greater WELLINGTON
REGIONAL COUNCIL

Report to the Hearing Committee on a notified resource consent application

Summary of application

Activity: To upgrade and continue operating the Masterton wastewater treatment plant

File Reference: WAR 090066

Applicant: Masterton District Council
P O Box 444
Masterton

Recommendation: I recommend that **discharge permits [27160, 27161, 27162, 27163, 27164, 27165, 27170, 27171]** be **granted,** subject to consent conditions, for the reasons outlined in this report.

I recommend that **water permits [227166, 27167, 27172]** be **granted,** subject to consent conditions, for the reasons outlined in this report.

I recommend that **land use consents [27168, 27169]** be **granted,** subject to consent conditions for the reasons outlined in this report.

Report prepared by:	Stephanie Brown	Opus International Consultants		11/02/09
Report approved by:	Alistair Cross	Manager, Environmental Regulation		11/02/09

Contents

1. Purpose

To make a recommendation to the Joint Hearing Panel on an application made by Masterton District Council under the Resource Management Act 1991 (the Act) for the resource consents required to upgrade and continue operating the Masterton Wastewater Treatment Plant (MWWTP or the plant).

2. Application

2.1 Applicant

Masterton District Council
PO Box 444
Masterton

Attn: Wes Ten Hove

2.2 Consents applied for

Ongoing consents:

WAR 090066 (27160) - Discharge permit to discharge treated wastewater (effluent) to the Ruamahanga River.

WAR 090066 (27161) - Discharge permit to discharge stormwater runoff from the wastewater irrigation land to the Ruamahanga River and Makoura Stream.

WAR 090066 (27162) - Discharge permit to discharge treated wastewater (effluent) to land via an irrigation system.

WAR 090066 (27163) - Discharge permit to discharge partially treated wastewater (effluent) to land and groundwater through the base of the existing oxidation ponds and new oxidation ponds.

WAR 090066 (27164) - Discharge permit to discharge wastewater sludge and residual liquid to land from the sludge dewatering process and sludge landfill.

WAR 090066 (27165) - Discharge permit to discharge odours and aerosols to air from the oxidation ponds, land irrigation system, and sludge dewatering process and landfill, and other activities from the site.

WAR 090066 (27166) - Water permit to divert surface water in the Ruamahanga River during flood events by upgrading existing stopbanks.

WAR 090066 (27167) - Water permit to permanently divert the Makoura Stream around the new oxidation ponds.

WAR 090066 (27168) - Land use consent to construct, place, use, and maintain a structure (diffuser outfall) in the bed of the Ruamahanga River.

WAR 090066 (27169) - Land use consent to disturb the bed of the Ruamahanga River arising from construction and maintenance of the diffuser outfall and erosion protection works adjacent to the existing oxidation ponds.

One-off construction related consents:

WAR 090066 (27170) - Discharge permit to discharge sediment-laden stormwater to the Ruamahanga River and Makoura Stream arising from bulk earthworks.

WAR 090066 (27171) - Discharge permit to discharge any treated wastewater and groundwater to water arising from dewatering processes at various locations.

WAR 090066 (27172) - Water permit to divert and take groundwater arising from dewatering processes from cut-off and drainage trenches during construction activities.

The consents are sought for a period of 35 years.

2.3 Location

The proposed activity will take place at the Masterton wastewater treatment plant and adjoining Council owned land at Homebush, approximately 5 km south-east of Masterton, and the Ruamahanga River/Makoura Stream and land adjacent to these watercourses. The activities lie approximately within the following map references - NZMS 260: T26 2735346-6021812, T26 2736386-6020372, T26 2735477-6019847, T26 2734923-6020722 (further details are provided in the applications and supporting documents).

3. Background

The MWWTP in its current form has been in place since the early 1970's. The network leading to the MWWTP consists of 127 km of piped reticulation within the Masterton urban area and various other infrastructure.

Following the delay in processing replacement applications lodged in the mid-1990's for the continued operation of the plant, interim resource consents were issued in 2003 to the applicant for an interim upgrade and continued operation of the plant. Whilst a 10 year consent term was sought by the applicant, the Hearing Committee granted resource consents for a 7 year term. The existing consents (WAR 020074) therefore expire on 20 January 2010.

Key aspects of the interim resource consents as set by consent conditions are:

- Immediate interim upgrade including installation of brush aerators, pond mixing improvements, outlet screen, construction of bund and rock filter, installation of new maturation cell within the secondary pond.

- Timeframes for investigation, deciding, and implementing a long term upgrade by 2010.

- Consultation process for general public and key stakeholders.
- Monitoring of the wastewater discharge.
- Setting of discharge standards.

Replacement resource consent applications for the existing consents were originally lodged with Greater Wellington in May 2007. Included with the resource consent applications was a notice of requirement lodged with Masterton District Council to alter and extend an existing designation for the MWWTP site. Both applications were accompanied by an 'Assessment of Environmental Effects' (AEE) report.

The applications made to Greater Wellington and Masterton District Council by the applicant were publicly notified separately in June 2007 and July 2007. 12 submissions were received on the notice of requirement whilst 69 submissions were received on the resource consent applications.

A pre-hearing meeting was held in November 2007 to discuss issues raised in submissions. Further information on the details and outcomes of this pre-hearing meeting are discussed in section 7 of this report.

In December 2007, the applicant decided to make a significant alteration to their proposed upgrade by decommissioning the existing oxidation ponds and constructing new oxidation ponds. Greater Wellington advised the applicant that fresh resource consent applications would need to be lodged and publicly notified. A new set of resource consent applications and notice of requirements was lodged by the applicant to Greater Wellington and Masterton District Council on 20 August 2008.

4. Existing and proposed description of activities

4.1 Existing environment

The site of the MWWTP is located close to the urban area of Masterton. It is surrounded by pastoral farmland including many small lifestyle blocks.

The Ruamahanga River (which is the main river traversing the Wairarapa valley floor to Palliser Bay) bounds the eastern and southern borders of the site, whilst the Makoura Stream flow in a north to south direction through the middle of the site.

On the site itself, there is a stand of native bush (mainly remnant kahikatea) with occasional other native trees scattered across parts of the site. To the south-west corner of the site, a splinter of the Carterton fault is likely to exist, however the most active fault (Masterton fault) is approximately 6-7 km away from the site.

The soils on the site have been formed from the floodplain of the Ruamahanga River and therefore consist of gravel sediments mixed with sandy and silty alluvium material.

In terms of climatic conditions, the average rainfall for Masterton is 916 mm/year, whilst the wind rose for the closed climate site at East Taratahi shows that the predominant wind direction is from the north-east.

4.2 Existing plant and processes

Wastewater from the reticulation network within Masterton passes through an electromagnetic flowmeter before entering an open channel in which a grit collection sump is located prior to a step screen. Screenings are collected and disposed of at the existing town landfill.

Following screening the wastewater flow is split in half and directed to two primary ponds (ponds 1 and 2) which then feed into the secondary pond (pond 3). Within the secondary pond is recently constructed bund and rock filter which wastewater passes through prior to entering a maturation cell. In total four brush aerators are located in the primary ponds and one other aerator is located in the secondary pond to assist wastewater flow movement within the pond system.

Wastewater is discharged from the maturation cell to the Makoura Stream via a weir (which contains a flow monitoring device).

4.3 Existing wastewater characteristics

The MWWTP receives an average daily flow of 15,750 m^3/day and services an urban population of 17,683. The dry weather flow is 7,980 m^3/day and the peak wet weather flow recorded is 60,480 m^3/day.

The average daily flow is high given the size of population the wastewater scheme accommodates. It would normally be expected that the average flow for a town the size of Masterton could be approximately 5,100 m^3/day. This is primarily due to the level of groundwater infiltration that enters the reticulation network being three times higher than what would typically be expected for a municipal system of this scale.

The applicant recognises the problems with groundwater infiltration into the reticulation network and has committed $3.7 million over the next ten years to undertake investigations and capital works to reduce infiltration.

The quality of raw wastewater which enters the existing pond treatment system is better than the NZ average, primarily due to the dilution effect that groundwater infiltration will have on the raw wastewater. Table 1 below shows the quality of treated wastewater discharged from the maturation cell to the Makoura Stream:

Table 1: Treated wastewater characteristics (July 1994 - January 2006)

Parameter	Median	Range
BOD (g/m^3)	18	3-102
Suspended Solids (g/m^3)	22	2-98

Total nitrogen (g/m^3)	11	0.7-50.6
Ammonia-nitrogen (g/m^3)	5.6	0.001-35.6
Total phosphorus (g/m^3)	3.12	1.4-7.9
Dissolved reactive phosphorus (g/m^3)	2.5	0.29-4.1
Faecal coliforms (cfu/100ml)	1420	20-150,000
E.coli (cfu/100ml)	625	10-35,000

Comparisons of the raw wastewater and treated wastewater quality show that the existing pond system is effective in removing BOD, suspended solids, and pathogens, but less effective in reducing nutrients.

The retention time for wastewater in the existing pond system is 21 days during winter and 28 days during summer.

Sludge accumulated on the base of the existing ponds was surveyed in 2004. In total, nearly 80,000 m^3 of sludge has accumulated in the existing ponds. The constituents of the sludge are such that it can be classified as a biosolid.

4.4 Proposed Upgrade

Significant alterations are proposed to the existing plant and its associated processes. The proposed alterations are summarised briefly below:

4.4.1 New oxidation pond system

A new oxidation pond system with two primary ponds and five maturation cells will be constructed to the north of the existing pond system. The pond system will have the capacity to contain 275,000 m^3 of wastewater and will be fractionally larger than the existing pond system. The new ponds will be lined with 400 mm liner of compacted silty clay. Due to the placement of the new oxidation pond system, a permanent diversion of a 500 metre stretch of the Makoura Stream is required. Provision will also be made for new inlet works and pumping station

4.4.2 New discharge points

Wastewater is proposed to be discharged directly to the Ruamahanga River through a diffused outfall below the river bed upstream of the confluence with the Makoura Stream. Provision has also been made for an emergency discharge outfall to the Makoura Stream adjacent to final maturation cell. The applicant has not applied for a resource consent for this discharge as they believe that if this emergency discharge outfall is required to be used, then emergency provisions contains in s330 of the Resource Management Act 1991 can be used.

4.4.3 New land based discharge scheme

A net area of 75 hectares on either side of the Makoura Stream to the north of the proposed new oxidation ponds has been set aside for a land based discharge

scheme. In the future an additional 52 hectares on the western side of the Makoura Stream could be developed as part of the land based discharge scheme but has not been included as part of these applications. The land based discharge will be via border dyke irrigation. This method of irrigation involves contouring land to a uniform level and placing border strips at appropriate intervals (approximately 12 metres). Large volumes of wastewater will be directed into the borders for short periods at application rates of up to 150mm for each application. Appropriate return period will be managed to enable application rates of 10-15 mm/day (summer) and 0-5 mm/day (winter). At the end of each border strip which is approximately 150-200 metres long, wipe-off drains will collect any residual irrigation runoff and stormwater runoff. Any collected runoff will be discharged to either the treatment ponds, infiltration beds, or directly to the Makoura Stream in the event of heavy rainfall events. A small drip irrigation system is proposed to irrigate planted buffer areas adjacent to the Makoura Stream and western boundary of the proposed land discharge area. Finally a cut and carry pasture system is proposed for the area to be irrigated which involves periodically harvesting pasture in silage or balage.

4.4.4 New discharge regime to the Ruamahanga River

A water balance model has been used which has provided information on putting forward a discharge regime which will prevent the discharge of wastewater to the Ruamahanga River during certain river conditions. Between 1 November and 30 April there will be no discharge to the Ruamahanga River when the flow in the river is less than the median river flow (12.3 m^3/sec). Between 1 May and 31 October there will be no discharge to the Ruamahanga River when the flow in the river is less than half the median flow (6.1 m^3/sec). In any case, it is proposed to discharge wastewater to land whenever soil conditions allow during summer and winter. The difference in flow between summer and winter is based on the need to manage the river in summer for contact recreation. Additional features of the discharge regime to the river is that a minimum dilution ratio of 1:30 will apply at all times and there will be no discharge to the river when river flows are greater than 300 m^3/sec.

4.4.5 Expected wastewater quality and receiving water quality targets

The applicant has proposed the same wastewater quality targets currently set in the existing consent with better targets for E.coli to reflect the improved treatment system. The applicant has also proposed receiving water quality targets for the Ruamahanga River after reasonable mixing. Numerical targets have been proposed for a number of parameters except dissolved reactive phosphorus.

