Semi-intensive Residential Villas	30.3	18.0
Tourist Accommodation Units	8.9	6.6
Commercial building	5.7	5.7
Total	121.7	83.1

6. WASTEWATER TREATMENT PLANT AND EXPECTED WASTEWATER QUALITY

The applicant proposes to install a membrane bioreactor (MBR) system to treat the wastewater from all the sources. An MBR is basically an activated sludge process together with a micro- or ultra-filtration system.

The membrane filtration system replaces the clarifier system traditionally used in activated sludge treatment systems. The wastewater typically requires only primary settlement, to remove grit and larger solids, or screening before entering the MBR system.

Filtration of the wastewater occurs through a series of membranes which have a very small effective pore size (typically less than 0.1-0.4 micrometres) and during operation the effective pore size decreases to around 0.01 micrometres due to the build up of proteins and cellular material on the membrane surfaces. This level of filtration is within the range termed "*ultrafiltration*". The activated sludge, which has a relatively high suspended solids concentration (referred to as "mixed liquor"), flows past the membrane and only those particles less than the effective pore size of the membrane are allowed to cross the membrane. The filtered component is referred to as the "permeate". The following diagram shows schematically how the membrane works.



The membranes typically hang as sheets within a tank which holds the activated sludge. Commonly air diffusers are located at the bottom of the tank and this provides a cross flow of air bubbles across the membrane to reduce fouling of the membrane surface.

The permeate is extracted by way of narrow tubes and the liquid is directed to a storage tank where it can be pumped to the disposal field.

No disinfection of the permeate is required because the effective pore size of the membranes are such that viruses, bacteria, and other pathogenic organisms are prevented from crossing the barrier.

There have been few MBR systems constructed in New Zealand to date, but the technology has been used overseas for a number of years. The treated wastewater is expected to meet the following standards:

Table 3. Expected quality of treated wastewater.

Determinand	Expected Concentration <small>(see Note 1)</small>
Five day biochemical oxygen demand (BOD ₅)	<5 g/m ³
Total suspended solids (TSS)	<5 g/m ³
Total nitrogen	<10 g/m ³ <small>(see Note 2)</small>
Total phosphorous	<1 g/m ³
Faecal coliforms	0 cfu per 100 mL <small>(see Note 3)</small>

Note 1: The applicant presents these figures in the application and advises that they are sourced from Oasis Clearwater Environmental Systems Limited, being a supplier of Kubota MBR systems in New Zealand.

Note 2: According to Oasis Clearwater Environmental Systems Limited's website, typical system performance for total nitrogen is <5 g/m³.

Note 3: According to Oasis Clearwater Environmental Systems Limited's website the concentration is listed as "Typically zero". A rival MBR system produced by Hynds Environmental suggests that the geometric mean concentration for faecal coliforms is <5 cfu/100 mL with a maximum of 25 cfu/100 mL. The applicant, in the Section 92 response letter, suggests a figure of <100 cfu/100 mL

Irrespective of which of the figures (either those quoted by either the applicant or the manufacturers who supply MBRs in New Zealand) are used, the quality of the treated wastewater is considered to be very high and the expected concentrations would be difficult to achieve using any other commonly-used treatment technology.

7. WASTEWATER DISPOSAL DESIGN

Soil Types

The treated wastewater will be discharged to land via pressure compensating dripper lines. There will be 12 disposal areas located within the common land areas of the subdivision which will be developed progressively in accordance with the proposed staging of the subdivision.

The soils of the disposal area consist of a mixture of Braeburn sandy loams, Mapua sandy loams, and Mapua hill soils. The Braeburn sandy loam soils are typically poorly drained and of low fertility, occupying the lower valley floor parts of the subject site. The Mapua sandy loam soils typically have a sandy loam topsoil which is easily eroded and this has resulted in much of the upper slopes being devoid of the topsoil, which has accumulated on the lower slopes and gullies. They generally have impeded drainage with gleyed clay subsoils. The Mapua hill soils are located on the steeper parts of the site and are related to the Mapua sandy loam soils but are generally shallower.

The applicant has undertaken a soil assessment which included the excavation of 23 test pits. The applicant has classified the soils as being “*on the border between Category 5 and 6*” but has conservatively taken the approach of considering them to all be Category 6 soils, in accordance with AS/NZS1547:2000.

Design Irrigation Rates

The applicant initially used a design irrigation rate (DIR) of 2 millimetres per day (equivalent to 2 litres per square metre per day) and therefore set aside 6.08 hectares for land disposal. No reserve area was provided in the original design. The applicant was requested to undertake further hydraulic testing of the soils to justify the proposed DIR. The further testing involved measuring the near saturated hydraulic conductivity ($k_{-40\text{mm}}$) using a disc permeameter. Fifteen such measurements were made on a mixture of topsoil and subsoils at various locations. Near saturated hydraulic conductivity measurements provide a better indication of the ability of the soils matrix to transmit (waste)water and removes the effects of macropore flow (eg worm holes, large cracks etc). The suction used (-40 millimetres) means that the results reflect the hydraulic conductivity of all the pores with an effective diameter of less than 0.75 millimetres.

The results of the unsaturated hydraulic conductivity testing confirmed that the subsoils are poorly draining with a measured k_{-40} range of 1.5-11.25 millimetres per hour (36-270 millimetres per day). The applicant considers that, given the high level of pre-treatment the wastewater receives before being discharged, that an appropriate DIR would be 10% of the lowest k_{-40} measurement (i.e. 10% of 36 mm/day = 3.6 mm/day DIR, rounded down by the applicant to 3.5 mm/day). The DIR was therefore increased from 2 millimetres per day to 3.5 millimetres per day. As a result of this higher DIR, the area of land set aside for disposal was reduced to 3.48 hectares, however the applicant has stated that remaining 2.6 hectares which was originally set aside will be designated as reserve areas should they be needed (this equates to a 75% reserve area).

It should be noted that there is no nationally or internationally accepted “standard” method to convert measured k_{-40} rates to DIRs. There are a number of references which provide some guidance on the subject. For example, Sparling *et al* (2004)¹ states that “*The irrigation rate must **always** be less than the near saturated hydraulic conductivity (k_{-40})*”, however they do not state **how much** lower the rate should be. Interestingly, Sparling *et al* (2004)¹ present a different approach to that of the applicant in that they calculate the geometric mean of all the measured k_{-40}

¹ Sparling GP, McLeod M, and Schipper LA. (2004). Soil Characteristics and target ranges to monitor soils for sustainable land treatment of effluents. New Zealand Land Treatment Collective Technical Review Number 25.

measurements, whereas the applicant has based their DIR on a percentage of the lowest measurement. The historic method to determine DIRs, which is considered to be somewhat outdated, is the USEPA (1981) method which recommends that the DIR be between 4-10% of the saturated hydraulic conductivity (k_s), with 4% being used as the default conversion rate. No conversion factor is presented by USEPA for unsaturated hydraulic conductivity measurements.

The applicant also advises that the methodology used to convert near saturated hydraulic conductivity measurements to DIR has been used in the Auckland region recently. However this exercise was for different reasons than is the case here.

