Application for Resource Consent by Carterton District Council to discharge treated domestic sewage to water from the Carterton District oxidation ponds

1. The Activity

Carterton District Council (CDC) have applied for resource consent to continue to discharge (secondary) treated domestic sewage from the Carterton District oxidation ponds, at a maximum rate of 3,270 cubic metres per day, to the Mangatarere Stream, at or about map reference NZMS 260 S26 201 154.

2. Background

The proposal is for a continuation of the existing discharge, with a staged programme of upgrading the discharge and investigating and implementing alternative discharge options.

Sewage from Carterton township is gravity fed to the treatment plant on Dalefield Road. The incoming sewage is screened to remove debris and floatables and then pumped to a clarifier where sludge is drawn off to the digester and the liquor is discharged to oxidation ponds (Ponds 1 & 3). Solids from the treatment process are dried and buried in the adjacent town landfill.

The oxidation ponds are shallow fully mixed lagoons and provide an aerobic treatment system. Oxidation ponds 1 and 3 are in parallel and treated effluent from both ponds is discharged to the final pond in the sequence (Pond 2) for further treatment before being discharged to the Mangatarere Stream via 200 metres of open drain.

3. Wastewater Volumes and Composition

The volume of treated effluent discharged depends on inflows (which are dependent on water use, stormwater infiltration and groundwater levels) and rainfall. Estimated daily effluent discharge volumes range from 780 m^3/d in the summer to 3270 m^3/d in winter. In very heavy rainfall, the ponds provide some buffering but there may be occasions when the estimated maximum discharge rate is exceeded.

The 1994-1997 WRC/CDC effluent monitoring data (Table A6.2 of the applicant's Assessment of Environmental Effects) provides some indication of the average final effluent quality discharged from the Carterton oxidation ponds in recent years, -

pH	7.5
Suspended solids	55.3 g/m^3

BOD_5	26.1 g/m^3
Dissolved oxygen	7.8 g/m^3
Ammonium-N (NH_3 – N)	8.1 g/m^3
Nitrate-N	1.1 g/m^3
Dissolved reactive phosphorus (DRP)	3.7 g/m^3
Total Phosphorus	4.8 g/m^3
Faecal coliforms	1880 per 100 mL (geometric mean)

This indicates a 26 BOD_5 : 55 SS ratio which is efficient for a treatment plant of this type as is the bacteria level of 1880 Fc per 100 mL (geometric mean).

4. Submissions

The applications were publicly notified on Saturday 29 November 1997 in the Wairarapa Times Age and persons considered by the Wellington Regional Council to be directly affected were individually notified and a sign placed at the site. A total of five parties made submissions when the time for submissions closed on 22 January 1998.

The submissions are summarised as follows:

- **Department of Conservation**

  Reason for making submission:

  Conditional support for application but concerned about conflict with s107(1) RMA and Regional Plans. Supports upgrade (with timetable) of the plant, monitoring of receiving waters, and discharging to land during summer.

  Seeks the following:

  That the term of the consent be limited to 7 years.

- **Ngati Kahungunu ki Wairarapa**

  Reason for making submission:

  Concerned about effects on receiving water and aquatic life, but notes that Maori people generally do not gather watercress or trout from the area. Discharge to land preferred. Strongly opposes discharge of body parts/fluids.

  Seeks the following:

  No specific decision has been requested but would prefer the sewage to be discharged to land if feasible. Conditions should address environmental effects.

- **Rangitaane o Wairarapa Inc**

Reason for making submission:

Fundamentally opposed to any discharges of treated sewage into waterways within their tribal rohe. Concerned about adverse effects on receiving water (colour change, and increased suspended solids, nutrients, and bacteria levels), discharge of medical waste, conflicts with the Regional Policy Statement and Plans, and insufficient investigation of wastewater disposal alternatives.