4.4.6 Decommissioning of the existing oxidation ponds and construction of on-site sludge landfill

The existing oxidation ponds will be decommissioned and desludged. This process will also involve dewatering the base of the ponds. The sludge material (once dried) will be disposed of to a purpose built sealed and capped landfill at the north-eastern end of the decommissioned ponds. Following establishment

of appropriate grass cover the 22 hectare area of the existing ponds is proposed to be used as part of the land based discharge scheme.

4.4.7 Stopbank upgrade and minor river works

The stopbank on the right bank of the Ruamahanga River upstream of the existing pond system is proposed to be upgraded to a 1:100 year flood return standard. Also a 60 metre planted buffer zone for river and erosion control will be created in an area adjacent to the decommissioned ponds with minor bank protection works at various sites.

4.5 Proposed timing of upgrade

If consents are granted, the applicant has identified the detailed design, contract documentation and tender letting will occur in 2009 with the commencement of construction scheduled for mid-2010. The earthworks for the proposed new pond system and land based discharge scheme will be undertaken in the summer of 2010/2011, with commissioning of the new scheme planned for mid-2011.

When the existing pond system is decommissioned, the sludge from the base of the existing ponds will be air dried in the summer of 2011/2012, and then landfilled. The applicant has also built in a contingency period which may mean the scheme would not be completed until mid-2015.

5. Other consents and approvals required

5.1 Notice of requirement

A designation covers the existing site of the MWWTP, but not the additional 107 hectares most recently purchased on the western side of the Makoura Stream. Accordingly this process includes a notice of requirement to alter and amend the existing designation. A separate officer's report from Masterton District Council has been prepared in relation to the notice of requirement.

5.2 Gravel extraction

Some gravel material may be required to be sourced from the local river environment. This would normally require a resource consent from Greater Wellington, however as the Flood Protection Department of Greater Wellington hold an existing resource consent to extract the sustainable yield of gravel from the Ruamahanga River system, the applicant will seek a license from the Flood Protection Department at a later date if required.

6. Consultation

The applicant has provided detailed information about the consultation process they have employed since 2003. A Consultation Task Group was established which included key stakeholders including iwi authorities, Wellington Fish & Game Council, Dairy Farmers of NZ (Wairarapa), and industry. Other consultation methods were adopted by the applicant including

workshops/meetings with individual persons or organisations, open days, and site visits.

A number of issues have been raised by persons or organisations consulted. These have been clearly summarised by the applicant in section 11 of the AEE. The applicant believes that most of the concerns raised by such persons or organisations have been addressed and that the proposal delivers the best practicable option for the long term upgrade of the plant.

Concerns have been expressed by submitters in their submissions about the lack of effective consultation. As Greater Wellington has not been a party to the majority of the consultation process it is not appropriate to provide comment on the effectiveness of the consultation process. On face value, some of the minor issues appear to have been worked through, however the majority of core issues raised by submitters have not been advanced to any great degree which is now subject to this hearing process.

7. Notification and submissions - 2007

Section 93(1)(b) of the Act requires that a consent authority must notify an application for a resource consent unless the consent authority is satisfied that the adverse effects of the activity on the environment will be minor.

As the adverse effects of the discharges from the MWWTP on the environment have the potential to be more than minor, public notification of this application was required.

7.1 Notification of 2007 application (WAR 070077)

The original application received in May 2007 was publicly notified in the *Wairarapa Times Age* and *Wairarapa News* on Wednesday 4 July 2007. Notification of the application was also posted on the Greater Wellington website, and signs notifying the public were erected at the main entrance to the MWWTP and Ruamahanga River at Wardell's Bridge.

A number of parties were directly notified of the application, including neighbouring landowners within 500 metres of the MWWTP site, the Department of Conservation, Wellington Fish & Game Council, Wairarapa Public Health, Carterton District Council, South Wairarapa District Council, iwi authorities, local environmental groups and community groups.

Masterton District Council notified the notice of requirement in a separate process in June 2007.

7.2 Submissions received on 2007 application (WAR 070077)

The submission period closed at 4:30pm on Wednesday 1 August 2007. 10 submissions were received after the closing date. These submissions did not raise any substantive new matters and the applicant has no issue with these late submissions being accepted.

Greater Wellington received 69 submissions in total. 48 of the 69 submitters requested that they wished to be heard at a hearing. 63 of the submissions oppose the proposal as outlined in the application, 1 submitter supported the application, and 5 submitters expressed either a mixed position (support and oppose) or neutral position.

A wide range of issues were contained in the submissions. Key issues highlighted by submitters included:

- Leakage from existing pond system.
- Discharge of wastewater into Ruamahanga River and its associated effects.
- Concerns about odour from management of activity.
- Potential impact of land based discharge on domestic groundwater bores.
- Cultural effects of discharge wastewater to water.
- Potential impact of raising stopbank on landowners to the east of the Ruamahanga River.
- Concerns about the viability and suitability of the land based discharge scheme.
- Consultation process has been inadequate and poor.
- The amount of groundwater infiltration into the reticulation network.
- The limited buffer zones to neighbouring land, particularly to the north of the site.
- The consent term sought of 35 years.
- The proposed monitoring regime put forward by the applicant.

A summary of submissions was sent to all submitters and the applicant on 15 August 2007. A copy of the summary of the submissions is available on request.

8. Further information and meetings - 2007

8.1 Further information request

Following the receipt of submissions, further information regarding wastewater quality, infiltration and inflow, land based discharge system, pond seepage/leakage, river discharge, flood protection works, and other minor pieces of information was requested on 24 August 2007. This request was made in accordance with section 92 of the Resource Management Act 1991.

A full and final response to this request was received by Greater Wellington on 23 October 2007. A copy of this response was made available to all submitters

on 2 November 2007, via posting the information on the Greater Wellington website.

8.2 Pre-hearing meeting

A pre-hearing meeting was organised and held on 12 November 2007. The purpose of the meeting was to enable the applicant to outline the proposal and for submitters to discuss the concerns and issues raised in their submissions. The key issues and topics discussed at the pre-hearing meeting were:

- Effects of the discharge on water quality in the Ruamahanga River.
- Pond leakage.
- Irrigation.
- Flooding and erosion risks.
- Community.
- New designation.
- Infiltration and inflow.
- Alternatives.

The applicant stated at this meeting that they were currently reviewing 107 hectares of additional land purchased in 2007. They indicated that this may entail moving the ponds to a new site but such a decision would be made by the full Council in late December 2007.

Notes were taken of the pre-hearing meeting and distributed to the applicant and submitters on 13 December 2007. A copy of the notes is available on request.

8.3 Site visit

A site visit was completed by Greater Wellington staff and their experts in conjunction with the applicant on 19 December 2007.

9. Notification and submissions - 2008

Following the decision of the applicant to change key aspects of the original proposed upgrade in December 2007, the applicant lodged a fresh set of resource consent applications and notice of requirement to Greater Wellington on 20 August 2008. These applications were assessed and identified for public notification under Section 93(1)(b) of the Act as per the original applications.

9.1 Notification of 2008 application (WAR 090066)

The revised application was publicly notified in the *Wairarapa Times Age* and *Wairarapa News* on Wednesday 17 September 2008. Notification of the

application was also posted on the Greater Wellington website, and signs notifying the public were erected at the main entrance to the MWWTP and Ruamahanga River at Wardell's Bridge.

All persons and organisations notified originally in 2007 were notified of the revised applications as well as all submitters who made a submission on the original 2007 application. It was made clear to all submitters that if they continued to wish to be heard at a hearing that a new submission would need to be lodged.

Greater Wellington and Masterton District Council jointly notified the revised resource consent applications and notice of requirement.

9.2 Submissions received on 2008 application (WAR 090066)

The submission period closed at 4:30pm on Wednesday 15 October 2008. 1 submission was received after the closing date. The submission did not raise any substantive new matters and the applicant has no issue with this late submission being accepted.

Greater Wellington received 30 submissions in total. 26 of the submissions oppose the proposal as outlined in the application, and 4 submitters expressed either a mixed position (oppose in part) or neutral position.

A pre-hearing meeting for the 2008 application was not held as it was considered more efficient use of time to proceed straight to a hearing. The applicant also did not request a hearing.

9.2.1 Nature of submissions

The issues raised by submitters are briefly summarised below in no particular order. These issues are addressed in section 12 of this report (assessment of effects), and a summary of individual submissions is attached as Appendix 5.

(a) Consultation

A few submitters expressed concern about the lack of consultation and the consultation process adopted.

(b) Method of land based discharge

Many submitters are concerned about the method of land based discharge chosen by the applicant. They believe that border strip irrigation is outdated and that there are viable and sustainable alternatives that would see wastewater better utilised as a resource. Alternatives suggested by some submitters include more drip line irrigation, spray irrigation, and increased storage of wastewater. Some of those submitters are particularly concerned about the impact of a similar discharge from the Waingawa freezing works in the 1980's and its subsequent effects on soils and groundwater.

(c) Discharge to river

A number of submitters remained concerned about the quantity of wastewater that will still be discharged to the Ruamahanga River. Many of those submitters have a long term desire to see a nil discharge to the river. Concerns also centre around the environmental effect of discharging wastewater to the river and the cumulative effects of the discharge on the wider Ruamahanga River system. One submitter adjacent to the Ruamahanga River is particularly concerned about the shifting of the discharge point directly to the river upstream of a water abstraction point. Another submitter was concerned about the impact of the discharge on angling opportunities and other recreational users.

(d) Proximity to neighbouring landowners

Whilst the revised proposal has increased buffer zone distance to neighbouring properties, some submitters are still concerned about the proximity of the plant to neighbouring properties and the potential effects of odours and the land based discharge.

(e) Infiltration and inflow

Some submitters remain concerned about the level of groundwater infiltration into the reticulation network.

(f) Consent term

A number of submitters oppose the consent term sought by the applicant of 35 years.

(g) Construction effects

A couple of submitters raised concerns about potential effects during the construction phase of the upgrade, particularly increased sedimentation into the Ruamahanga River and noise and traffic issues.

(h) Iwi concerns

Both Rangitaane o Wairarapa and Kahungunu ki Wairarapa believe that the applications do not satisfy sections 6(e) and 7(a) of the Act and oppose the discharge of wastewater to water on cultural grounds. Many of their other concerns are also summarised in other sections above.

10. Statutory reasons for requiring resource consents

10.1 Discharges to fresh water

Under section 15(1)(a) of the Act, no person may discharge any contaminant or water into water unless expressly permitted by a rule in a regional plan, a resource consent or regulations.

The definition of water in Section 2 of the Act includes freshwater. In relation to discharges to water, Section 2 of the Act defines "contaminant" as any substance that "*when discharged into water, changes or is likely to change the physical, chemical, or biological condition of the water".*

The discharges will include compounds that will change the physical, chemical and/or biological nature of the water into which they are discharged, and can be classed as contaminants under the Act.

The relevant regional plan for the proposed discharges to water is the Regional Freshwater Plan for the Wellington Region (RFP).

There are four different types of proposed discharges to water in the applications:

1. Discharge of treated wastewater to the Ruamahanga River.

2. Discharge of stormwater runoff from the wastewater irrigation land to the Ruamahanga River and Makoura Stream.

3. Discharge of sediment laden stormwater to the Ruamahanga River and Makoura Stream arising from bulk earthworks operations during the construction process.

4. Discharge of treated wastewater and groundwater arising from dewatering during the construction process.

The proposed discharges outlined above are not specifically provided for by any of the rules of the RFP. Therefore, they fall under Rule 5 - All remaining discharges of freshwater, and are considered as **discretionary activities** and resource consents are required for all of these discharges.

As each of these discharges is a distinct activity in its own right, they have been separated into four separate resource consent applications.

10.2 Discharges to land

Under section 15(1)(b) of the Act, no person may discharge any contaminant or water into land unless expressly permitted by a rule in a regional plan, a resource consent or regulations.

In relation to discharges to land, Section 2 of the Act defines "contaminant" as any substance that "…*when discharged into land, changes or is likely to change the physical, chemical, or biological condition of the land".*

The discharges will include compounds that will change the physical, chemical and/or biological nature of the land into which they are discharged, and can be classed as contaminants under the Act.

The relevant regional plan for the proposed discharges to land is the Regional Discharges to Land Plan for the Wellington Region (RDLP).

There are three different types of proposed discharges to land in the applications:

1. Discharge of treated wastewater to land via an irrigation system.

2. Discharge of partially treated wastewater to land and groundwater via the base of the existing oxidation ponds and new oxidation ponds.

3. Discharge of wastewater sludge and residual liquid to land from the sludge dewatering process and sludge landfill.

Rule 8 of the RDLP states that any discharge containing human sewage onto or into land is a discretionary activity unless the discharge is allowed by Rule 3, 5, 6, or 7. The proposed discharge does not meet the criteria of Rule 3, 5, 6, or 7 and are considered as **discretionary activities** and resource consents are required for all of these discharges.