It is my opinion that, in the absence of any standard method of converting near saturated hydraulic conductivities to DIRs, the approach taken by the applicant is appropriately conservative for the following reasons:

- The wastewater will be treated to a very high standard prior to being discharged;
- The DIR of 3.5 millimetres per day will be the peak loading rate, likely to occur only when there is full occupancy of all the buildings of the development. For the bulk of the time the actual loading rate will be significantly less than 3.5 millimetres per day. During the non-summer peak period the loading rate at full expected occupancy would equate to 2.4 millimetres per day.
- The peak loading will occur during summer months when the soils will be at their driest and when evapotranspiration is at its greatest;
- A reserve area equivalent to ~75% of the primary disposal area(s) has been designated to be used should this be necessary; and
- In addition to the designated reserve area(s), the subject property is very large and as such, should additional land be require to dispose of the wastewater then this can/should be available.

Method of Disposal

The applicant proposes to discharge the wastewater within the disposal areas using pressure compensating dripper lines. These will be buried to a depth of 150 millimetres. Whilst no detailed design has been undertaken on the disposal areas, the applicant has confirmed that the irrigation lines will be placed parallel to the contours, 1 metre apart, and each dripper will be located at 0.6 metre intervals along the line. The instantaneous flow rate per dripper will be between 1.6-2.3 litres per hour. It is my view that, given the soil types of the proposed disposal areas, that the instantaneous discharge rate be no more than 1.6 litres per hour. Should consent be granted I recommend that this be a condition of consent.

8. ENVIRONMENTAL EFFECTS OF DISCHARGE TO LAND

The expected wastewater quality following treatment through the MBR treatment system is summarised Table 3 above.

These data indicate that the proposed treatment will result in a very high quality wastewater. The wastewater will receive further treatment when it is applied to the soil through reactions and utilisation by micro-organisms present in the soil. The vegetation planted in the disposal area will utilise a proportion of the nutrients

(particularly nitrogen and phosphorous compounds) applied through the wastewater, thereby reducing the likelihood of leaching of these nutrient to the groundwater.

The quantity of heavy metals or pesticides being discharged to the environment will be very low given that the wastewater will be from domestic sources. The BOD₅ loading onto the soils will be very low (~0.175 kilograms per hectare per day at peak loading) whereas soils can easily assimilate rates which are three orders of magnitude greater than this.

In terms of bacteria and viruses, the MBR technology will effectively remove close to 100% of these. Further renovation (die off) will occur during migration of the wastewater through the soil. The risk of adverse effects associated with bacteria and viruses in the receiving environment will be extremely low.

Nitrogen is predominantly in the form of ammonia (NH₃) in raw wastewater and through the aerobic treatment process this is converted primarily to nitrate (NO₃). Nitrate can be readily leached into groundwater and can adversely affect receiving waters. Predicting likely nitrogen leaching is possible using modelling software. The applicant has used a model known as OVERSEER to predict likely nitrogen leaching beneath the disposal areas. Although Table 3 suggests that the total nitrogen concentration will be less than 5 grams per cubic metre, the applicant initially used a conservative figure of 25 grams per cubic metre as the input for the model, but this model was run using the initial DIR of 2 millimetres per day. The applicant did not re-run the model based on the increased DIR of 3.5 millimetres per day. However, the Council has a copy of this model and has re-run the simulation with the increased DIR scenario. These results have also been compared with the predicted nitrogen leaching under sheep and beef pastoral farming. In addition, the model was run using the following nitrogen concentrations in the wastewater: 25 g/m³ (worst case scenario), 20 g/m³ (upper end considered realistic by the applicant), 10 g/m³ ("typical" performance figure claimed by the applicant and also the figure quoted as the maximum by Hynds for their MBR), and 5 g/m³ (typical concentration claimed by Oasis for their MBR on their website). Table 4 presents a summary of the nitrogen leaching that is predicted by OVERSEER under these various scenarios.

Table 4. Predicted nitrogen leaching under various scenarios using OVERSEER

Scenario		Annual nitrogen loading (kgN/Ha/yr)	Annual nitrogen leaching (kgN/Ha/yr)
Design irrigation rate (mm/day)	N Concentration in wastewater (g/m ³)		
2	25	143	4
3.5	25	244	7
	20	195	6
	10	97	4
	5	49	4
Pastoral Grazing			
Sheep & beef - No fertiliser		0	8
Sheep & beef - 20 kg N/Ha/yr Fertiliser		20	9

Table 4 suggests that for all the irrigation scenarios nitrogen leaching as a result of the treated wastewater being irrigated will be less than if the land were used for sheep and beef farming. It should be noted that the irrigation scenarios were run with an assumption that there would be no additional nitrogen from stock, as the

application states that no stock will be grazed on the irrigation areas. It should also be noted that under the TRMP a person may discharge up to 200 kilograms of nitrogen per hectare per year as animal effluent (by itself or in combination with other fertilisers) as a permitted activity.

Summary

Given the high level of treatment, it is unlikely that groundwater or surface water quality will be adversely affected by the discharge to land. There are no known users of groundwater between the discharge areas and the streams that flow through the property.

9. MITIGATION MEASURES

To minimise the impacts of the discharge, the applicant is proposing to collect wastewater from all the buildings of the development and treat the wastewater generated at a central treatment facility to effectively a tertiary level. The treatment and disposal system proposed, if operated and maintained properly, will produce discharges that should result in adverse effects on the environment that will be no more than minor. Further treatment of the wastewater will occur within the soils of the disposal areas.

Each of the lots will have their own grinder pump housed in a minimum 1,000 litre capacity storage tank. At least 12 hours dry weather flow emergency storage is being proposed throughout the system with a 24 hour telemetered remote warning system.

The applicant is proposing to apply the treated wastewater to the soils using a scientifically based irrigation rate and there will not be any surface runoff of treated wastewater to adjacent watercourses. The applicant proposes to maintain a 20 metre horizontal separation distance between the irrigation lines and any surface water body.

10. DISCHARGE OF CONTAMINANTS TO AIR

Sources of Contaminants and Environmental Effects

The potential for odour generation from the proposed collection, treatment, and disposal system can be divided into four sources:

- Tanks used to house the grinder pumps on each allotment;
- Gas vents on effluent transfer lines;
- The wastewater treatment plant; and
- The disposal field.

The tanks which will house the grinder pumps have the potential to produce undesirable odours as they will receive untreated wastewater, however the residence time of the wastewater in the tank will be short and the wastewater will be pumped regularly to the central treatment plant. This will mean that there will be less chance of anaerobic conditions developing within the tanks, which have a greater potential to cause objectionable odours.

The effluent transfer pipes between the grinder pumps and the treatment plant can also be a source of odorous gases due to possible anaerobic biological degradation of the effluent. Any build-up of these gases is vented to atmosphere via vents. Unless properly controlled, this venting may cause offensive odours.

The treatment plant is designed so that aerobic conditions are maintained. Under aerobic environments the likelihood of odour generation is significantly less than under anaerobic conditions. The MBR will be required to be desludged every 2-3 months. The waste activated sludge (WAS) will be removed by using a vacuum tanker. The sludge, whilst reasonably stable having been partly aerobically digested, will generate some odours but the effects will be limited to the area immediately around the desludging operation.