Seeks the following:

Decline the application. If consent is granted then its conditions should require frequent monitoring of effluent and receiving water, evaluation of land based treatment systems, ensure aquatic life is protected, and that the term of consent be three years. Rangitaane o Wairarapa wish to be part of any process to select the final sewage treatment method.

- **W H & P M Tucker**

Reason for making submission:

Conditional support for application. Although winter discharge is acceptable, discharge to land during summer is strongly preferred. Managing the Mangatarere Stream for bathing during the summer is preferred. Have asked to be informed of any deterioration of water quality in the Mangatarere.

Seeks the following:

No specific decision but support consent conditions that relate to monitoring the impacts of the discharge, implementing a treatment plant operational and management plan, ongoing improvements, receiving water standards and review conditions.

- **Wellington Fish and Game Council**

Reason for making submissions:

Opposed to the granting of resource consent. Concerned about potential adverse effects on trout, trout habitat, and angling opportunity within the Mangatarere Stream. Says current operation of the sewage plant results in undesirable environmental conditions in the receiving water of the Mangatarere Stream.

Seeks the following:

Term of consent to be five years with an upgrading of the discharge so that environmental outcomes of the Proposed Regional Freshwater Plan can be met.

5. Pre-hearing Meetings

Pre-hearing meetings were held on 7 April 1998 and 29 July 1998 and were attended by representatives of the applicant and some of the submitters. Outcomes arising from the discussions were:

- Iwi stressed their view that discharge of sewage to water is culturally unacceptable, and that their long term objective is that the sewage is discharged to land all year round. A short term consent is preferred.

- CDC said that winter discharge to land is not currently feasible because of potential problems with high rainfalls, high water tables and the high volumes of sewage. However, CDC underscored its commitment to discharge sewage to land during the "summer" by the summer of 2002/3 and maintained that the receiving water criteria of Mangatarere Stream could be easily met during winter.

- Agreement was reached in principle on the proposed timeframes for plant upgrade, investigation and implementation of a land disposal option.

- Iwi are concerned at the discharge of human body parts and fluids to water. No body parts are discharged to sewers in Carterton but body fluids are, e.g., from the embalmers and medical centres. The District Council was asked to seek disposal alternatives for these waste types.

- The option of discharge to water via land (wetland or rock filter) was explored. However, iwi did not regard discharge to the stream via wetland or rock filter as being a "discharge to land". Both iwi and the applicant concluded the wetland or rock filter would be of little value because it provided no additional treatment beyond effluent polishing.

- The issue of consent term was not resolved.

Reports of the pre-hearing meetings are held on file in the Planning and Resources Department, WRC and, if required, are available for inspection by the Committee.

Wellington Regional Council's draft conditions considered at the pre-hearing meetings were subsequently amended. The amended draft conditions, as set out in this report, have now been agreed to by the applicant, Wellington Regional Council officers and all submitters and are considered appropriate should the consents be granted. All submitters have withdrawn their requests to be heard at a formal hearing.

6. Statutory Reasons for Consent Requirement

The application seeks consent to discharge treated sewage to Mangatarere Stream. This activity is not expressly allowed by a rule in a regional plan; the application needs consent under section 15(1)(a) RMA.

There are no relevant rules in the Transitional Regional Plan that address the proposed discharge of contaminants as treated municipal sewage to water. Therefore the activity is an **innominate** activity under the Transitional Regional Plan.

Under the Proposed Regional Freshwater Plan for the Wellington Region (PRFP), the proposed discharge to water is covered by Rule 5, *All Remaining Discharges to Fresh Water* and has status as a **discretionary** activity.

7. Matters to be Considered

7.1 The Resource Management Act 1991

Relevant sections of the RMA include:

- *effect* as defined in section 3.
- Part II, Purpose and Principles.
- Section 104 (1) and section 104 (3), section 107.

7.2 Planning Instruments to Consider

- The Regional Policy Statement for the Wellington Region (RPS)
- The Transitional Regional Plan (TRP)
- Proposed Regional Freshwater Plan (PRFP)

8. Discussion of Matters to be Considered

The issues that have been raised by the submitters and concerns of Planning & Resources Department, Wellington Regional Council, are summarised and discussed.