As each of these discharges is a distinct activity in its own right, they have been separated into three separate resource consent applications.

10.3 Discharge to air

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

Section 2 of the Act defines "contaminant" as "*including any substance (including gases, odorous compounds, liquids, solids, and micro-organisms), that either by itself or in combination with other substances, energy, or heat, that is likely to change the physical, chemical, or biological condition of the air into which it is discharged*".

Discharges from the treatment of wastewater will include compounds that may change the physical or chemical nature of the air into which they are discharged, and are classed as contaminants under the Act.

Section 2 of the Act defines "industrial or trade premises" as including any premises used for the storage, transfer, treatment, or disposal of waste materials or for other waste-management purposes. Therefore, the MWWTP can be classed as an industrial or trade premises.

The relevant regional plan for the proposed discharge to air from the MWWTP is the Regional Air Quality Management Plan for the Wellington Region (RAQMP).

Rule 21 of the RAQMP allows for the discharge of contaminants into air in connection with sewage treatment and disposal as a permitted activity. This rule *excludes* discharges to air associated with the treatment of sewage off the site on which it was generated (e.g. municipal sewage treatment).

Rule 23 of the RAQMP considers any activity that is explicitly excluded from Rules 1-22 as a **discretionary activity**; therefore the discharge to air from MWWTP requires a resource consent.

10.4 Other ancillary construction related activities

10.4.1 Taking and diverting water

Under section 14(1)(a) of the Act, no person may take or divert any water unless expressly permitted by a rule in a regional plan, a resource consent or regulations.

The relevant regional plan for the proposed taking and diversion of water is the Regional Freshwater Plan for the Wellington Region (RFP).

There are three different types of proposed taking and/or diversion of water in the applications:

1. Diversion of floodwaters in the Ruamahanga River as a result of upgrading and raising the existing stopbank adjacent to the Ruamahanga River.

2. Diversion of the Makoura Stream around the new oxidation ponds.

3. Taking and diverting groundwater arising from dewatering processes from cut-off and drainage trenches.

The proposed discharges outlined above are not specifically provided for by any of the rules of the RFP. Therefore, they fall under Rule 16 - Taking, use, damming, or diversion of water, and are considered as **discretionary activities** and resource consents are required for all of these takes and diversions.

As each of these activities is a distinct activity in its own right, they have been separated into three separate resource consent applications.

10.4.2 Structures in the river bed and associated bed disturbance

Under section 13(1)(a) & (b) of the Act, no person may in relation to the bed of any river place any structure or disturb the bed unless expressly permitted by a rule in a regional plan, a resource consent or regulations.

Section 2 of the Act defines "bed" as "*the space of land which the waters of the river cover at its fullest flow without overtopping its banks*". The proposed structures and bed disturbance are within the limits of the bed defined in the Act.

The relevant regional plan for the placement of structures and bed disturbance is the Regional Freshwater Plan for the Wellington Region (RFP).

The applicant proposes to construct, place, use, and maintain a diffuser outfall structure in the bed of the Ruamahanga River. As a result of this activity, the applicant will be disturbing the bed of the Ruamahanga River during this construction and maintenance process. In addition to this the applicant will be

disturbing the bed of the Ruamahanga River when undertaking construction and maintenance works on erosion protection works.

The proposed activities within the river bed discharges outlined above are not specifically provided for by any of the rules of the RFP. Therefore, they fall under Rule 49 - All remaining uses of river beds, and are considered as **discretionary activities** and resource consents are required for the proposed structure and bed disturbance.

11. Matters for consideration

The requirements of the Act that relate to the decision making process are contained within sections 104-116. The sections of particular relevance to this application are listed below, and the relevant sections of the Act are presented in their entirety in Appendix 4 of this report.

The matters to which Greater Wellington (as the consent authority) shall have regard to when considering applications for resource consents and related submissions are set out in Sections 104, 105 and 107 of the Act.

Section 104(1) of the Act**,** states that when considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to:

(a) any actual and potential effects on the environment of allowing the activity;

(b) any relevant provisions of –

(iii) the Regional Policy Statement for the Wellington Region;

(iv) the Regional Freshwater Plan, Regional Discharges to Land Plan, and the Regional Air Quality Management Plan; and

(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.

Part 2 (purpose and principles) of the Act is presented and discussed in section 13.1 of this report.

The actual and potential effects on the environment of allowing the activities are addressed in section 12 of this report.

The relevant provisions of the Regional Policy Statement, the Regional Freshwater Plan, the Regional Discharges to Land Plan, and the Regional Air Quality Management Plan are discussed in sections 13.2, 13.3, 13.4, and 13.5 of this report.

The other relevant matter to this application is the New Zealand Waste Strategy. This is considered in the section on sludge disposal in section 12.4.3 of this report.

Under **Section 104B** of the Act a consent authority after considering an application for resource consent for a discretionary activity may grant or refuse an application. If it grants an application, it may impose conditions under section 108 of the Act.

Section 105 of the Act lists additional matters that a consent authority must have regard to when considering applications for discharge permits to do something that would contravene section 15 of the Act. These matters are:

(a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects;

(b) the applicant's reason for the proposed choice; and

(c) any possible alternative methods of discharge, including discharge into another receiving environment.

These matters are addressed in section 12 of this report.

Section 107(1) of the Act places restrictions on the grant of discharge permits for the discharge of contaminants into water. Such permits shall not be granted by a consent authority if they cause any or all of the following effects in receiving waters after reasonable mixing:

(a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;

(b) any conspicuous change in colour or visual clarity;

(c) any emission of objectionable odour;

(d) the rendering of freshwater unsuitable for consumption by farm animals;

(e) any significant adverse effect on aquatic life.

Section 107(2) of the Act states that a consent authority can only grant a coastal or discharge permit that may allow any of the effects listed in section 107(1) if it is satisfied that:

(a) exceptional circumstances grant the discharge or the permit; or

(b) the discharge is of a temporary nature; or

(c) the discharge is associated with necessary maintenance works –

and that it is consistent with the purpose of the Act to do so.

The effects listed in section 107(1) of the Act are discussed in section 12 of this report.

12. Assessment of effects

Section 88 of the Act requires the applicant to make an assessment of any actual or potential effects that the proposed activity may have on the environment and the ways in which any adverse effects may be mitigated. Section 88 requires that any such assessment shall be in such detail as corresponds with the scale and significance of the actual and potential effects that the activity may have on the environment.

Two technical review reports were prepared on behalf of the Council to form part of this section 42a report. The reports can be found in Appendix 1 and 2 and should be read in conjunction with this report. The reports relate to the effects of the discharges to land and the effects of the discharges on surface water quality respectively.

The approach taken by the technical reviewers in their reports, has generally been to focus on those matters where there are any unsolved issues, differences of opinion or matters not adequately covered in the AEE. That is, it is not the intention to present an opinion on the many matters that have been adequately addressed in the AEE, but to concentrate on those matters that in their opinion have warranted further attention.

This section of the report is structured as follows:

Section 12.1 summary of the sensitivity of the receiving environments

Section 12.2 phasing out of existing discharge

Section 12.3 consideration of alternatives

Section 12.4 assessment of the effects of the proposal.

The assessment below identifies some uncertainties about some of the technical aspects of the proposal and therefore raises concerns about the possible effects of the discharges. A decision was made by Greater Wellington not to request any further information under section 92 of the Act. This decision was influenced by the community expectation that these new consent applications would have been lodged in time so that the proposed upgrade would be operational by 20 January 2010 when the current consents expire. Considerable time had already passed and there was a need to consider any further delays. It was also influenced by the fact that some of the issues identified to the applicant in a June 2008 letter from Greater Wellington to the applicant had not been addressed in the 2008 AEE. The purpose of the letter was to provide an overview of the key issues to date that staff (including experts engaged by Greater Wellington) saw with the proposed upgrade of the MWWTP (see Appendix 3). It was not intended to be an exhaustive and complete list but merely a guide as to some of the key issues identified from a preliminary assessment of the original 2007 application.

As can be expected with applications of this nature, the proposal has evolved over a number of years. This means that some recommendations and

conclusions reached in technical reports that support the AEE were based on earlier designs. Care as been taken in auditing the application to ensure that the most recent information is used. It is expected that if any discrepancies are identified by the applicant these would be noted at the hearing.

12.1 Receiving environment

Section 105(1) of the Act requires regard to be had to the nature of the discharge and the sensitivity of the receiving environment to adverse effects. The application and technical reports together provide a comprehensive description of the receiving environments which are summarised below.

12.1.1 Ruamahanga River

The Ruamahanga River headwaters are in the northern part of the Tararua Ranges with the river in the vicinity of the site flowing primarily through pasture land before, some 68 km downstream, entering Lake Onoke. The lake is a highly modified shallow coastal lake/estuary receiving high nutrient, sediment and pathogen inputs. The lake is the ultimate receiving environment for the MWWTP which, despite being highly modified, has considerable human uses and values, particularly fishing, boating and natural character.

The flow in the river is variable - freshes are frequent in both summer and winter but the river can also experience prolonged periods of low flows between January and April. The river also has a history of intense flood events such that there is an existing stopbank along the true right bank of the river from Masterton to the site. This reach of Ruamahanga River is managed by Greater Wellington as part of the river management scheme. The stopbank protects the Homebush area. The objective of the scheme is to mitigate erosion of farm land, and manage bank erosion to reduce land loss. Makoura Stream flows into the river just below the oxidation ponds.

The RFP seeks to manage the lower and mid Ruamhanga River for contact recreation purposes and trout angling. The RFP also states that the river is regionally important for its amenity and recreational values. The river is used for jet boating, canoeing, kayaking, fishing, swimming and food gathering. The river is the principal trout fishery in the Wairarapa and ranked the third most highly visited fishery in the Wellington Fish and Game region. Downstream of the discharge the nearest swimming area is at Wardell's Bridge (approximately 200 m downstream of the Makoura Stream confluence) with the closest 'public' area at "The Cliffs" approximately 7.5 km downstream. There is also a swimming hole opposite the oxidation ponds that can only be accessed via private land.

The existing water quality of the Ruamahanga River is affected by diffuse and point sources of pollution. Overall, water quality in the river at Homebush is generally fit for its intended management purposes with the key exception being immediately following rainfall and, at times during low river flows, when dilution of the MWWTP discharge is reduced. The MWWTP discharge - which is the most significant (in terms of volume and contaminant loadings) of five significant wastewater discharges the Ruamahanga River system receives -

results in a reduction in water clarity, increased nutrient and indicator bacteria concentrations and an increase in benthic periphyton biomass downstream of the Makoura Stream confluence.

12.1.2 Groundwater

The site of the MWWTP is within the Te Ore Ore groundwater zone. Of the four aquifers, the uppermost aquifer is unconfined or semi-confined and typically 5 to 15 metres thick with the depth to the water table varying seasonally between 1 to 4 metres.

At the MWWTP site groundwater on the eastern side flows towards the river, at the centre and to the west it flows due south while at the southern end it flows directly south towards the river. The groundwater level is typically less than 2 metres from the surface. There is a significant hydraulic connection between the shallow aquifer and the river. It is important to note that along the majority of the site the river gains from groundwater during average flows. At times of flood events there is a rapid increase in groundwater levels suggesting that under flood conditions the river is a significant contributor to local groundwater. During periods of increased flow the rise in groundwater closely follows river flow increases. The applicant states that given the short nature of floods they have little influence on the average groundwater levels and therefore flow direction.

Groundwater quality around the MWWTP site has been monitored since 2003 as part of the existing resource consent conditions. The monitoring shows that groundwater quality up-gradient of the ponds, with the exception of *E. coli,* complies with the New Zealand Drinking Water Standards 2005.

12.1.3 Soils

The 97 hectare (net area) land irrigation scheme is to be constructed on parts of what is referred to as the 91 and 107 hectare sites. The applicant states that an additional net area of 52 hectares could be developed in the future but does not form part of these applications.

Proposed land areas	Possible future land areas
Site: 91 ha & 107 ha – 75 ha net area	Site: 107 ha – 52 ha Note: this does not form part of these applications
Site: exiting ponds – 22 ha	
Total net area 97 ha net area	

Investigations of the soils at the site were undertaken by HortResearch in 2007. The soils on the 91 and 107 hectare sites are different. The 91 hectare site is located on a former floodplain of the Ruamahanga River meaning the soils have been formed from river alluvium, comprising gravely sediments overlain be predominately sandy and silty alluvial sediments. There are clay rich soil materials at shallow depths that cause poorer draining soils (in the south-west area). However, overall the site is predominately well-moderately drained. The applicant expects that crop growth will be nitrogen limited. The

107 hectare site has finer textured soils than those on the 91 hectare site with much of the western part of the site poorly drained.