The disposal area may produce odours if the system fails and treated wastewater ends up ponding on the surface of the soil. Odour generation in the disposal field is unlikely but any odours that are generated will be filtered by the soil material above the subsurface irrigation lines used to dispose of the wastewater.

The likely environmental effects of odour generation are on persons living in close proximity to the source of the odour. It is likely that the immediate neighbours to the site would be affected if significant odour generation occurs. This is considered an unacceptable effect and the applicant should implement mitigation measures to ensure that there are not objectionable odours at or beyond the property boundary.

Mitigation Measures

Provided the treatment and disposal system are operated and maintained, there should be no significant odour production. The following are considered to be mitigation measures in this case:

- An aerobic treatment process to be used at the central treatment facility;
- Placing the irrigation lines under the soil surface;
- Low organic loading of the soils to ensure aerobic conditions prevail; and
- Locating the treatment plant away from residential development.

In areas where odours may be generated, such as holding tanks, it is considered appropriate that the applicant installs a suitable filter on any vents should this be considered necessary to mitigate offensive or objectionable odours at residential sites. There are a number of different types of filters available with many of them utilising activated carbon which is a suitable medium to adsorb odorous gases. However, activated carbon has a limited lifetime/adsorption potential before it is rendered ineffective and so a suitable maintenance programme must be in place to replace the carbon filters as the need arises.

Odour generation in the disposal field is unlikely but any odours that are generated will be filtered by a thin layer of soil above the subsurface irrigation lines used to dispose of the wastewater.

11. CONSIDERATION OF ALTERNATIVES

The applicant presented significant information on alternatives that were considered for the treatment and disposal of wastewater at the site. Other options considered were:

- A STEP/STEG system utilising septic tanks on each allotments which either gravity feed primary treated wastewater to the central treatment facility or the wastewater is pumped from the septic tanks to the treatment plant;
- Traditional gravity flow to pump stations or direct to treatment plant;
- A large variety of wastewater treatment technologies were considered, including recirculating textile packed bed reactor, submerged aerated system, fixed activated sludge treatment, and wetland treatment;
- Evapotranspiration seepage beds for disposal;
- Constructed wetland discharging to surface water as a disposal option.

The applicant selected the grinder pump reticulation, MBR treatment technology, and pressure compensating dripper disposal option because it provided the highest level of treatment and was environmentally the best practicable option for the site.

12. SUBMISSIONS

Of the submissions received during the notification process, four related in some way to the wastewater discharges being proposed at the site. These are summarised below together with my commentary on their contents.

Submitter	Concerns Raised	Commentary
C Bostwijk	<ul style="list-style-type: none"> ▪ Where will all the waste go? ▪ As a resident on similar soils, she considers that in the winter the clay turns to a slurry and that the wastewater will "collect" and find its way down slope and ultimately into the Waimea Estuary. 	<p>The applicant has provided sufficient information to address where the wastewater will be discharged.</p> <p>The soils have been tested and the design irrigation rate is considered appropriate for the soil type.</p>
Nelson Marlborough District Health Board	<ul style="list-style-type: none"> ▪ Supports the provision of community sewage treatment and disposal facility as opposed to individual on-site treatment and disposal. 	No comment required.

E Collier	<ul style="list-style-type: none"> ▪ The proposal is effectively a village the size of Mapua in area and three times the size of Tasman village in terms of the number of dwellings, but with no urban facilities like sewerage system. This is considered “inappropriate”. 	The applicant’s proposal is considered an appropriate solution for the treatment and disposal of the wastewater likely to be generated from the development.
D Mitchell	<ul style="list-style-type: none"> ▪ Lack of clarity about the sewage treatment and disposal system to be used. ▪ Particularly concerned about the potential for pollution to affect waterways and the Waimea Estuary. 	<p>The applicant has clearly identified the technologies that will be used to treat and dispose of the wastewater. Detailed design drawings are not considered necessary at this stage of the project.</p> <p>The wastewater will be treated to a very high level before being discharged and will not result in pollution of the nearby waterways nor the Waimea Estuary.</p>

13. ASSESSMENT OF PART II, SECTION 104, AND SECTION 105 MATTERS

Part II of the Resource Management Act 1991

Important sections of Part II of the RMA relating to these applications are summarised below.

Purpose (Section 5)

The purpose of the RMA is to promote the sustainable management of natural and physical resources.

In the RMA, “*sustainable management*” means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while:

- a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations;
- b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
- c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

Matters of National Importance (Section 6)

No matters of national importance have been identified as being relevant to these applications.

Other Matters (Section 7)

In achieving the purposes of the RMA, the Council in managing the natural and physical resource shall have particular regard to:

- a) kaitiakitanga;
- b) the efficient use and development of natural and physical resources;
- c) the maintenance and enhancement of amenity values;
- d) intrinsic values of ecosystems;
- e) repealed
- f) maintenance and enhancement of the quality of the environment; and
- g) any finite characteristics of natural and physical resources.

Treaty of Waitangi (Section 8)

The Council shall take into account the principles of the Treaty of Waitangi (Te Tiriti O Waitangi).

Section 104

In considering an application for resource consent, the Council is required under Section 104 of the RMA, to have regard to a range of matters as may be relevant for any particular application. Those parts of Section 104(1) of the RMA that are relevant for these applications are:

- Any actual and potential effects on the environment of allowing the activity;
- The Tasman Regional Policy Statement;
- The proposed Tasman Resource Management Plan;

The actual and potential effects on the environment have been discussed earlier in this report. How these applications conform with the objectives and policies of both the RPS and TRMP is discussed in Section 13 of this report.

Section 105

Section 105 of the RMA also applies to these applications and requires the Council to have regard to:

- The nature of the discharge and the sensitivity of the proposed receiving environment to adverse effects and the Applicant's reasons for making the proposed choice; and

- Any possible alternative methods of discharge, including discharge into any other receiving environment.

These matters have been discussed earlier in this report.

14. ASSESSMENT OF THE OBJECTIVES AND POLICIES OF THE TASMAN REGIONAL POLICY STATEMENT AND TASMAN RESOURCE MANAGEMENT PLAN

Discharge of Wastewater to Land

Tasman Regional Policy Statement

The objectives and policies stated in the Tasman Regional Policy Statement (RPS) relevant to the discharge of treated wastewater to land are (Note: only a brief summary of the intent of each objective and policy is presented here and the reader is referred to the RPS document for the full wording):

- Objective 10.1 (Maintenance and enhancement of the quality of soils and water);
- Objective 10.2 (Avoiding, remedying, or mitigating adverse effects of contaminants of soil and water); and
- Objective 10.4 (Minimising risks of contamination arising from the storage, treatment, or disposal of wastes).
- Policy 10.2 (Adverse effects are avoided, remedied, or mitigated where there is no water classification);
- Policy 10.4 (Seek that liquid discharges be to land where this is the best practicable option);
- Policy 10.5 (Reduction of the risk of emergency discharges to land and water by requiring contingency plans); and
- Policy 10.9 (Ensuring contamination from storage, treatment, and disposal of wastes is avoided, remedied, or mitigated).

It is considered that the proposed discharge of treated wastewater to land will meet the above objectives and will be consistent with the above policies.