8.1 Assessment of Discharge Permit Application WAR 950148 : Discharges of Treated Wastewater to Mangatarere Stream.

Section 104(3) RMA requires you when considering an application for a discharge permit to have regard to:

(a) *The nature of the discharge and the sensitivity of the proposed receiving environment to adverse effects and the applicants reasons for making the proposed choice; and*

(b) *Any possible alternative methods of discharge, including discharge into any other receiving environment.*

In respect of section 104(3)(a) RMA, the nature of these discharges is secondary treated municipal wastewater. Discharges from the Carterton District oxidation ponds in significant quantities or at low quality could have adverse effects on Mangatarere Stream and other downstream receiving environments. I consider this issue further in relation to the provisions in the various RMA instruments.

In respect of CDC's *reasons for making the proposed choice*, there may, in practice, be other long term disposal options for treated effluent from the Carterton oxidation ponds (e.g., land disposal).

Effects of Discharges of Treated Wastewater to Mangaterere Stream.

Beneficial

The proposed long term disposal of treated effluent to Mangaterere Stream is a low cost option for an essential activity necessary to meet the public health needs of the Carterton community. In addition a maturation pond, as proposed by the applicant, would provide for polishing of the effluent before its disposal. That polishing may result in improvements over the current system and also assist the plant to meet the waterway classification. In those respects the proposal would have considerable beneficial effects on the environment.

Adverse

Effects on Water Quality

Mangatarere Stream and Waiohine River are the main receiving waters for the treated effluent from the Carterton oxidation ponds.

The water quality of the Mangatarere Stream is required by the PRFP to be managed for fishery and fish spawning purposes, and the whole stream is used by anglers. However, the Mangatarere is also used for swimming although the most popular spots are currently above the effluent discharge (Mangatarere Valley Road upwards). The water quality in the Mangatarere Stream is also influenced by runoff from an agricultural catchment, and may exceed guidelines upstream of the discharge on occasions.

The applicant's analysis of the available flow data shows that the critical low flow months are between January and April, and flows at the discharge point may be less than 500 litres per second, with the lowest flows of 370 litres per second likely to occur in March and April. The estimated effluent discharge in autumn is 14 litres per second.

The Mangatarere Stream discharges into the Waiohine River about 2 km downstream of the sewage drain. Under the PRFP, the Waiohine River is required to be managed for fishery and fish spawning purposes and also for contact recreation purposes. The confluence of Mangatarere Stream with the Waiohine River is popular for anglers and swimmers alike prior to low summer flows.

Using the results of environmental monitoring undertaken upstream and downstream of the discharge since 1994, the applicant's Assessment of Effects indicates that :

- The discharge has negligible impacts on conductivity, dissolved oxygen levels, and pH of the receiving environment.

- Nitrate and ammonia levels are elevated downstream but remain within guidelines for stockwatering and fish protection respectively.

- The oxidation pond discharge is having a significant effect on the suspended solids, turbidity, colour and clarity, faecal coliform content, and nuisance periphyton growth (through elevated DRP, TN and DIN levels) in the Mangatarere Stream, particularly during the summer months when pond performance can be compromised and flows in the river are at a minimum.

Macroinvertebrate Community Index studies on the Mangatarere Stream, indicate that its general water quality is quite variable throughout the year. However, during the peak summer period the oxidation pond discharge appears to have a significant effect on the taxonomic composition of the freshwater ecosystem.

The WRC municipal oxidation pond monitoring program for the Wairarapa region generally confirms the above impacts on the water quality of Mangatarere Stream.