12.1.4 Air quality

The applicant states that the nearest dwelling to the proposed new ponds is 540 metres away in a south-westerly direction and the nearest dwelling to the proposed irrigation area is approximately 150 metres (including buffer area) to the east. The prevailing wind is from the north east.

Under the current resource consent, odour is monitored weekly at the downwind side of all three existing oxidation ponds. Historically the oxidation ponds have not caused odours that have resulted in complaints with the exception of a one-off event in August 2005.

12.2 Phasing out of Existing Discharge

The applicant states that the upgrade may not be completed until mid-2015. As the current consents expire in 2010 these applications will also need to provide for the continued operation of the existing discharge, and conditions would need to be based on the proposed timing of works.

An interpretation of the proposed works required and possible timing is:

Phase of work	Timing
Detailed design and tender let	2009
Preparation of site, diversion of Makoura Stream and construction of new inlet works	commence mid-2010
Earthworks for new pond, earthworks for irrigation scheme	2010/11 summer
New ponds commissioned	mid-2011
Irrigation scheme commissioned	spring 2011
Sludge drying and landfilling finished	2011/12 summer contingency 2012/13 summer
Existing pond area returned to pasture followed by use as an irrigation area when pasture suitable	2012/13 summer contingency 2013/14 summer

However the applicant states that should one summer season not be sufficient to complete the sludge drying operation a second summer period would be needed, 2012/13.

As the upgrade will be staged over a period of up to five years, the existing effects are expected to continue in their present form, or a reduced form during the latter part of this period. For this reason the effects of the existing operation on surface water quality are discussed below as opposed to being in the main assessment of effects (section 12.4). The AEE is relatively silent on

the need for the consent to provide for the existing discharge however it is implicit in the application, and the effects of the existing discharge are covered in the AEE.

The key conclusions that can be reached about the existing discharge are:

- it is having significant adverse effects on the Makoura Stream reflecting the significant volume of effluent discharged relative to stream flow (i.e. very little dilution); and
- the discharge from the Makoura Stream to the Ruamahanga River and leakage from the oxidation ponds are affecting the Ruamahanga River.

The applicant agrees that the degraded water quality in Makoura Stream is due to the discharge however they state that the effects on the Ruamahanga River are minor primarily due to the result of incomplete mixing at the point where compliance monitoring occurs. The existing effects are considered in the surface water quality technical report which concludes that the effects are both significant and adverse because:

- decreased clarity and elevated dissolved nutrient concentrations extend down to just above the confluence of the Ruamahanga and Waingawa rivers, some 700 metres downstream of the Makoura Stream outflow;
- dissolved reactive phosphorus concentrations (a key determinant of periphyton growth) consistently exceed the ANZECC (2000) lowland trigger value for aquatic ecosystems at both Wardell's Bridge and above the Waingawa River confluence;
- periphyton surveys have consistently reported greater algal biomass downstream of the discharge; and
- macroinvertebrate surveys have reported a lower quality macroinvertebrate community downstream of the discharge.

While it is clear that the existing discharge is having an adverse effect on the environment the community requires a means of wastewater disposal to provide for the health, well being and safety of the residents. The continued operation of the existing facilities is therefore required on a temporary basis until no later than November 2011 and possibly earlier.

Section 107(2) of the Act states that a consent authority can only grant a coastal or discharge permit that may allow any of the effects listed in section 107(1) if it is satisfied that:

(a) exceptional circumstances grant the discharge or the permit; or

(b) the discharge is of a temporary nature; or

(c) the discharge is associated with necessary maintenance works –

and that it is consistent with the purpose of the Act to do so.

It is considered that the discharge would be of a temporary nature.

12.3 Consideration of Alternatives

Before discussing the effects of the proposal the alternatives are considered. The Fourth Schedule of the Act states that an application should include a description of possible alternative locations or methods for undertaking the activity, where it is likely that an activity will result in any significant adverse effect on the environment. Moreover section 105(1) of the Act requires regard to be had to the applicant's reasons for the proposed choice; and any possible alternative methods of discharge, including discharge into another receiving environment.

The applicant has stated that the proposal meets the social and cultural, environmental and economic objectives set for the project.

The applicant has included a description of any possible alternatives to their proposal in their application. I note that it is not the consent authority's role to assess whether the best option has been selected, but rather to determine whether the adverse effects of the chosen proposal have been adequately assessed and can be appropriately avoided, remedied or mitigated. The effects of the proposal are considered below.

The applicant has considered alternative treatment and disposal methods based on four general schemes: retention of the existing oxidation ponds; new oxidation ponds; dual power lagoons; and mechanical treatment plants. The application provides extensive detail on the history and option investigations undertaken so is not repeated here. It is noted though that the applicant made a significant change to the proposal in December 2007 following the review of options with the decision to construct new oxidation ponds.

12.4 Proposal - Assessment of Effects

12.4.1 Introduction

In order to consider the effects on the environment from the proposal it is necessary to consider the existing environment and the permitted baseline. The existing environment has been considered above and it is noted that it does include the existing consent which expires in less than 12 months. It is also noted that the existing consent conditions require that the consent holder implement a long-term upgrade of its wastewater reticulation, treatment and disposal system. This indicates that the existing discharge was not seen as acceptable in the longer term.

Section 104(2) of the Act provides that a consent authority may disregard an adverse effect of an activity on the environment, if a Plan permits an activity with that effect. The application of Section 104(2) is discretionary. In relation to this application there are no relevant permitted activities to consider.

This assessment does not take into consideration the 'possible future land treatment area' (107 hectares) shown on the plans in the AEE however it is noted that the applicant has included that land within designation application to Masterton District Council. A number of submissions were received in

opposition to this approach as they state that the significant investment required for the proposed works raise an expectation that consents required for the possible future land treatment area will be difficult to decline.

The proposal will differ in its effects from those of the existing discharge, due to planned upgrades to the MWWTP and changes to the discharge regime.

Section 4.4 outlined the proposed changes to the existing discharge regime. To summarise, under the proposed new discharge operation, irrigation of treated wastewater to land will occur whenever soil conditions allow with no direct discharge to the Ruamahanga River whenever:

~~a)~~(a) the river drops below median flow of 12.3 m^3/s in summer (1 November to 30 April) or half median flow of 6.1 m^3/s in winter (1 May to 31 October); or

~~b)~~(b) the river flow is less than 30 times greater than the discharge rate (i.e., minimum dilution of 30x); or

~~c)~~(c) the river flow is greater than 300 m^3/s.

The applicant states that the maximum discharge to the Ruamahanga River at any time will be 1,200 L/s.

12.4.2 Summary of effects of discharges to land and surface water

The discharges to land and to surface water are the two main categories under which the effects of the proposal need to be considered. The key conclusions reached in the assessment below are:

Discharge to land:

- The application to discharge to land is land disposal not land treatment system.
- There is a high degree of uncertainty over the land irrigation operation and therefore the effects on the receiving environment given the uncertainty with the modelling, application rates, suitability of the soils, and the need for sound management.
- Robust monitoring of the land application system is essential to assess the performance of the site and flag any issues that may arise which could limit the sustainability of the operation. It is also essential to ensure that the claimed predicted effects are not exceeded, of which there is some question about given the uncertainty of the modelling and proposed management which has been presented to date.
- The long term disposal of sludge to landfill is considered inappropriate.

Discharge to surface water:

- The proposed upgrades to the MWWTP and changes to the discharge regime mean that the adverse effects associated with the existing discharges will be reduced significantly, with the Ruamahanga River at Wardell's Bridge expected to be suitable for contact recreation as a result.

- The Ruamahanga River will remain the principal receiving environment for the majority of the year, with more wastewater discharged to the river than irrigated to land.

- The proposed treatment upgrades are only predicted to improve wastewater quality by reducing bacteria levels during summer and may result in higher bacteria levels being discharged during winter.

- The proposed minimum river flow to effluent dilution ratio of 30:1 will provide less dilution in the river than at present and is insufficient to ensure that dissolved reactive phosphorus receiving water quality guidelines can always be met.

- The proposed maximum instantaneous discharge rate of 1,200 L/s is significantly higher than the existing 700 L/s and will enable a greater contaminant load to be discharged to the river.

- There is significant potential for greater than anticipated nutrient inputs into both the Makoura Stream and the Ruamahanga River via seepage through groundwater underneath the proposed land irrigation area and the base of the new oxidation ponds.

12.4.3 Soils and Groundwater

The technical audit of the land irrigation system considers the proposal in three components: discharges to land from the ponds; sludge disposal; and the land application area. Within the three components 33 specific matters are raised. The three sections below pull together the key matters that are well documented in the technical report.

Throughout the AEE the terms "land treatment" and "land disposal" are used. The technical report prepared by Duffill Watts concludes that the proposed operation is a land disposal operation. Some treatment will be achieved but the proposed operation is not specifically designed to provide a high degree of land treatment. This is evident by the use of infiltration systems to allow rapid discharge to groundwater.

It is noted that we are aware that further work is being undertaken by HortResearch and is likely to be presented at the hearing. It is unclear exactly what this further work relates to, but it may include an assessment of the additional area of land (107 ha site) which was not in the current HortResearch (2007) report. This is important as a number of the other technical reports rely on the HortResearch report (e.g. PDP modelling report) and while other reports have been updated to include the additional land, it is not clear whether the

assumptions applied and resultant outputs reflect the effects that could occur under the now expanded system.

(a) Discharge to land from the ponds

With the construction of new ponds it is expected that the pond liner will be of a lower permeability (in the range of 1 to 5 x 10^{-9} m/s) and result in a lower volume of leakage compared to the current ponds. The new ponds are predicted by the applicant to have a leakage rate of 150 m^3/d compared to the current rate of anywhere between 490 and 2,400 m^3/d. Less leakage also means that greater storage is required.

The integrity of the pond liner is therefore important in reducing the volume of leakage. Should leakage occur at a greater rate than stated, the groundwater contamination rates, and therefore effects on the river, could be greater than predicted.

The applicant proposes to transfer wastewater from the existing ponds to the new ponds to prevent cracking and shrinkage of the liner. Maintenance of earthen pond liners can be difficult, and exposure due to low water levels can cause cracking. Any cracking will compromise the integrity of the liner and lead to leakage rates much higher than those predicted. This issue will have to be carefully managed by the applicant in the storage ponds, which will have a fluctuating pond level. Leakage rates will be able to be monitored as part of the groundwater quality monitoring.

While the leakage from the ponds to the Ruamahanga River will decrease significantly there is still a need to consider the effects of the leakage as an indirect discharge to the river. Those effects are considered as part of the assessment on surface water quality.

(b) Sludge disposal

The decommissioning of the existing oxidation ponds means that the accumulated sludge needs to be removed. Resource consent has been sought to discharge to land sludge and residual liquid from the sludge dewatering process and in the long term, the discharge from the sludge landfill. The sludge in the existing ponds is proposed to be air dried in-situ with the dried sludge being "stored" in a landfill area constructed in the north-west corner of existing pond 1. The landfill is to be capped to prevent water ingress. A second landfill area in the north-east corner of existing pond 2 is proposed to allow for future sludge storage from the new oxidation ponds at a future date of about 30 years ('future sludge landfill' as marked on the plans with the AEE).

There is limited detail in the AEE on the proposed sludge drying and landfill disposal operation. The applicant may wish to consider addressing the following at the hearing:

- leachate collection and discharge;
- management of stormwater during drying;

- the landfill cap; and
- management of the landfill.

The technical review has recommended a number of conditions that I consider appropriate and therefore have been included in the set of conditions attached to this report.

The AEE states that the sludge can be classified as a biosolid and therefore could be applied to land subject to site specific controls. The reasons stated by the applicant for proposing landfilling, as opposed to beneficial reuse, is because it is the lowest cost and avoids the need to remove the sludge offsite (disposal onsite is not considered suitable). The technical report considers that beneficial reuse of biosolids should be considered in future rather than landfilling of the sludge.

The Regional Policy Statement through Objectives 1 and 2 aims to reduce the volume of waste generated and minimised through reuse, recycling, and resource recovery. At a national level the New Zealand Waste Strategy (2002) is a long-term strategy to help reduce and better manage waste in New Zealand. The strategy includes a number of national targets for priority waste management areas. This strategy covers solid, liquid and gaseous waste. It encourages the reuse of biosolids from municipal wastewater treatment plants.

While it is accepted that cost is an important factor for the Masterton community, it is considered inappropriate to be seeking to dispose of biosolids to landfill in 30 years time. This would be in direct contradiction to the policy direction. There is also no information in the AEE about the likely toxicants and levels of concentrations that could be expected in the sludge that would come from the new oxidation ponds meaning the effect of the future activity cannot be assessed. Given this it is recommended that consent for the discharge of sludge excludes the 'future sludge landfill' area.