Tasman Resource Management Plan

The objectives and policies stated in the proposed Tasman Resource Management Plan (TRMP) relevant to the discharge of treated wastewater to land are (Note: only a brief summary of the intent of each objective and policy is presented here and the reader is referred to the TRMP document for the full wording):

- Objective 33.1.0 (Discharge of contaminants in a way that avoids, remedies, or mitigates adverse effects whilst maintaining existing water quality); and

- Objective 33.2.0 (Avoiding, remedying, or mitigating adverse effects resulting from emergency discharges or accidental spills).
- Policy 33.1.2 (To avoid, remedy, or mitigate the adverse effects of discharges so that relevant water quality classification standards are met);
- Policy 33.1.8 (Avoid, remedy, or mitigate adverse effects of non-point source contamination arising from discharge activities);
- Policy 33.1.10 (Promote and encourage discharges of waste to land in preference to water);
- Policy 33.2.1 (Promote the development of site contingency plans to avoid, remedy, or mitigate the likely adverse effects of any emergency discharges or accidental spills); and
- Policy 33.2.2 (Ensure discharge activities are carried out having regard to contingency planning measures appropriate to the nature and scale of any discharge and risk to the environment for any accidental discharge)

It is considered that the proposed discharge of treated wastewater to land will meet the above objectives and will be consistent with the above policies.

Discharge of Contaminants to Air

Tasman Regional Policy Statement

The objectives and policies stated in the Tasman Regional Policy Statement (RPS) relevant to the discharge of contaminants to air are (Note: only a brief summary of the intent of each objective and policy is presented here and the reader is referred to the RPS document for the full wording):

- Objective 10.2 (Avoiding, remedying, or mitigating adverse effects of the discharge of contaminants to air); and
- Objective 10.4 (Minimising risks of contamination arising from the storage, treatment, or disposal of wastes).
- Policy 10.3 (Adverse effects of discharges to air are avoided, remedied, or mitigated);
- Policy 10.5 (Reduction of the risk of emergency discharges to air by requiring contingency plans); and
- Policy 10.9 (Ensuring contamination from storage, treatment, and disposal of wastes is avoided, remedied, or mitigated).

It is considered that the proposed discharge of contaminants to air will meet the above objectives and will be consistent with the above policies.

Tasman Resource Management Plan

The objectives and policies stated in the proposed Tasman Resource Management Plan (TRMP) relevant to the discharge of contaminants to air are (Note: only a brief summary of the intent of each objective and policy is presented here and the reader is referred to the TRMP document for the full wording):

- Objective 34.2.0 (Discharge of contaminants in a way that avoids, remedies, or mitigates adverse effects whilst maintaining existing air quality); and
- Policy 34.2.1 (Ensure discharges to air are undertaken in a way that avoids, remedies, or mitigates adverse effects);
- Policy 34.2.2 (To provide for contaminant discharges to air while maintaining or enhancing ambient air quality);

It is considered that the proposed discharge of contaminants to air will meet the above objective and will be consistent with the above policies.

15. CONCLUSIONS

When considering the applications made to the Council, and the potential impacts of these activities on natural and physical resources, it is necessary to take into account matters raised in Part II of the Act. Section 104 also requires the Council to “*have regard to*” existing and proposed plans. It is important to note that “*having regard to*” the objectives and policies of plans does not bind the Council in making its decision. Despite this, it is considered that there would need to be a good reason for going against the Council’s policy.

The proposed wastewater discharges to land should not compromise or result in a degradation of water quality, both surface and groundwater, and is therefore consistent with the objectives and policies in the Tasman Regional Policy Statement and the Tasman Resource Management Plan.

Provided the treatment and disposal system are operated and maintained, there should be no significant discharge of contaminants to air and therefore no significant adverse effects on neighbouring property owners should occur. The measures that will be required to be implemented as consent conditions should mitigate the odour effects.

In considering these applications, very few potential adverse effects have been identified or are considered likely to occur as a result of the wastewater discharges at the site. Consequently it is recommended that resource consents for the discharge of treated wastewater to land and the discharge of contaminants to air should be granted subject to conditions requiring the necessary mitigation measures to be undertaken.

The applicant has requested a 35 year term of consent for both the discharge of wastewater to land and contaminants to air. In considering the term of consent, the Council should take into account a variety such as:

- The sustainable nature of the resource affected by the proposal;

- The extent of knowledge of the environmental effects associated with the activity;
- The capital costs of the development and the anticipated “life” of any structure which is the subject of the application;
- The expiry date of other resource consents in the same catchment area where comprehensive reviews of all resource consents within that area are desirable; and
- The knowledge that the environmental effects of wastewater discharges are reasonably well known.

It is recommended that a term of consent of 15 years be granted for the discharge consents for the site. This term is considered appropriate to provide the applicant with security but also provides the Council the ability to fully scrutinise the consent in light of changes in technology and community aspirations in respect of wastewater discharges that may occur over this period.

It is my conclusion that, after considering the statutory provisions and those matters raised in the submissions, the applications made to the Council by Tasman Limited for the discharge permits should be approved subject to certain conditions as recommended in Section 15 of this report (below).

In addition, it is considered that, provided the recommended conditions on the consents are adhered to, there will be only minor adverse effects on the environment.

16. RECOMMENDED CONDITIONS OF CONSENT

NOTE: Two separate sets of conditions are provided, one for the discharge to land (RM060742) and one for the discharge to air (RM061007). The latter is presented at the end of this report.

Resource Consent RM060742 – Discharge of Treated Wastewater to Land

Resource consent number: RM060742

Pursuant to Section 104B of the Resource Management Act 1991 (“the Act”), the Tasman District Council (“the Council”) hereby grants resource consent to:

Tasman Limited

(hereinafter referred to as “the Consent Holder”)

Activity authorised by this consent: Discharge of treated domestic wastewater to land.

Location details:

Address of property:	Stringer Road, Stringer Valley
Legal description:	Lot 2 DP 320445, Lot 1 DP 342449, Pt Lot 2 DP 767 (Note: these are the legal descriptions of the property prior to subdivision)

Valuation numbers: 1938072100, 1938072108, 1938072108A,
1938072108B

Location of discharge: Various

Pursuant to Section 108 of the Act, this consent is issued subject to the following conditions:

CONDITIONS

Discharge Restrictions

1. The maximum rate of discharge shall not exceed 121,700 litres per day (121.7 cubic metres per day).
2. The discharge shall contain only treated wastewater which is of a domestic nature. For the purposes of this condition, wastewater which is of a "domestic nature" includes wastewater from toilets, urinals, kitchens, showers, washbasins, spa baths, and laundries but does not include water from spa pools and large-scale laundry activities. No industrial or tradewaste shall be included.

Advice Note:

Wastewater generated from tourist accommodation units and any associated food preparation areas is considered to be of a "domestic nature".

3. The treated wastewater entering the disposal areas, based on the results of any single sample collected from the sampling point required to be installed in accordance with Condition 28, shall comply at all times with the following limits:

Determinand	Maximum allowable concentration
Carbonaceous biochemical oxygen demand (cBOD ₅)	10 grams per cubic metre
Total suspended solids	10 grams per cubic metre
Faecal coliforms	100 coliforms units per 100 millilitres
Total nitrogen	25 grams per cubic metre

Disposal / Land Application System

4. The maximum loading rate at which the wastewater is applied to land shall not exceed 3.5 millimetres per day (3.5 litres per square metre per day).