CDC has examined long term improvements to the sewage treatment system and alternative methods of discharge. One outcome of the pre-hearing process was that CDC confirmed its commitment to discharge treated sewage to land during the *summer* by the summer of 2002/3. An alternative of setting minimum flow levels above which the permit holder could discharge to the stream has obvious merit. However, in the absence of any auto recording system on the Mangatarere, any condition linking minimum flow levels is currently impractical. Therefore conditions 11 and 12 have been cast in which "summer" is defined as 1 January to 31 March inclusive and may be reviewed (at the appropriate time) and substituted in part or whole by a minimum flow type threshold condition.

"Summer" as defined in condition 11 is based on actual and inferred flows recalculated from 103 gauging (1967 - 1997) for a site just upstream of the discharge (at Dalefield Road). A flow of 500 L/s (whereby the effluent contributes 2-4% of that flow) was used to set the crucial months where discharge to the stream is undesirable. Note that the monthly % of gauging > 500L/s were: November 95%, December 58%, January 24%, February 15%, March 5%, April 25%, and May 100% (April - May had insufficient gauging to provide useful confidence limits). I note that consents are permissive documents and that CDC as a public body with an obligation to provide for the public good need not choose to exercise the consent during December (or during any winter month) should it decide that flows are too low at any one time.

Condition 19 has been set to reflect the minimum water quality standards established in section 70 and 107 RMA and also the water quality guidelines in Appendix 8 of the PRFP for water to be managed for aquatic ecosystem purposes.

In condition 19 *reasonable mixing* is explicitly defined as *to have occurred within 40 metres of the effluent discharge point to Mangatarere Stream.* I consider the 40 metre non-compliance zone is not unreasonable because it does not frustrate the objectives of the PRFP for Mangatarere Stream.

Because the effluent discharges from a drain just before a bend in the Mangatarere Stream, mixing with the receiving waters is insubstantial while the yellow-green discharge plume hugs the outside of the active channel. Once around the stream bend (and within 40 metres of the sewage outlet) gravel riffles effect rapid and complete mixing. Given the allowance for reasonable mixing under section 107 RMA, this oxidation pond effluent at most times would not be able to meet at least the colour and visual clarity requirements of condition 19 within 40 metres of the outfall.

The applicant considered the discharge might not be able to comply with a 40 metre *non-compliance zone* until 2003. In not defining *reasonable mixing* until that time, the expectation of WRC and submitters is that CDC as a public body will not, in that interim, cause the effects listed under condition 19 to occur beyond that which is *reasonable*.

Effects of Pathogens in the Discharge

Sewage discharges of this type are likely to contain large numbers of human enteric pathogens. However, the Assessment of Effects has no account of any testing of the effluent for viruses and bacterial pathogens and therefore the **public health risk** posed to users of the receiving waters is unknown. I note that the health risk from waterborne pathogens in the discharge may not reflect the expected risk based on faecal coliform concentrations. Waterborne pathogens may survive in the receiving environment much longer than the bacterial indicators. What can be said though is that high faecal coliform levels (e.g., those up to 500,000 Fc /100 mL that persisted during the 1995 and 1996 summers) indicate unacceptable levels of pathogens in the discharge, whereas relatively low faecal coliforms (e.g., the effluent geometric mean of 1880 Fc / 100 mL) do not necessarily imply that the discharge is safe.

The main contaminants discharged to Mangatarere Stream that are of concern in terms of human health are pathogenic micro-organisms, in particular, viruses, some bacteria and some protozoans such as *Giardia* and *Cryptosporidium*. Such organisms can cause a variety of health problems including ear, nose, throat and skin infections, and stomach ailments, and are potentially fatal to persons with poor immune systems.

Furthermore, pathogen micro-organisms that survive into the wider environment downstream to Waiohine River would also present some risk to users of those waters although dilution would reduce that risk.

For public health reasons then the aim should be that the sewage discharge not cause the water quality in the Mangatarere Stream to exceed bacterial standards for contact recreation after *reasonable mixing*. Whereas condition 16 addresses monthly monitoring of receiving waters, given the many other upstream discharges (point source or otherwise), unless the plant were discharging high levels of contaminants (e.g., faecal coliforms to 500,000 /100ml) it would be, on the balance of probabilities, difficult to demonstrate that the sewage discharge was causing the degraded state of the receiving water downstream.