(c) Land application area

The application of wastewater to land and leakage from the oxidation ponds is likely to cause some effect on groundwater quality and levels. The main effects that need to be considered are: nutrient leaching, soil drainage and groundwater mounding. These all relate to the suitability of the soils for the proposed application regime.

The AEE states: *"the irrigation will not compromise the long-term sustainability of the soils. Analysis, indicates that there is at least 28 years life (and likely longer) in the soils' capacity to accept the effluent under the operation proposed. Border-strip irrigation has been selected as the irrigation method because the 7 to 10 day application cycle will allow soils to drain and to re-aerate, thus avoiding anoxic conditions and soil damage."*

(i) Application rates

The proposed application regime and effects are based on parameters selected as inputs to an extensive modelling exercise the applicant carried out. Therefore it is necessary to consider the approach to the modelling, including any assumptions made. The following matters were raised in the technical report:

- It is not clear if the various parameters (such as the nitrogen and pathogen leaching rate) that are modelled in the HortResearch report (2007) are consistent with the current land application design parameters.

- There may be some errors in the modelling exercise presented by HortResearch (2007) as a result of the seasonal use (i.e. winter use) of selected irrigation areas (acknowledging that each application will be approximately 100 mm).

- The HortResearch report (2007) appears to indicate the application depth will be variable, based on the ability of the soil to receive water but this will not be possible in practice with the proposed application method. This introduces a possible error into the modelling which may have a major impact on the leaching of nutrients. The presence and nature of this error, due to the application method and uniformity of application, should be clarified with HortResearch.

- Wipe-off flows (excess runoff) are not expected as part of normal operation. If this is the case, there will be an uneven distribution of water down the bays (irrigation strips), with the upper reaches receiving considerably more than the lower reaches. This is likely to have an impact on the nutrient modelling undertaken, as the modelling assumes an even application over the entire area.

- The additional leaching as a result of a fixed application depth needs to be further quantified and compared to what was presented in the HortResearch (2007) modelling exercise. If system changes have been made, then new modelling should reflect these changes. This should include the subsequent modelling on the groundwater system and the resulting effect on the Ruamahanga River system.

The application of the modelling results raises a number of issues around the actual application regime proposed. The matters identified are:

- The AEE and HortResearch report (2007) indicate that an application volume of 70 to 150 mm (average of 100 mm) may be used every 7 to 10 days. This is an extremely high volume given the conductivity of some of the soils are reported at 0.5 to 4 mm/hr and brings into question the suitability of border strip irrigation on the heavier soils.

- The proposed loading rate would be significantly less than proposed if the system was designed to maximise nutrient removal.

- It is unrealistic that the heavier soils would be irrigated at all during winter, especially if there is a desire to operate a successful land treatment operation utilising a cut and carry system.

- Compared to the modelled scenarios greater leaching may be experienced than that predicted; which will predominantly apply on the sandy soils.

- The use of clean water conductance rates (e.g. saturated hydraulic conductivity) are not appropriate for the regular and ongoing discharge of effluent, and loading rates should be limited.

- The ability to manage application rates to match soil conditions will not be able to be achieved as is suggested in the AEE as application depths cannot be adjusted in an efficient border strip irrigation system.

- The consequence of year round application on the heavier soils is that the application rate will be too high for the soils to permit drainage (as drainage is essential at the proposed loading rates using border strip). This will potentially lead to the development of anaerobic conditions which will further reduce infiltration rates. Definite controls are required to limit inappropriate irrigation.

The AEE suggests the use of increased application rates, if possible, at some later stage. It is considered that there should be a limit on the application volume and annual application rate until it can be demonstrated that the system can be operated satisfactorily with effects as predicted.

The proposed application regime is dependent on the provision of adequate storage in the ponds which is also dependent on inflows to the plant. The proposed storage volume is 275,000 m^3. If land irrigation is restricted and the river discharge not possible additional storage would be required. Consideration of the application regime in relation to storage is therefore critical to the assessment of the proposal.

(ii) Drainage

As already identified, the soils at the site vary in their suitability for irrigation and in many areas the groundwater levels are close to the surface. The ground conditions suggest that there is an upward hydraulic gradient, confined from above, by the overlying soils. The confining layer and groundwater pressure gradient, along with the proposed high hydraulic loading rate, may result in natural drainage limitations caused by mounding.

Mounding has been modelled by PDP (2008) and shows it may increase water levels between 0.10 and 0.36 m (based on a daily drainage rate of 5.4 mm). The technical report notes that it appears that mounding effects have been based on an average daily application, with an averaged daily contribution to the groundwater system modelled. However in reality, there will be a one-off slug of water entering groundwater on the day of irrigation, with lesser volumes on following days. It is unclear how this would change the mounding predictions and what the consequence would be, especially in terms of soil

health. It is also unclear if a 1 metre separation depth can be maintained to provide for the nutrient attenuation as claimed.

The result of the mounding work, along with the observations noted in the Landcare Research report (2008), suggest that the site has drainage limitations, which occur now in the absence of irrigation. The proposal includes artificial drainage, which will assist, but there will still be limitations to year round irrigation application.

It is also noted that the wipe-off drains in the western area are proposed to run parallel to the proposed groundwater drains. It is possible that they may have similar invert levels resulting in leakage of one to the other. This could mean wipe-off water could enter the drainage system, or drainage water enter the wipe-off system. Further clarification by the applicant is needed on this issue, with particular attention being given to cross contamination and the ability to pump the drainage water back to the ponds.

(iii) Nutrient removal

It has already been noted that the proposed operation should be considered as a land disposal as opposed to a land treatment. This is contrary to the AEE which indicates a desire to optimise land treatment.

The inherent nature of border strip irrigation means that more wastewater is applied than needed to ensure that the lower reaches of the border strip bays receive an application similar to the upper reaches. The excess water is then collected in wipe-off drains. It is considered that the wipe-off drains and the designated infiltration areas will be no more than a rapid infiltration system which will effectively provide for 'disposal' with limited treatment within the soil. Given the role of the wipe-off drains 10% to 50% of the flow could pass directly to groundwater with very minimal land treatment.

The technical report notes that the nutrient loading to the groundwater system, including the quantification of the wipe-off flows (at least the design target flow) needs to be clarified. The resulting impact over the site would then require reassessment, with a nutrient and pathogen mass loading value established which would enable confirmation of the effects of the discharge on the river system. This reassessment should include flows from the rapid infiltration, pond leakage and the effects of the sludge drying operation. The technical report also seeks clarification to identify exactly what the nutrient and pathogen leaching rate from the land irrigation area may be under the current design; in particular leaching as a result of a one-off application of up to 150 mm rather than daily applications of 10 mm. It is also unclear if this issue has been considered in both the HortResearch or PDP modelling, and taken into account when assessing the impact on the Ruamahanga River.

The cumulative effect of nutrient and pathogen leaching from the MWWTP site needs to be considered, including that from the ponds (existing and proposed) and the sludge drying operation. This should be presented as a total mass in addition to a concentration, so that a basic mass balance from the site can be completed.

(iv) Summary

There are a number of issues raised around the modelling, application rates, drainage, and nutrient removal that the applicant may wish to address at the hearing. It is evident that despite a lot of modelling and investigations from well qualified experts there is a degree of uncertainty over the practicalities of the land irrigation operation and therefore the effects on the receiving environment. In having raised the issues this does not mean that border irrigation at the site will be prohibited, rather that special attention to the detailed design and operation of the system will be required.

(v) Monitoring

The applicant has requested that consent conditions imposed allow for flexibility in the operation of the land irrigation. Having consent conditions that are flexible and allow for improved management are considered essential for the ongoing operation of a land application system.

There are a number of technical matters identified above that require clarification. Should quantification and clarification by the applicant be provided, it is possible that a less prescriptive approach could be taken to monitoring. Either way, given the uncertainties it is considered that consent conditions need to be extensive to ensure that the actual and potential effects are adequately addressed.

The impact of the discharge operation on the Ruamahanga River is a critical component of the proposal and assessment. The predicted effects are close to only marginally acceptable, which means that any underestimates on the leaching of nutrients from the land application area could result in a reassessment concluding there is a significant adverse effect on the Ruamahanga River. Consequently an approach is proposed which requires groundwater samples not to exceed a specified target, and if they do, then immediate modification to the land application system is required. This is a pragmatic approach that the technical report considers would avoid a lot of theoretical debate about loading rates and leaching potential, by providing a maximum acceptable nutrient level in the groundwater system. The approach effectively requires monitoring of the bottom line. This approach would also support the monitoring of leakage from the existing ponds, new ponds and landfill.

As the quantification of the mass loading requires further clarification, to provide for constructive advancement of this application a tiered approach to groundwater monitoring is provided in the recommended conditions.

12.4.4 Surface water quality and freshwater ecology

The Ruamahanga River is to become the primary receiving environment for any direct wastewater discharges to water. The Makoura Stream (and the river) will receive stormwater discharges from the land disposal area and are also expected to receive groundwater seepage from the land irrigation area and

new oxidation ponds. Both Makoura Stream and the Ruamahanga River have a strong hydraulic connection with shallow groundwater.

(a) Mixing zones

Before considering the effects on surface water, it is important to determine the point at which the effects of the main wastewater discharge are to be assessed. The discharge outfall point is to be moved from Makoura Stream to approximately 1 km upstream of the stream's confluence with the Ruamahanga River.

The AEE discusses in some length the concepts of reasonable mixing and full mixing. Greater Wellington cannot grant a discharge permit if after reasonable mixing the discharge is likely to give rise to a number of effects (s107(1)(c-g) of the Act).

Modelling by the applicant indicates the discharge will be reasonably (66-70%) mixed 200-400 metres downstream of the outfall and fully mixed by 800 metres downstream (450 metres upstream of Wardell's Bridge). Currently reasonable mixing does not occur until at least Wardell's Bridge.

The applicant is not proposing receiving water quality standards to apply after reasonable mixing, rather they seek to have standards imposed on the wastewater that have been derived to ensure receiving water quality targets are met.

The water quality technical report considers that two mixing zones should be considered: when there is a direct discharge to the river and at times of no direct discharge to the river. This approach is considered necessary given the leaching of nutrients that will occur underneath the land irrigation area ultimately flowing towards the river. There is concern that the nutrient inputs into the river from the ponds and groundwater seepage may be higher than modelling undertaken by the applicant.

During summer when there is a direct discharge, a mixing zone of 200 m is considered appropriate against which to assess the s107 criteria. This approach is recommended as when there is a direct discharge the river will be above median flow and the upstream water clarity, nutrients and bacteria are likely to be close to or above guideline values. During the summer months when there is no direct discharge it is also recommended that a mixing zone is needed to safeguard against unacceptable effects of nutrients leaching into the river via groundwater seepage underneath the land irrigation area and the base of the oxidation ponds. It is recommended that the primary point of compliance is Wardell's Bridge. Dissolved nutrient and periphyton standards should be imposed at this location with monitoring undertaken at this site and several locations upstream during the summer months when there is no direct river discharge. It is noted that the applicant considers that Wardell's Bridge is the most appropriate location to monitor the effects. However, this does not mean that there should be unsightly periphyton growth upstream of the bridge.

(b) Dilution

As part of the discharge regime the applicant suggests a minimum dilution factor should apply. A river/effluent dilution ratio of at least 30:1 at all times is proposed. While it is agreed that minimum dilution factor should be adopted, further explanation by the applicant regarding the rationale for the factor of 30 is required as it may not result in an improvement from the current situation. The technical report notes (paragraph 62) that:

"For example, analysis of instantaneous effluent discharge data for the 2007/08 year indicates that a dilution ratio of more than 30:1 has always been maintained when river flows are above median, with the dilution ratio considerably larger at higher flows (Figure 3). Moreover, based on existing median effluent quality data (Table 3), a 30-fold dilution may be insufficient to reduce dissolved reactive phosphorus concentrations to below recommended guideline values (see paragraph 74)."

The dilution factor required will affect the water clarity achieved as well as the ability to ensure that the dissolved reactive phosphorus receiving water quality guidelines can be met. It may also, in some circumstances during discharges at just above half median river flows, affect the ability of ammoniacal nitrogen toxicity guidelines to be met after reasonable mixing.

(c) Pathogens

To protect bathing waters in New Zealand it is appropriate to use guidelines set in the "Microbiological Water Quality Guidelines for Recreational Areas" (Ministry for the Environment & Ministry of Health 2003). These have a risk based approach for classifying a water body and set a series of trigger levels for managing bathing water.