Advice Note:

For a daily discharge volume of 121,700 litres the primary disposal area will need to be at least 3.49 hectares.

5. All wastewater shall be discharged to land by way of pressure compensating dripper line(s) laid parallel to the contours of the land. The Consent Holder shall, at all times, ensure that the dripper lines used for the disposal of wastewater are located within a planted area and have no less than a 50 millimetres cover of soil, bark or an appropriate alternative.
6. The pressure compensating drippers used to discharge the treated wastewater to land shall be spaced at intervals not exceeding 600 millimetres along the irrigation line and the maximum spacing between adjacent irrigation lines shall be 1 metre. The instantaneous flow rate for each dripper shall not exceed 1.6 litres per hour.
7. The primary and reserve wastewater disposal areas shall total at least 6.1 hectares and shall be located within the areas marked "Land Treatment Areas" as shown on the plan entitled "Forest Park – Mapua – Proposed Land Treatment Areas", being drawing number 8992-13E (dated July 2006) prepared by Glasson Potts Fowler (attached).

Advice Note:

This condition allows the Consent Holder the flexibility to utilise any of the areas identified as "Land Treatment Areas" on the plan referred to for the disposal of treated wastewater. However, as specified in the advice note to Condition 4 of this consent, a total of at least 3.49 hectares of land will need to be utilised when this consent is fully exercised (121,700 litres per day). The 2.61 hectares not used for the initial disposal of wastewater will be deemed to be the reserve area and the requirements of Condition 8 of this consent will apply to this land.

8. A suitable wastewater disposal reserve area equivalent to not less than 2.61 hectares shall be kept available for future use for wastewater disposal. This reserve area shall remain undeveloped and shall be located within the areas marked "Land Treatment Areas" on the plan referred to in Condition 7 of this consent. For the purposes of this condition "undeveloped" means that no permanent buildings or structures shall be constructed on the areas set aside as reserve areas, however the reserve areas may be planted with trees and other vegetation.
9. Notwithstanding Conditions 7 and 8, in the event that the total area required to adequately dispose of the wastewater is shown to be greater than 6.1 hectares, the Consent Holder shall make additional land available for such disposal.

Advice Note:

The Consent Holder has undertaken initial testing of the soils on the property and determined that a design irrigation rate (DIR) of 3.5 millimetres per day is appropriate for the soils present and has therefore put aside 6.1 hectares of land for primary disposal and reserve areas. However, there is a possibility that the DIR may need to be reduced should soil conditions be different to those found during the initial investigations. This Condition requires that additional land be set aside for land disposal in the event that the DIR in the design is found to be too high. The subject property is large and utilising additional land for land disposal of wastewater will not impose significantly on the Consent Holder's management of the property.

10. The disposal areas (including reserve areas) shall not be located on slopes averaging greater than 15 degrees over a 10 metres length and shall not be located within:
 - a) 20 metres of any surface water body;
 - b) 20 metres of any bore for domestic water supply;
 - c) 5 metres of any adjoining property or road; or
 - d) 600 millimetres, measured vertically, separation from dripper line to average winter groundwater table.

11. The disposal areas shall not be used for:
 - a) Roading, whether sealed or unsealed;
 - b) Hardstand areas;
 - c) Golf course tees and greens, and other intensively managed turf areas (e.g. grass tennis courts, bowling greens);
 - d) Erection of buildings or any non-wastewater systems structures; or
 - e) Stock grazing.

12. Any trees planted within the actual disposal area shall remain in place for the duration of this consent except for the purposes of removal and replacement of trees which have reached maturity or require removal for some other reason. In that situation the Consent Holder shall replace the removed trees with trees that are equally suitable, or trees that are of the same species, and will not remove and replace more than 20% of the trees in any one year.

13. The Consent Holder shall mark each wastewater disposal area by any means that ensures the extent of them is identifiable on the ground surface. Each disposal area shall be clearly labelled in at least two publicly accessible viewing places with visible warning signs which read "Wastewater Disposal Area – Avoid Contact" or equivalent. The details of such signage shall be submitted to Council's Coordinator Compliance Monitoring for approval prior to the exercise of this consent.

Advice Note:

The Consent Holder is advised to discuss the signage proposal for the wastewater disposal area with the local Medical Officer of Health before submitting them to Council for approval.

14. There shall be no surface ponding or surface runoff of any contaminants from any of the disposal areas as a result of the exercise of this consent.

Collection, Reticulation, Treatment and Disposal Systems

15. The Consent Holder shall submit a detailed "Wastewater Collection, Treatment, and Disposal Design Report", prepared by a person who is suitably experienced in designing wastewater treatment and disposal systems, to the Council's Coordinator Compliance Monitoring prior to the construction of the collection, treatment or disposal systems. This report shall provide evidence of how design requirements imposed by this Consent on the treatment and disposal systems shall be met and shall include, but not be limited to, the following information:

- a) certification that the selected disposal areas are of suitable topography and soil type and are suitable for the loading rates proposed and sufficiently stable for wastewater disposal;
 - b) the location and dimensions of disposal areas (including reserve areas), including setbacks from neighbouring properties, watercourses and domestic bores, depth of unsaturated soils beneath dripper lines and avoidance of slopes greater than 15 degrees;
 - c) details of how the disposal system will be operated and criteria to be used to determine the timing, period and rate of application. The criteria shall be based on, amongst other things, climatic data, soil moisture status, and groundwater levels within the disposal areas;
 - d) details regarding management of vegetation at the disposal area for the duration of consent;
 - e) the measures proposed to minimise stormwater infiltration and inflow into the disposal field;
 - f) the location of the wastewater treatment plant;
 - g) details of the treatment plant layout, including storage capacities of all tanks and layout of pumps (duty and standby); and
 - h) details of the wastewater collection system, including details of the grinder pumps and tanks to service the various buildings of the subdivision development.
16. The construction and installation of the wastewater collection system, treatment plant and disposal system shall be carried out in accordance with information submitted with the application for resource consent RM060742, the design report required to be prepared by Condition 15, and under the supervision of a person who is suitably qualified and experienced in wastewater treatment and disposal systems.
17. The person supervising the construction and installation of the wastewater collection system, treatment plant and disposal system shall provide a written certificate or producer statement to the Council's Coordinator Compliance Monitoring prior to the exercise of this resource consent. This certificate or statement shall include sufficient information to enable the Council to determine compliance with Conditions 4-8 (inclusive), 10, 11(a)-(d), and 13. In addition, the certificate or statement shall also confirm the following:
- i) that the wastewater system, including the collection system, treatment plant and the disposal areas, is capable of treating the design flows and that it has been designed generally in accordance with standard engineering practice;
 - ii) that all components of the wastewater system, including the collection system treatment plant and the disposal areas, have been inspected and

installed in accordance with the manufacturer's specifications and standard engineering practice; and

- iii) that the components used in the wastewater system, including the collection system treatment plant and the disposal areas, are in sound condition for continued use for the term of this resource consent, or are listed in the Operations and Management Plan (required by Condition 19) for periodic replacement.