Through section 108(1)(e) RMA, Parliament has purposely contemplated the BPO condition for discharge permits. Therefore conditions 22 and 23 are set as “end of pipe”

standards that in my opinion have the effect of being the best practicable option of either preventing or at worst minimising the actual or likely effects of the discharge of contaminants on the receiving environment. In reaching this conclusion I have first considered section 108(8) RMA and, as above, had regard to *the nature of the discharge and the receiving environment,* and *other alternatives including any condition requiring the observance of minimum standards of quality of the receiving environment.*

This discharge needs to be suitably controlled at its source (outlet of the final oxidation pond) which is where CDC looses control of the effluent quality – farm run-off is channelled into the effluent drain before the Mangatarere Stream. In my view practical effect is given to the requirements of section 108(1)(e) RMA by ensuring the contaminants discharged are at levels which, having taken into account dilution due to reasonable mixing, are levels which on best scientific and technical information available constitute the best practicable option of minimising adverse effects on the environment.

Furthermore conditions 22 and 23 provide CDC, WRC, and submitters with certainty and moreover are enforceable. Compliance targets only three parameters whose exceedance levels/criteria are reasonable and fair, e.g., for the current discharge as described, a geometric mean of 5,000 Fc per 100 millilitres at maximum discharge rate of 3,270m^3/day into minimum river flow of 500L/s and diluted for complete mixing should enable recognised standards (as median values) in receiving waters for secondary contact to be met.

Are the prescribed bacteria standards achievable? Recalculation of the applicant's effluent quality data (Tables A6.1 and A6.2 of AEE) indicates the levels set under conditions 22 and 23 are currently achievable although that recalculation did not include the particular faecal levels up to 500,000 /100ml for the 1995 and 1996 summers – these data reflect unacceptable levels of pathogens in the discharge and should not be part of a basis for the calculation of a reasonable effluent standard. I also note that that effluent quality data do not reflect the effluent quality that could be achieved when mechanical aerators are installed (i.e., by 31 June 1999 as required by condition 13).

Effects on Maori Cultural and Spiritual Values

Rangitaane o Wairarapa Inc and Ngati Kahungunu ki Wairarapa presented detailed submissions and participated fully in the resource consent process. I met with Ms Burge and Mr Hemi of those iwi on 17 February 1999 and I underscore their fundamental view point that disposal of human sewage, treated or otherwise and including medical waste in any form, to the Mangatarere Stream is culturally and spiritually offensive to Maori. Long term discharge to land is their desired option.

The Requirements of Section 107 of the Act

If the discharge is undertaken in compliance with the recommended conditions, its continuance should not give rise to any of the effects described in section 107 of the Act.

8.2 **Planning Instruments and Statutory Purpose**

The proposal caters for an essential community need and generally promotes sustainable management although to some extent is inconsistent with sections 6(e), 7(a) and 8 of the Act. The proposal generally complies with the policies in the Regional Policy Statement and Proposed Regional Freshwater Plan.

9. Decisions on Applications

Section 105 (1) (b) of the Act provides that, after considering an application for a resource consent, a consent authority may grant or refuse its consent and may, in accordance with section 108 include any conditions in the consent.

A consent authority shall not grant a resource consent which is contrary to section 107.

10. Duration of Consents and Conditions

The duration of a consent is covered by section 123 of the Act. The applicant has requested a term of 20 years for the consent, but has agreed with submitters and WRC for the consent to expire 10 years after its commencement.

Conditions on resource consents should be fair and reasonable, and relate to the subject matter of the consent. They should have purpose and certainty and should be achievable and measurable. The conditions, as set out in this report, have been agreed to by the CDC, Wellington Regional Council officers and all submitters.