Maintaining a water body in a state suitable for primary contact recreation is associated with keeping *E. coli* levels below 550 cfu/100ml. Assuming moderate risk, a 95-percentile value of:

- less than 260 cfu/100ml corresponds to 'good';
- less than 550 cfu/100ml corresponds to 'fair'; and
- greater than 550 cfu/100ml corresponds to 'poor'.

However it is noted that that the recreational bathing water guidelines (MfE 2003) are not intended to be used as the basis for establishing resource consent conditions but as a component in the decision-making. The ANZECC guidelines apply to water bodies managed for contact recreation purposes.

The proposed target *E. coli* in the wastewater following the upgrade is 200 cfu/100 mL during summer and 1,000 cfu/100 mL during winter. This is a 60% reduction in *E. coli* during summer, but a 54% increase during winter, compared to the existing summer and winter geometric means. The proposed

upgrade is not predicted to improve any other aspect of the existing wastewater quality, other than possibly ammonia concentrations in the summer.

The river is expected to more frequently comply with the MfE (2003) bathing water microbiological water quality guidelines downstream of the oxidation ponds but when the river flows are high background levels are already elevated. There will be no discharge of pathogens to the river at times when river flows are most conducive to contact recreation.

The AEE notes the presence, downstream of the proposed outfall, of an existing stock water supply intake and a family swimming hole that was not previously affected by the discharge. The applicant states that: "*the water quality will be suitable for irrigation, and the discharge will not be occurring when the hole is likely to be used (i.e., below median flows during summer periods)*." However it should be noted that until the land irrigation system is developed the discharge will actually be occurring above half-median river flow during summer when recreational use may occur.

The existing stock water take is above the confluence of the Ruamahanga River and Makoura Stream. The AEE states (page 206) that options for the water supply are being discussed with the property owner (who lodged a submission in opposition) and will be agreed with them. It is not clear whether any agreement has been reached.

(d) Nutrients and periphyton

Nitrogen and phosphorus are nutrients naturally found in rivers but high concentrations can stimulate the growth of excess periphyton. Below median flows during summer and half-median flows in winter there will be no direct input of nutrients to the river but there will be indirect inputs from seepage through the base of the oxidation ponds and groundwater underneath the land irrigation area.

The wastewater quality and quantity is expected to remain largely unchanged from the current situation. However the key difference is that only a portion of the total contaminant load will be discharged directly to the river. It is important to note that the applicant has sought a considerably higher maximum instantaneous rate of 1,200 L/s compared with the current rate of 700 L/s. This means that when there is a discharge to the river a potentially greater volume and contaminant load would be able to be discharged. For this reason there needs to be some control of nutrient contaminant loads.

The land discharge technical report raises a series of concerns, as already addressed above, that would impact on the nutrient leaching conclusions drawn by the applicant. The surface water quality report picks up on the concerns that nutrient inputs to the river may be higher than modelling predicts.

Modelling undertaken by the applicant shows that when there is a direct discharge dissolved reactive phosphorus (DRP) concentrations will exceed applicant's site specific guideline value (0.030 g/m^3) after both reasonable and full mixing and that the concentration at Wardell's Bridge (for flows above

12.3 m^3/s) is expected to increase 41%, from an existing summer median of 0.071 g/m^3 to 0.100 g/m^3. It has been assumed that the increase reflects the greater instantaneous rate of effluent discharge sought for discharges to the river when flows are above 12.3 m^3/s.

The applicant has stated that conservative modelling suggests indirect inputs of dissolved reactive phosphorus will be negligible ranging from 0.003 g/m^3 at river flows just below median to 0.012 g/m^3 at very low river flows. When the median upstream concentration is taken into account this equates to a total downstream concentration after full mixing in the order of 0.014 g/m^3 during low river flows.

The technical review suggests that adoption of the applicant's site specific DRP limit (0.030 g/m^3) is not as appropriate as deriving a standard in strict accordance with the periphyton biomass model in the national periphyton guidelines (Biggs 2000). Using this model, a standard of 0.012 g/m^3 is recommended.

The applicant's assessment of the effects on periphyton mainly focused on coverage across the river bed not biomass. The technical report (paragraph 77) notes that *"the removal of direct nutrient inputs to the river during low flows is expected to significantly reduce the effects of the existing discharge on river bed periphyton cover and biomass. However, there is considerable uncertainty as to what the indirect nutrient inputs resulting from seepage through the base of the oxidation ponds and groundwater underneath the land irrigation area will be and, therefore, the impacts this may have on instream periphyton biomass."*

The technical report also demonstrates that freshes do not always produce 'flushing flow' conditions, and so disagrees with the applicant's view that discharging wastewater to the river above 12.3 m^3/s in summer will always prevent the stimulation of periphyton growths. In addition, there is evidence of significant periphyton coverage in the Ruamahanga River outside of the summer period, including the occasional guideline exceedance for cyanobacteria mat coverage. This highlights the need to manage nutrient inputs to the river year-round.

Owing to the significant uncertainty around nutrient leaching from the land application area and oxidation ponds to the Ruamahanga River, nutrient monitoring is recommended in the river upstream and downstream of the likely groundwater inputs during summer when there is no direct effluent discharge to the river. Specifically to ensure that significant instream periphyton growths do not occur it is recommended that:

~~a)~~(a) receiving water standards be set for dissolved (soluble) nutrients associated with the promotion of periphyton growth (i.e., dissolved reactive phosphorus and dissolved inorganic nitrogen). The standards would apply over November to April at Wardell's Bridge at times when effluent is not being directly discharged into the river; and

~~b)~~(b) the setting of maximum daily loads for dissolved reactive phosphorus and dissolved inorganic nitrogen in the effluent that would apply year-round when effluent is being discharged into the river.

(e) Invertebrates and fish

At Masterton the high groundwater infiltration rate and low trade waste volumes mean that concentrations of toxicants such as ammonia and heavy metals are relatively low. It can be concluded that the discharge will not result in ANZECC (2000) guidelines for toxicants being exceeded after reasonable mixing. The one possible exception is ammoniacal nitrogen if effluent is discharged at just above half median river flows under the proposed minimum dilution ratio and the river pH is elevated. The establishment of a maximum ammoniacal nitrogen effluent discharge and receiving water standards is therefore recommended.

Given the removal of the direct discharge at low flows the downstream macroinvertebrate community may become healthier. However this will depend on periphyton biomass which in turn is dependent on what effects seepage from the oxidation ponds and land disposal area will have. Monitoring of dissolved nutrients, periphyton and invertebrates is therefore recommended.

(f) Makoura Stream

It is acknowledged that removing the direct discharge from the Makoura Stream will mean that the significant adverse effects currently occurring will cease. It is necessary to consider the effects of the proposal on the Makoura Stream given the strong hydraulic connection with groundwater, the drain to flow into the stream, and the proposed discharge of stormwater from the land disposal area to the stream. All these sources of runoff will affect the water quality and, potentially, ecological health of the stream.

The drain is expected to provide rapid drainage of nutrient-rich groundwater directly to the stream with little or no treatment. The AEE states that the recycle pump station that takes runoff from the wipe-off drains and pumps back to the oxidation ponds will operate during irrigation and for a two hour period after irrigation has ceased. Any runoff after this period the applicant has classified as "stormwater" suitable for direct discharge to a surface water body as it is expected to have low contaminant concentrations. When irrigation is not occurring the wipe-off drains will also collect stormwater and discharge to Makoura Stream or the Ruamahanga River. The applicant states that the level of contamination in this runoff will be negligible.

The PDP (2008) groundwater modelling report considers the likely extent of water quality effects in Makoura Stream as a result of groundwater infiltration and drainage. The predictions are:

~~a)~~(a) Groundwater nutrient concentrations adjacent to Makoura Stream ranging from 0.48 to 2.97 g/m^3 for nitrate nitrogen and from 0.012 to 0.372 g/m^3 for dissolved reactive phosphorus; and

~~b)~~(b) increases in base stream flow of 0.15 m^3/s (resulting in a total flow of 0.32 m^3/s), nitrate nitrogen of 7% (from 3.5 to 3.75 g/m^3 after mixing) and dissolved reactive phosphorus of 50% (from 0.02 to 0.03 g/m^3 after mixing) during summer low flows (for bacteria the increase was predicted to be negligible).

It is considered that the nutrient seepage to Makoura Stream could be higher than predicted given the concerns raised about the land disposal. For this reason it is considered appropriate to monitor water quality, stream flow and aquatic life.

(g) Cumulative effects

The term "effect" includes any cumulative effect which arises over time or in combination with other effects regardless of the scale, intensity, duration, or frequency of the effect. Given this the discharge from MWWTP cannot be seen in isolation from other activities in the catchment. Despite an estimated 60% reduction in direct contaminant load in summer, this discharge will remain the most significant point source discharge to the Ruamahanga River system, which ultimately drains to Lake Onoke.

Submitters expressed a desire to see discharges to surface water removed for a number of reasons including the cumulative effects on the catchment. To achieve this land application would need to be more viable year round or reuse implemented. Greater year round land irrigation would require a reduction in the very high incoming flows and/or additional storage.

(h) Monitoring

The surface water quality technical report contains a series of recommendations about the monitoring and compliance limits that should be undertaken. The key recommendations can be summarised as:

~~a)~~(a) Removal of the direct discharge to the Makoura Stream as soon as possible.

~~b)~~(b) Restrictions on the daily wastewater volume/nutrient load discharged. These have tentatively been set based on current and predicted (2015) average daily dry weather wastewater flows and the current maximum instantaneous discharge rate. As such restrictions may have implications for the viability of the proposed WWTP operation (additional discharge to land and/or storage is likely to be needed), they will need to be discussed at the hearing, with clarification provided from the applicant on the rationale for and intended application of the minimum dilution ratio and maximum instantaneous discharge rate.

~~c)~~(c) Discharge standards based on median and 95th percentile values from recent monitoring results, as well as proposed bacteriological improvements (nominal increases can be built in, which would allow for any changes in wastewater quality that might result from reduced I & I).

~~d)~~(d) Regular monitoring of multiple sites within both the Ruamahanga River and the Makoura Stream. Monitoring of the Makoura Stream is required given its location within the land irrigation area and strong hydraulic connection with groundwater. Provision can be made in the consent conditions to review the frequency of monitoring after two years of the MWWTP upgrade being fully operative if monitoring does not detect any significant difference between upstream and downstream water quality.

~~e)~~(e) Because of the uncertainty surrounding the effects, clear targets need to built into the consent(s) to enable a review of the MWWTP operation and/or consents, should adverse effects arise.

~~f)~~(f) Conditions will be required to address the discharge to Makoura Stream and the Ruamahanga River at low (above half median) flows while the new oxidation ponds and land irrigation area are under construction.

~~g)~~(g) Preparation of a detailed Operations and Management Manual for the entire MWWTP operation.

~~h)~~(h) Regular (monthly) reporting of monitoring results, together with a comprehensive annual monitoring report summarising compliance with all resource consent conditions.

12.4.5 Hazard management

The applicant has sought consent to upgrade and maintain the existing stopbank, adjacent to the Ruamahanga River, directly to the north of the wastewater treatment plant oxidation ponds to provide 100 year flood protection. Consent is also required for the diversion of floodwaters by the stopbanks.

An existing stopbank provides flood protection to land on the true right of the river, from Masterton down to the MWWTP. The stopbank was re-located further back from the river channel from its original position, because bank retreat from river erosion removed or threatened lengths of the stopbank. The height of the stopbank was also increased in 1999. Recent hydraulic modelling has shown the existing stopbank protection for the MWWTP does not meet the required standard for a 1 in 100 year event therefore presenting a flood risk to the MWWTP in medium to large flood events. There is no stopbank on the true left side of the river, and low-lying land around the Whangaehu confluence and elsewhere on the Te Ore Ore plains is prone to flooding.

The applicant's proposal is as follows (as shown on drawing C602 of the AEE):

- Along the section where the oxidation ponds are to be decommissioned to lower most of the existing pond embankments to the 2-year flood level to allow floodwater to spread over the area of the decommissioned ponds and plant a 60 metre wide willow buffer area.

- To the north of existing Pond 1 remove an approximate 315m length of stopbank and build a new stopbank on a different alignment (closer to the ponds).

- Along new primary pond 1A raise the existing stopbank over an approximate 325m length.

- 'Enhance' existing willow tree buffer along where the existing stopbanks are.

Consideration of the flood risk is important as the applicant proposes to use the area between primary pond 1A and the river for land disposal as well as the area of the existing ponds. Submitters are concerned that the land to be irrigated is unsuitable as it is prone to flooding and erosion.

Overall, with the removal of the existing pond system the flood plain at the southern end of the site will be widened and of a more consistent width to the existing floodplain upstream of the existing ponds. This will relieve existing pressure during flood events at the southern end of the site. A number of submissions in the original 2007 application raised concerns regarding the stopbank proposal. As there are no submissions raising such concerns with the 2008 application, it is reasonably assumed that the community's expectations around flood hazard management at the site have been met.