18. Prior to the exercise of this consent, the Consent Holder shall submit a set of final "as-built" plans to the Council's Coordinator Compliance Monitoring which show the siting of all components of the wastewater collection, treatment, and disposal system. For the purpose of this condition, the Consent Holder shall ensure that the "as-built" plans are drawn to scale and provide sufficient detail for a Council officer to locate all structures identified on the plans.

Wastewater System Operation and Maintenance

19. A chartered professional engineer or suitably qualified person experienced in wastewater engineering shall prepare an "Operations and Management Plan" for the wastewater treatment and disposal system. This plan shall be prepared in accordance with the conditions of this resource consent and shall contain, but not be limited to, the following:
- a) an inspection programme to verify the correct functioning of the wastewater treatment and disposal systems including not less than monthly inspections of the wastewater treatment plant and disposal areas;
 - b) a schedule for the daily, weekly, monthly and annual operational requirements including requirements of compliance monitoring of consent conditions;
 - c) a schedule of maintenance requirements for the pumps, grinder pumps and tanks, recirculation tanks, treated effluent holding tank, flow meters and stormwater control drains;
 - d) a schedule of maintenance requirements for the management of vegetation on the wastewater disposal area;
 - e) a contingency plan specifying the actions to be taken in the event of failure of any component of the system and any non-compliance with the conditions of this resource consent;
 - f) details of how the wastewater disposal system will be managed;
 - g) emergency contact details (24 hour availability) for the Service Provider and Consent Holder; and
 - h) monitoring of the wastewater disposal areas shall include visual ground inspections to identify above ground and surface flows of wastewater and methods to remedy such flows should any be identified.

20. A copy of the "Operations and Management plan" required by Condition 19 shall be submitted to the Council's Coordinator Compliance Monitoring for approval prior to exercising this consent. Any changes to this plan shall be in accordance with the conditions of this consent and submitted to the Council's Coordinator Compliance Monitoring prior to them taking effect.
21. The Consent Holder shall enter into, and maintain in force, a written maintenance contract with an suitably qualified and experienced wastewater treatment plant operator suitably trained in wastewater treatment plant operation by the system designer, and approved by the Council's Coordinator Compliance Monitoring for the ongoing maintenance of the grinder pumps and tanks, and the treatment and disposal systems and control of the remote monitoring system as required by Condition 24. The maintenance contract shall require the operator to perform maintenance functions and duties specified in the "Operations and Management Plan" required to be prepared by Condition 19. A signed copy of this contract, including full contact details for the Service Provider, shall be forwarded to the Council's Coordinator Compliance Monitoring, prior to exercising this consent. Any changes to this maintenance contract must be in accordance with the conditions of this consent and submitted in writing to Council's Coordinator Compliance Monitoring prior to them taking effect.

In addition, the Consent Holder shall, every three months from the date of first exercising this consent, provide the Council's Coordinator Compliance Monitoring with a copy of a written report that details the maintenance that has been undertaken on the wastewater treatment and disposal system during the previous three month period in accordance with the requirements of the Operations and Management Plan.

Advice Note:

For compliance purposes, a suitably qualified and experienced person would be either a person employed and trained by the manufacturer of the treatment and disposal system, or someone who can provide evidence of satisfactory qualifications and experience in maintaining such wastewater treatment and disposal systems.

22. The collection and treatment tanks that form part of the wastewater treatment plant shall be inspected not less than once every three months and the grinder pumps and tanks shall be inspected not less than once every six months. Where appropriate, all tanks, except those which are specifically used for storing sludge, shall as a minimum be cleaned out once the combined depth of the sludge and scum in any tank occupies half of the tank's volume. Material collected from the desludging of tanks shall be removed from site for disposal at a facility authorised to receive such material.
23. The Consent Holder shall submit an "Asset Management Plan" for the wastewater collection, treatment and disposal system for approval by Council's Coordinator Compliance Monitoring prior to the exercise of this consent. This plan shall be prepared by a suitably experienced person and shall detail financial asset management requirements (including depreciation considerations) of the wastewater collection, reticulation, treatment and disposal systems for the duration of the consent. Any changes to this plan shall be in

accordance with the conditions of this consent and submitted to the Council's Coordinator Compliance Monitoring for approval prior to them taking effect.

Advice Note:

Section 11.2 of the Ministry for the Environment's Sustainable Wastewater Management, a handbook for smaller communities, would be a useful reference point in preparing this plan.

Contingency Measures

24. A telemetered 24 hour remote advance warning system shall be installed and operated that is capable of warning of any failure within the treatment or disposal systems (ie, pump failure or mechanical blockage).

This warning system shall be configured to be remotely monitored by the wastewater treatment plant operator for all systems and to activate an audible and visual alarm system located adjacent to the treatment plant or other prominent place on the site for the central treatment plant. The details of the alarm and monitoring systems shall be included in the "Operations and Management Plan" required by Condition 19 and shall achieve as a minimum the following:

- a) notify operators of any alarm;
- b) monitor and record daily flow readings from all meters;
- c) store and transmit daily reports to the operator of the discharge volume meter reading and system status from each site; and
- d) in the event of any alarm activating, the remote monitor and management system shall immediately notify the maintenance operator and shall continue notifying the operator until the condition has been remedied and cleared by the operator. An audible and visual alarm system shall be installed and operated on all grinder pumps and tanks and, as a minimum, this alarm shall be activated by a high level switch. The alarms associated with the grinder pumps are not required to be telemetered.

The Consent Holder shall maintain clearly visible signage adjacent to all external alarm panels at the plant to provide a 24 hour contact number in the event of an alarm being activated.

25. The Consent Holder shall ensure that the treatment plant is designed and maintained so that wastewater can be retained within the treatment system above the alarm level without overflow for a period of at least 12 hours, based on average dry weather flows and in accordance with the provisions in the "Operations and Management Plan". All pumps in the reticulation, treatment and disposal system that are essential for the continuous processing, treatment, and disposal of the wastewater shall include duty and standby units. The grinder pumps do not require a duty-standby set up and a single pump is only required.

Advice Note:

The second last sentence of this condition requires that all pumps in the reticulation, treatment and disposal system that are essential for the continuous operation of the treatment require duplication by way of having a duty and standby pump set up. However, this condition acknowledges that some of the pumps in the system, for example the waste sludge pump, are not necessarily essential for the ongoing operation of the treatment plant and will not be required to have a duty-standby set up.

26. The Consent Holder shall ensure that each grinder pump servicing the domestic dwellings of the subdivision has a sealed emergency storage volume of at least 1,000 litres. The grinder pumps servicing the semi-intensive residential villas, tourist accommodation units, and the commercial building shall have sealed emergency storage volumes equivalent to at least 12 hours average dry weather flow (based on full occupancy). For the purposes of this condition the "emergency storage" is defined as the normally empty volume that is available for temporary storage of wastewater during periods when there are power failures or unscheduled shutdowns of the pump station. The emergency storage volume may include the space within the pump station itself over and above the high level alarm and/or any separate external tank into which overflows from the pumping chamber may enter.