Greater Wellington's Flood Protection Department have reviewed the revised 2008 application and are satisfied that the proposed stopbank upgrade is consistent with their aims and objectives for the Upper Ruamahanga River scheme.

12.4.6 Air quality

Odours associated with wastewater treatment occur as a result of anaerobic decomposition of wastewater. This process generates a variety of volatile organic compounds that commonly include sulphides (rotten egg smell), complex amine and heterocyclic nitrogen-containing compounds and skatole-type aliphatic compounds (faecal odours). These compounds have low odour thresholds and are generally perceived to be offensive and/or objectionable odours.

The potential sources of these odours from the proposal are:

- the new oxidation ponds;

- desludging the oxidation ponds to be decommissioned; and

- irrigation to the boarder strip area.

Odour is not a problem for well run plants under normal operating conditions. The applicant states that historically the existing ponds have not generated odours that have resulted in complaints. Greater Wellington's records of occasional complaints about what could be seen as unusual events but there is

no history of ongoing complaints. With new ponds proposed, sludge levels in the ponds will be low for some time therefore reducing the potential for odours.

Consent has been sought to desludge and decommission the existing oxidation ponds. It is proposed that the sludge be air dried in-situ until the moisture content is the consistency of dry soil (approximately 50% solids) at which point it will be relocated to a 'storage landfill' within the decommissioned ponds. The proposed landfill area is shown on Plan C602 in Appendix C of the AEE. While the applicant states that three to four months over summer will be sufficient drying time they have sought the consents to allow for two summer seasons is case of high rainfall events.

Odour from drying sludge can be an issue. To reduce the odour potential the applicant proposes to dry the sludge over summer and ensure that the sludge has had time to stabilise. As the nearest dwelling is over 500 metres away from the ponds it is not expected that odours from desludging will cause any adverse effects on neighbouring property owners as the applicant states odour will not be noticeable beyond 50 metres from a pond.

There is potential for odour from irrigation practices. The use of border strip irrigation, as opposed to spray irrigation, will reduce the potential for odours. The applicant has adopted a number of measures as part of the proposed design that will reduce the potential for nuisance odours. The measures include:

- the provision of buffer areas around the land to be irrigated;
- piping the wastewater to each boarder strip as opposed to being conveyed in an open channel;
- known areas of existing ponding will be treated with slit drains, if needed, during construction;
- the provision of wipe off drains to collect excess runoff so that ponding does not occur; and
- implementation of an odour management plan.

Submissions were received from residents in the Pokohiwi Road area requesting that the use of Pt Lots 1 & 2 DP 9928 and Pt 1 AP 2698 are removed from the proposal given the close proximity to neighbours. It is noted that these sections of land are to form part of the buffer area at the northern most extent of the site and are not proposed for irrigation use. It is considered appropriate that this area is part of an extended buffer given the proximity of neighbouring dwellings.

Some submitters seek increased buffer areas and that planting commences as soon as possible. No irrigation is to occur within the buffer area or 50m of any private property boundary with the exception of buried drip line irrigation of wastewater to water plantings. The extent of planting within the buffer area will vary as a number of neighbours have expressed a preference for views of open space.

With the measures proposed by the applicant, and assuming the system is well managed it is not considered that the buffer areas need to be increased and there should not be objectionable odour beyond the boundary of the site.

12.4.7 Construction matters

(i) Earthworks

The proposal requires a significant volume of earthworks to be undertaken. Earthworks include:

- construction of the new oxidation ponds,
- development of the irrigation areas (net area 75 hectares),
- filling in of the existing oxidation ponds to form an irrigation area (22 hectares), and
- works along the banks and bed of the Ruamahanga River and Makoura Stream.

The applicant states that the new ponds can be constructed in one season and the irrigation areas are to be constructed in the summer season.

If unmanaged a large amount of sediment from these earthworks would transfer into waterways both during and after construction, potentially affecting water quality and impacting on instream values, including aquatic fauna.

Greater Wellington has produced guidelines for earthworks activities (Erosion and Sediment Control Guidelines for the Wellington Region, September 2002). The applicant proposes to manage earthwork activities through an Erosion and Sediment Control Plan (ESCP) and has sought consent to discharge sediment laden stormwater to the Ruamahanga River and Makoura Stream arising from bulk earthworks operations during construction activities. The proposed ESCP is to be a subset of a Construction Management Plan (CMP).

It is agreed that the effects caused by earthworks can be mitigated by standard management and contractual procedures however ongoing monitoring, and in some cases daily monitoring, of erosion and sediment control devices may be necessary.

Earthworks can also cause dust problems. The applicant has proposed a number of standard mitigation measures such as:

- regular watering,
- taking care as to where stockpiles are located,
- progressive remediation,
- reducing the area exposed, and

- restricting traffic speeds within the site.

It is considered that these measures are appropriate to adequately control potential effects from dust.

(ii) Dewatering

Resource consent has been sought to discharge treated wastewater and groundwater arising from dewatering during the construction process at various locations. The locations include a cut off trench to the north of Pond 1A and from drainage trenches constructed in the existing ponds when they are drained for sludge removal. Ancillary to this is the need to take and divert groundwater arising from dewatering.

Groundwater inflows into the existing ponds and any inflow should a significant flood event occur will be directed to sumps in low lying areas of the ponds and discharged via pump(s) to the Makoura Stream. The AEE states that discharge rates of up to 500 L/s may be required and that the groundwater quality discharged will be of a similar or better quality than the existing pond effluent. There is no other information provided in the application regarding the dewatering, for example, the likely daily maximum volume and the frequency and duration of a discharge. The existing consent authorises the discharge from the oxidation ponds of up to 700 L/s with maximum daily total no more than 35,000 m^3 which equates to a continuous rate of 233 L/s.

There are limited hydrological records for the Makoura Stream. Spot flow measurements indicate that the typical low flow is around 0.12-0.15 m^3/s immediately upstream of the MWWTP discharge. A discharge of up to 500 L/s is therefore considered a significant rate. In the absence of information it has been difficult to formulate recommended conditions. However as a minimum it is recommended that a dewatering plan should be prepared.

(iii) Makoura Stream diversion

In order that the new ponds can be constructed, the applicant has applied to divert an approximate 500 metre section of the Makoura Stream around the western edge of the new ponds. Once complete, proposed oxidation ponds 3-5 would be constructed in the area where the stream currently flows.

While it is not ideal to divert such a large section of the stream, the applicant has proposed a series of mitigation measures including:

- replicating the natural stream channel and habitat,
- riparian planting,
- and preparation of an environmental management plan.

The RFP identifies the Makoura Stream as requiring enhancement for habitat purposes therefore the applicant's proposal should help achieve this objective.

I agreed that any effects on natural character and amenity will be temporary and the restoration work will result in long-term benefits.

(iv) Outfall diffuser

A new outfall diffuser is proposed on the true right bank of the river at a location approximately mid length of the existing secondary oxidation pond. The diffuser will extend out into the riverbed with rock protection around the outlets. Construction of the diffuser is proposed to be carried out in flowing water (i.e. no temporary diversion), take up to one month to complete and avoid spawning. The AEE identifies the trout spawning period as 1 June to 30 August whereas the Fish and Game submission identifies the period May until October. The Department of Conservation submission notes that the migration period for native fish is 1 September to 30 November and instream works should be avoided over this period. Clarification of the proposed exclusion time period is required. Given the works will be carried out in flowing water it can be expected that there will be some sedimentation and visual discolouration of the river however the effects are considered temporary and minor in nature.

(v) Timing of works

The applicant states that the upgrade works may not be completed until mid 2015. From information in the AEE an interpretation of the proposed works required and possible timing is:

Phase of work	Timing
Detailed design and tender let	2009
Preparation of site, diversion of Makoura Stream and construction of new inlet works	commence mid 2010
Earthworks for new pond, earthworks for irrigation scheme	2010/11 summer
New ponds commissioned	mid 2011
Irrigation scheme commissioned	Spring 2011
Sludge drying and landfilling finished	2011/12 summer Contingency 2012/13 summer
Existing pond area returned to pasture followed by use as an irrigation area when pasture suitable	2012/13 summer Contingency 2013/14 summer

It is not clear when the discharge from the Makoura Stream will be removed and the new outfall used. There is no reason why this could not happen at an earlier stage to address the current adverse effects on Makoura Stream.

It is considered appropriate that regular reporting on progress of the upgrade be provided to Greater Wellington. A condition has been recommended to this effect.

12.4.8 People and communities

Masterton requires an efficient, economic, and sustainable means of wastewater disposal to provide for the health, well being and safety of the residents. In this respect the use of existing infrastructure, combined with a treatment upgrade, can often be considered as the most effective mechanism to achieve this.

Although local residents can be directly affected by the discharge, it is recognised that affordability is also an important consideration in assessing the upgrade options for Masterton. As part of considering the upgrade options the applicant undertook an affordability assessment of the four main options. The analysis supported the applicant's preferred scheme (i.e. this application) however, it was acknowledged that it was the highest cost of the four options.

12.4.9 Summary of effects

The existing wastewater discharge is having significant adverse effects on Makoura Stream. These effects will continue until the changes are made to the discharge regime. These applications will therefore need to authorise the existing discharge in the short term.

The changes to the discharge regime will mean that those existing effects will be reduced significantly, and the Ruamahanga River will be suitable for contact recreation at Wardell's Bridge. However, a number of matters identified in the assessment above need to be addressed by the applicant to ensure that the combined effects from leakage from the ponds, the sludge landfilling operation, land application of wastewater, and the discharge to the Ruamahanga River will meet the receiving environment standards required.

The effects on air quality from the operation of the MWWTP are considered to be adequately avoided, remedied or mitigated by the measures proposed by the applicant.

The majority of the effects arising from construction activities could be managed by standard construction practices. However it is unclear how the dewatering aspects of the proposal will be managed.

13. Statutory evaluation

The purpose of the statutory evaluation is to provide an assessment of the application against the relevant statutory provisions in the Act. The section is structured such that national, regional, and then other relevant matters are discussed, concluding with an analysis of Part II of the RMA. Any objectives and policies summarised in this section are presented in full in Appendix 4.

The Government has announced a proposed National Policy Statement (NPS) for Freshwater Management. Councils are required to give effect to NPS through regional policy statements, regional plans and district plans, as well as when considering resource consent applications. Currently the NPS is in draft

form with formal submissions having only closed on 23 January 2009. The NPS does not come into affect until it is gazetted.

The National Environment Standard for Air Quality is not considered relevant to these applications.

13.1 Regional Policy Statement for the Wellington Region (RPS)

The RPS (operative May 1995) outlines the resource management issues of significance to the region and provides a framework for managing the natural and physical resources of the region in a sustainable way. The objectives, polices and methods relevant to this application are listed in full in Appendix 4 to this report. Greater Wellington, in exercising its functions and powers, needs to have regard to the following provisions of the RPS:

13.1.1 Chapter 4 – The Iwi Environmental Management System

Chapter 4 provides a general statement of the objectives, policies and methods that have been developed to meet iwi resource management aspirations in the Region. They are derived in accordance with the principle of Tiakina te Mauri Ora (the protection of "Mauri"). Of particular relevance to this application are:

- Objectives 2 and 3;
- Policies 4 and 6;
- Method 4.

Objective 2 calls for the principles of the Treaty of Waitangi to be taken into account in resource management; this is also a requirement under section 8 of the Act, and is discussed in section 13.5.3 of this report.

Objective 3 seeks increased opportunities for tangata whenua to exercise kaitiakitanga in the Region. Its intent is reflected in Policy 6, which recognises and promotes the role and importance of kaitiakitanga. Policy 4 recognises and provides for the relationship of Māori and their culture and traditions with their ancestral lands, water, waahi tapu and other taonga.

Method 4 states the mechanisms that Greater Wellington will use (where appropriate), to take tangata whenua values into account in the resource consent granting process. These include consulting tangata whenua on consent applications; encouraging applicants to consult with tangata whenua and appointing Māori as hearings commissioners.

The applicant has undertaken consultation with tangata whenua (Rangitaane o Wairarapa and Kahungunu ki Wairarapa). Greater Wellington also directly notified these iwi groups of the application. Submissions have been received by both Rangitaane o Wairarapa and Kahungunu ki Wairarapa who oppose the discharge of wastewater to water on cultural grounds.

While consultation has occurred, Rangitaane o Wairarapa believe that there has not been genuine consideration to some matters and therefore whilst being

involved in a consultation process, Rangitaane believe they have had a limited role in influencing desired outcomes. They are opposed to wastewater discharges to water as river systems are the blood veins of Paptuanuku which give and sustain all life. All options presented to iwi have involved some wastewater discharge to water, hence their concern that no consideration of `real alternatives' have been considered.