Advice Note for Conditions 25 and 26:

The site is relatively remote and the wastewater reticulation, treatment, and disposal system will be privately owned and as such the Council considers that emergency storage within the system should be designed conservatively. The Council has specified a 12 hour emergency storage volume at the treatment plant. The Consent Holder has designed the wastewater collection and treatment system on the basis that emergency storage will be provided both at the treatment plant and within the grinder pumps and tanks that will be located on each allotment. A minimum of 1,000 litres of emergency storage will be provided within each grinder pump tank and this equates to around 24 hours storage for each dwelling based on average dry weather flows. In addition, the Consent Holder will provide a minimum of 61,000 litres (61 cubic metres) of emergency storage at the treatment plant when the plant is at full capacity. However, the plant is proposed to be developed in a staged manner and as such the emergency storage provided over time will progressively increase up to the minimum of 61,000 litres. During periods of power outage, the grinder pumps will not operate so no wastewater will be pumped to the treatment plant during these periods. The Consent Holder has advised that during periods when there is a failure at the treatment plant but the grinder pumps remain operational, the system operator will arrange for the grinder pumps to be switched off. It is important that the Operations and Management Plan for the entire system outlines the procedures to be followed during these various scenarios.

27. Should power disruption result in the emergency storage capacity required to be provided at the treatment plant by Condition 25 and/or the emergency storage capacity required to be provided in the grinder pump tanks by Condition 26 being utilised to 80% capacity, the Consent Holder shall ensure that the wastewater is removed from the storage tank at that time for the purpose of maintaining capacity. Wastewater shall be disposed of to a facility that is

authorised to accept such wastes. The relevant details of how this will be achieved shall be incorporated in the "Operations and Management Plan" required to be prepared in accordance with Condition 19.

Monitoring and Reporting

28. A sampling point to allow collection of a sample of the treated wastewater, shall be provided at a point located directly after the final pump-out chamber and before the point where the wastewater discharges to the disposal field. Details of the location of this sampling point shall be forwarded to the Council's Coordinator Compliance Monitoring prior to the exercise of this consent.
29. A sample of the treated wastewater shall be collected from the sampling point required to be installed in accordance with Condition 28. Samples shall be analysed for five day carbonaceous biochemical oxygen demand (cBOD₅), total suspended solids, total faecal coliforms, total nitrogen, pH, and temperature. The frequency of sampling shall be as follows:
- a) for the first four months following treatment plant start up, samples shall be collected weekly when the plant is discharging to the disposal field for first two months and then two weekly for the two months following;
 - b) for the following eight months samples shall be collected monthly;
 - c) following the first 12 months samples shall be collected at least every two months (a total of at least six samples a year) provided compliance with the contaminant limits specified in Condition 3. Should these limits not be met, the sampling frequency required in b) above shall be re-established until compliance with the contaminant limits of Condition 3 has been achieved over an eight month period.
30. Prior to the exercise of this consent the Consent Holder, or its authorised agent, shall collect water samples on at least three different occasions from two locations in Stringer Creek, one being located upstream of the most western wastewater disposal area (at or about 2514020E 5991577N) and one being located approximately 100 metres downstream of the confluence of Stringer Creek and the unnamed tributary which flows in a northerly direction beside the proposed location of the treatment plant (at or about 2414700E 5991718N). The locations shall be fixed by Global Positioning System (GPS) and submitted to the Council's Coordinator Compliance Monitoring for approval prior to sampling. The sampling sites shall be clearly marked to enable future monitoring to be undertaken from the same locations. Following the exercise of this consent, the Consent Holder, or its authorised agent, shall collect water samples from the two sites in Stringer Creek described above every three months. These samples shall be analysed to determine the presence and concentration of the following determinands:
- Faecal coliforms
 - Total Kjeldahl Nitrogen
 - Total ammoniacal nitrogen
 - Dissolved inorganic nitrogen
 - Nitrate-nitrogen

- Nitrite-nitrogen
- Total phosphorous
- Dissolved reactive phosphorous

31. The discharge shall not cause contaminant concentrations at the downstream monitoring site identified by Condition 30 to exceed the following:

- Dissolved Inorganic Nitrogen <0.444 grams per cubic metre
- Total Nitrogen <0.614 grams per cubic metre
- Dissolved reactive phosphorus <0.01 grams per cubic metre
- Total phosphorus <0.033 grams per cubic metre

Advice Note:

These values are consistent with nutrient water quality guidelines (ANZECC 2000) for the protection of river ecosystem health.

32. All sampling referred to in this consent shall be carried out by a suitably qualified person approved by the Council's Coordinator Compliance Monitoring, using standard sampling methodologies and equipment and shall be transported to the laboratory under chain of custody. Where temperature, dissolved oxygen, and pH are required, these shall be measured in the field using standard methods and calibrated meters. The detection limits specified in Appendix 1 (Applicable Detection Limits, attached) shall apply to analyses that are undertaken by the laboratory. The samples shall be analysed using standard methodology by an IANZ accredited laboratory. The analytical results shall be forwarded to the Council's Coordinator Compliance Monitoring within 10 working days of the results being received from the laboratory.
33. The Consent Holder shall install and maintain at all times a calibrated flow meter, with an accuracy of $\pm 5\%$, on the outlet of the wastewater treatment system to measure the quantities of wastewater discharged to the wastewater disposal areas.
34. The flow meter required to be installed in accordance with Condition 33 shall be read manually or electronically at the same time daily. In addition, the Consent Holder shall also keep records of which disposal areas are utilised daily to dispose of the wastewater to enable daily irrigation rates to be calculated. Copies of these records shall be forwarded to the Council's Coordinator Compliance Monitoring quarterly in the Quarterly Monitoring Report required by Condition 39, within one month following the end of the three month period ending 31 March, 30 June, 30 September and 31 December each year.
35. Any exceedance of the authorised discharge volume (refer Condition 1) shall be reported to the Council's Coordinator Compliance Monitoring in writing within three days of the reading. This report must include any explanation for the non-compliance and an assessment of the likely effects of the functioning of the system and the receiving environment. These data shall be securely stored electronically for at least two years.

36. The Consent Holder shall log all complaints received relating to the exercise of this consent and shall maintain a register of complaints including the following information: date and time of the complaint; nature of the complaint; name, address and telephone number of the complainant if available; details of discharge at time of alleged problem; and any remedial action taken to rectify problem or mitigation proposed to prevent future complaints.
37. The Consent Holder shall report all complaints to the Council's Coordinator Compliance Monitoring in writing within 48 hours of receipt and the log, required to be kept in accordance with Condition 36 shall be made available to the Council upon request.
38. The Consent Holder or its authorised agent shall notify Council's Coordinator Compliance Monitoring of any wastewater discharge to land or water from the treatment plant or wastewater reticulation system which is not authorised by this consent in writing as soon as practicable (but no more than 24 hours) after the discharge commenced.
39. The Consent Holder shall prepare and present a Quarterly Monitoring Report every three months for the duration of the consent to the Council's Coordinator Compliance Monitoring, reviewing the performance of the treatment and disposal system and shall include the following:
 - a) actual monitoring results for monitoring undertaken in accordance with Conditions 29 and 30 above, for the past quarter and compliance with discharge and receiving environment limits specified in Condition 3 and Condition 31 respectively;
 - b) an interpretation of monitoring results and an outline of any trends in changes in discharge volume, wastewater discharge quality and quality of the receiving waters. It shall also identify any actual and potential effects on the receiving environment identified since the previous report to the Council; and
 - c) a summary of any difficulties that have arisen with the plant operation and/or public complaints received and any remedial actions taken as a result during the previous period.

General Conditions

40. The wastewater treatment system shall be located, and the surrounding area maintained, so that vehicular access for maintenance is readily available at all times.
41. The Council may, in the period 1 May to 1 September each year, review any or all of the conditions of the consent pursuant to Section 128 of the Resource Management Act 1991 for all or any of the following purposes:
 - i) to deal with any adverse effect on the environment which may arise from the exercise of the consent that was not foreseen at the time of granting of the consent, and which is therefore more appropriate to deal with at a later stage; and/or

- ii) to require the Consent Holder to adopt the best practical option to remove or reduce any adverse effects on the environment resulting from the discharge; and/or
 - iii) reviewing the contaminant limits, loading rates and/or discharge volumes and flow rates of this consent if it is appropriate to do so; and/or
 - iv) reviewing the frequency of sampling, flow monitoring and/or number of determinands analysed if the results indicate that this is required and/or appropriate.
42. The Consent Holder shall administer the responsibilities and obligations of all persons who own lots connected to the wastewater treatment and disposal system, to comply with the conditions of this consent. The Consent Holder shall ultimately hold responsibility for ensuring that the owners of properties within the development:
- i) are connected and discharge to the reticulation and central treatment system whenever the respective dwellings first become occupied; and
 - ii) are aware of and comply with the rules associated with the connection, including restrictions on the discharge of toxic substances.

Lapsing of Consent (RMA Section 125) and Duration of Consent (RMA Section 123)

43. The consent will lapse 10 years after the commencement of the consent.
44. This consent expires on 1 May 2022.

ADVICE NOTES

1. This resource consent only authorises the activity described above. Any matters or activities not referred to in this consent or covered by the conditions must either: 1) comply with all the criteria of a relevant permitted activity rule in the Proposed Tasman Resource Management Plan (PTRMP); 2) be allowed by the Resource Management Act; or 3) be authorised by a separate resource consent.
2. The Consent Holder shall meet the requirements of Council with regard to all Building and Health Bylaws, Regulations and Acts.
3. All reporting required by Council shall be made in the first instance to the Council's Coordinator Compliance Monitoring.
4. The Consent Holder is advised that compliance with operating guidelines provided by the wastewater system manufacturer and system designer is recommended to reduce the likelihood of malfunction of the treatment or disposal system and a possible breach of consent conditions.

5. The Consent Holder is recommended to prohibit the installation of garbage grinders to all dwellings within the development as it is well recognised that such fixtures are likely to affect the level of contaminants in the wastewater and create problems in complying with the wastewater quality limits imposed by this consent.
6. If the site becomes part of an urban drainage area identified by Council when future reticulation is available, the Consent Holder will be required to provide connection from the dwellings or treatment system to the sewer line.
7. Council draws your attention to the provisions of the Historic Places Act 1993 that require you in the event of discovering an archaeological find (eg, shell, midden, hangi or ovens, garden soils, pit, depressions, occupation evidence, burials, taonga) to cease works immediately, and tangata whenua, the Tasman District Council and the New Zealand Historic Places Trust shall be notified within 24 hours. Works may recommence with the written approval of the Council's Environment & Planning Manager, and the New Zealand Historic Places Trust.
8. It is strongly recommended that household water reduction fixtures be included in the design of the dwellings and other buildings of the development in order to ensure that the discharge volume limit is met. The measures and fixtures should be in accordance with AS/NZS 1547:2000 and Auckland Regional Council's Technical Publication 58.

Rob Lieffering
Co-ordinator Resource Consents

APPLICABLE DETECTION LIMITS

Parameter	Detection Limits	Units
Carbonaceous biochemical oxygen demand	¹ 2	g/m ³
Total Suspended Solids	3	g/m ³
Total faecal coliforms	10	MPN or cfu/100 mL
Total Kjeldahl Nitrogen	0.02	gN/m ³
Total ammoniacal-N	0.1	gN/m ³
Nitrate-nitrogen	0.01	gN/m ³
Nitrite-nitrogen	0.01	gN/m ³
Total Phosphorus	0.01	gP/m ³
Dissolved Reactive Phosphorus	0.01	gP/m ³

Notes:

1. These detection limits apply unless other limits are approved in writing by the Manager.

Resource Consent RM061007 – Discharge of Contaminants to Air

Resource consent number: RM061007

Pursuant to Section 104B of the Resource Management Act 1991 (“the Act”), the Tasman District Council (“the Council”) hereby grants resource consent to:

Tasman Limited

(hereinafter referred to as “the Consent Holder”)

Activity authorised by this consent: Discharge of contaminants, primarily odorous compounds, to air from the operation of a wastewater collection, wastewater treatment plant, and wastewater disposal areas.

Location details:

Address of property: Stringer Road, Stringer Valley
Legal description: Lot 2 DP 320445, Lot 1 DP 342449, Pt Lot 2 DP 767
(Note: these are the legal descriptions of the property prior to subdivision)
Valuation numbers: 1938072100, 1938072108, 1938072108A, 1938072108B
Location of discharge: Various

Pursuant to Section 108 of the Act, this consent is issued subject to the following conditions:

CONDITIONS

1. The Consent Holder’s operations shall not give rise to any discharge of contaminants to air, which in the opinion of an Enforcement Officer of the Council is noxious, dangerous, offensive or objectionable at or beyond the property boundary.

Advice Note: To comply with this condition, the Consent Holder may need to install and maintain odour filtration devices on outlets and/or vents of tanks which have the potential to generate odours.

2. The Consent Holder shall log all complaints received relating to the exercise of this consent and shall maintain a register of complaints including the following information: date and time of the complaint; nature of the complaint; name, address and telephone number of the complainant if available; details of discharge at time of alleged problem; and any remedial action taken to rectify problem or mitigation proposed to prevent future complaints.
3. The Consent Holder shall report all complaints to the Council’s Coordinator Compliance Monitoring in writing within 48 hours of receipt and the log, required to be kept in accordance with Condition 2 shall be made available to the Council upon request.
4. The Council may, in the period 1 May to 1 September each year, review any or all of the conditions of the consent pursuant to Section 128 of the Resource Management Act 1991 for all or any of the following purposes:

- i) to deal with any adverse effect on the environment which may arise from the exercise of the consent that was not foreseen at the time of granting of the consent, and which is therefore more appropriate to deal with at a later stage; and/or
 - ii) to require the Consent Holder to adopt the best practical option to remove or reduce any adverse effects on the environment resulting from the discharge; and/or
5. The consent will lapse 10 years after the commencement of the consent.
6. This consent expires on 1 May 2022.

Advice Note:

1. This resource consent only authorises the activity described above. Any matters or activities not referred to in this consent or covered by the conditions must either: 1) comply with all the criteria of a relevant permitted activity rule in the Proposed Tasman Resource Management Plan (PTRMP); 2) be allowed by the Resource Management Act; or 3) be authorised by a separate resource consent.