The application has taken into consideration the desire of iwi, and the community, for land disposal however it is clear from the land disposal technical report that full time land disposal would not be possible given the current proposal.

13.1.2 Chapter 5 – Fresh Water

Chapter 5 contains the issues, objectives, policies and methods, which address the management of region's fresh water resources. Fresh water includes surface water (lakes, rivers, streams, swamps, wetlands, etc) and groundwater (aquifers, underground streams etc). Of particular relevance to this application are:

- Issues 1 and 2;
- Objective 2;
- Policies 1, 4, 5, 6, 9,10, 12, and 13.

Issue 1 highlights the Makoura Stream and lower Ruamahanga River as freshwater bodies having impaired water quality.

Objective 2 states that fresh water should be of sufficient quality to allow for the uses and values for which it is required; to safeguard its life-supporting capacity; and to meet the reasonable foreseeable needs of future generations. Policies 4 and 6 are in direct support of this objective.

Policies 1 and 4 states fresh water quantity and quality should be maintained and protected to meet the requirements listed in Objective 2, and that any adverse effects on aquatic and riparian ecosystems are avoided, remedied or mitigated. Policy 5 goes further stating to improve water quality and restore contaminated water to a standard which is appropriate for its desired uses and natural values.

Policy 6 relates to the control of point source discharges (for example from outfall pipes), and their effect on fresh water quality.

Policy 9 relates to avoiding, remedying, or mitigating adverse effects on modification to river beds.

Policy 10 requires the managing of water quality in water bodies of regional significance for heritage, recreational, or other amenity values, which included the Mid-Ruamahanga River for recreation and angling.

Policy 12 requires that any adverse effects on natural character of fresh water bodies are avoided, mitigated or remedied.

Policy 13 recognises the cultural relationship of tangata whenua with fresh water bodies and promotes protection of sites of significance to iwi.

The potential adverse effects of the proposal on freshwater quality and ecosystems are discussed in sections 12.4.4 and 12.4.7 of this report. The assessments conclude that adverse effects may occur, but that these effects can be mitigated or remedied provided that the consent holder complies with the recommended conditions of consent.

13.1.3 Chapter 6 – Soils and Minerals

Chapter 6 contains issues, objectives, policies, and methods relating to the region's soils and minerals. Of particular relevance to this application are:

- Objective 1 - requires soils maintain desirable physical, chemical, and biological characteristics to retain life supporting capacity;

- Policy 6 - requires the disposal of waste in ways which respect the assimilative capacity of the soil and to avoid, remedy, and mitigate any adverse effects.

There is a high degree of uncertainty over the land irrigation operation and therefore the effects on the receiving environment given the concerns raised about the modelling, application rates, and suitability of the soils. However these can be addressed through the detailed design and the strict operation of the system that will be required. A comprehensive set of conditions are proposed to ensure that adverse effects will be avoided, remedied or mitigated.

13.1.4 Chapter 8 – Air

Chapter 8 contains issues, objectives, policies and methods, which address air quality issues in the Region. Of particular relevance to this application are:

- Objectives 1 and 3;

- Policies 6, 8, 11, and 12.

Objective 1 recognises that there is a public desire for high quality air whilst acknowledging that there may be circumstances when minor deterioration of quality is acceptable. Objective 3 states that the adverse effects arising from discharging contaminants to air should be avoided, remedied or mitigated.

Policy 6 advocates the use of improved control technology to avoid or minimise the discharge of contaminants to air at source, whilst policies 8, 11, and 12 indicate that the adverse effects of air pollution and odours on human health and public amenity values should be avoided, remedied or mitigated.

Section 12.4.6 has considered the potential sources of odour and concludes that with the measures proposed by the applicant, and assuming the system is well

managed there should not be objectionable odour beyond the boundary of the site. It has been recommended that the applicant be required to prepare an odour management plan for the site and maintain a complaints register.

13.1.5 Chapter 9 - Ecosystems

Chapter 9 contains issues, objectives, policies and methods that seek to protect the many different types of ecosystems in the Wellington Region. Of particular relevance to this application are:

- Objective 2;
- Policy 4.

Objective 2 expresses the desire that healthy, functioning ecosystems are distributed throughout the Region.

Policy 4 requires that the adverse effects of activities on ecosystems are avoided, remedied or mitigated. Effects listed in the policy as being of particular concern include prevention of the natural processes of an ecosystem (including nutrient cycles), and a reduction in the quality of non-living parts of an ecosystem (such as water).

The effects on surface water, groundwater and soils have been considered in sections 12.4.3 and 12.4.4. A comprehensive set of conditions are proposed to ensure that the effects are addressed and that appropriate monitoring is undertaken.

13.1.6 Chapter 13 - Waste Management & Hazardous Substances

Chapter 13 contains issues, objectives, policies and methods on waste management and hazardous substances in the region. Of particular relevance to this application are:

- Issue 6;
- Objectives 1 and 2;
- Policy 10.

Issue 6 highlights that wastewater discharges is of general concern and of particular concern to Maori.

Objectives 1 and 2 aim to reduce the volume of waste generated and minimised through reuse, recycling, and resource recovery.

Policy 10 states that in all decisions on wastewater discharges, that wastewater is treated to a level appropriate to ensure adverse effects on human health and quality of ecosystems is avoided, remedied, or mitigated; and that the values and views of iwi are given due recognition and the values and views of communities of interest are taken into account.

There are two aspects to waste management: the wastewater and the sludge disposal. The effects on the environment from the wastewater discharge have been based on the inflow to the MWWTP essentially remaining the same as it is currently. The AEE notes the commitment Masterton District Council has made to infiltration and inflow rates. Should this work result in a significant reduction in the inflows to the plant the concentration of the influent would increase potentially changing the nature of the discharge.

The proposal goes some way to reusing the wastewater by adopting part time land disposal. The future landfilling of the new oxidation pond sludge is not considered appropriate. There is no information about the likely characteristics of the sludge and that in 30 years time it would be expected that biosolids are reused.

13.1.7 Chapter 14 - The Built Environment and Transportation

Chapter 14 contains issues, objectives, policies and methods that seek to provide guidance on the use and development of the built environment in the region. This chapter considers the buildings, structures and facilities; infrastructure; natural systems; resources and waste production; and the process of development and urban form. Of particular relevance to this application are:

- Policies 5 and 6.

Policy 5 recognises that the services provided by infrastructure provide an important contribution of the social and economic well-being of the Region.

Policy 6 promotes the efficient use of infrastructure in the Region, and the reduction of adverse effects resulting from this use.

The proposal utilises the existing infrastructure and provides an essential service to the Masterton community by providing a means of treating and disposing of the town's wastewater. Masterton requires an efficient, economic, and sustainable means of wastewater disposal to provide for the health, well being and safety of the residents.

13.2 Regional Freshwater Plan (RFP)

The RFP addresses the values identified in Part 2 of the Act, the management of flooding, activities relating to the use of river beds, use of freshwater and the discharge of contaminants to freshwater (except those that are discharges to land that then enter water) . It applies throughout the Wellington Region on the landward side of the coastal marine area.

To some extent the relevant policies have already been discussed in section 12.4.4 of this report, which assesses the potential adverse effects of the discharges to the Ruamahanga River and Makoura Stream. There are a number of other objectives and policies that have some relevance to the proposal, but for the purpose of this assessment, attention has been given to the most relevant objectives and policies. It has already been noted that the existing discharge

will continue to have adverse effects on Makoura Stream until no later than mid 2015 when the proposed works will be completed.

13.2.1 General objectives and policies

Objective 4.1.2 requires the mauri of water bodies and stream beds to be protected. This objective is supported by policies 4.2.1-4.2.8, which relate to the relationship of tangata whenua with freshwater.

Tangata whenua consider that the discharge of treated or untreated human waste to freshwater is culturally inappropriate as it has an adverse effect on the mauri of freshwater. Therefore the part-time discharge to surface water is contrary to objective 4.1.2 of the RFP. This is not an effect that can be easily remedied or mitigated.

Objective 4.1.11 states that communities should be able to use freshwater resources to provide for their social, economic, and cultural well being and for their health and safety, whilst objective 4.1.12 requires that the adverse effects of any such use are avoided, remedied or mitigated.

The treatment and disposal of wastewater is an essential community service that does provide social and health benefits to the people of Masterton. However the use of the river as a receiving water for this wastewater will have adverse effects. In accordance with objective 4.1.17 of the RFP, I have recommended conditions of consent that attempt to avoid, remedy or mitigate these adverse effects.

Policies 4.2.9 and 4.2.11 outline various natural values including natural character, aquatic habitats and freshwater ecosystems, which need to be considered when assessing this proposal. The technical review on surface water quality showed that there is potential for adverse effects on these natural values, which can be avoided, remedied, and mitigated with consent conditions, particularly discharge and receiving water quality conditions.

Policies 4.2.15 requires that any adverse on effects regional important water bodies (including the Ruamahanga River) are avoided, remedied, or mitigated and policy 4.2.16 ensures that there is no reduction in the quality of lawful public access. A condition is proposed to ensure that the change of discharge location does not result in a reduction of access to stock water for a neighbouring property, whilst the proposed discharge regime does go some way towards avoiding effects on recreational users.

Policy 4.2.23 requires the benefits resulting from any proposal for the use of a waterbody to be taken into account when assessing the proposal. As discussed above the treatment and disposal of wastewater is of benefit to the Masterton community.

13.2.2 Water quality and discharges to fresh water

Policy 5.2.4 states that the lower and mid Ruamanganga River is to be managed for contact recreation purposes. The proposal will result in a 60% reduction in *E. coli* during summer (target 200/100mL) when compared to the

existing summer geomean *E. coli* (485 /100mL) count. There will be no discharge of pathogens to the river at times when river flows are most conducive to contact recreation. Therefore the river is expected to more frequently comply with the MfE (2003) bathing water microbiological water quality guidelines downstream of the oxidation ponds.

Policy 5.2.7 states that all groundwater in the Wellington Region is to be managed so that there are no net adverse affects on its quality as a result of discharges to surface water or groundwater (subject to Policy 5.2.10).

Policy 5.2.9 requires water quality to be enhanced for particular purposes in certain watercourses including the Ruamahanga River and Makoura Stream (for contact recreation purposes). This has been discussed in detail in the technical review and subject to the recommended consent conditions (setting effluent and receiving environment standards) this policy is satisfied.

Policy 5.2.10 allows the discharge of contaminants to freshwater, where they do not satisfy policies 5.2.1 to 5.2.9 subject to meeting one of five criteria:

~~(1)~~(1) the discharge is of a temporary nature; or

~~(2)~~(2) the discharge is associated with necessary temporary maintenance works; or

~~(3)~~(3) exceptional circumstances justify the granting of the permit; or

~~(4)~~(4) the discharge was present at the time that Plan was notified and is not likely to cause a decrease in existing water quality and a programme of works is defined over a set time period; or

~~(5)~~(5) it is consistent with the purpose of the Act.

The policy essentially permits the existing discharge until the upgrade is complete as it is temporary and upgrade works are proposed. There is some uncertainty raised in the technical report about the likely effects given the concerns raised about the modelling. However comprehensive conditions are proposed to ensure that there are no unacceptable effects on groundwater quality.

Where a mixing zone is proposed policy 5.2.11 seeks to ensure that the zone is determined after taking into consideration a number of factors. The conditions recommended have allowed for a mixing zone.

Of particular relevance to this proposal is policy 5.2.12 where discharges directly to fresh water that do not pass through land or an artificial wetland are only allowed where:

- it better meets the purpose of the Act than disposal to land; and
- there has been consultation with the tangata whenua in accordance with tikanga Maori and due weight has been given to sections 6, 7, and 8 of the Act; and

- there has been consultation with the community generally.

The explanation to the policy notes that *a discharge of sewage to fresh water would better meet the purpose of the Act than a land discharge if the effects of the discharge to fresh water were significantly less than those of a land discharge. Adverse effects include effects on mauri and the values of both the tangata whenua and the community at large.*

The continued discharge of human waste to the Ruamahanga River is culturally offensive to Māori. A number of submissions received also seek that there be no discharge to surface waters. The proposal does go some way to reducing discharges to surface water by only discharge to the river at times of higher flows.

It is acknowledged that the applicant has undertaken consultation with tangata whenua and the wider community however it is clear from the land disposal technical report that full time land disposal would not be possible given the current proposal. On balance, the proposal therefore better meets the purpose of the Act than full time land disposal.

13.2.3 Water quantity and the taking, use, damming, or diversion of fresh water

Policy 6.2.14 provides for minor diversions of water. The dewatering of the site is within the scope of this policy. Policy 6.2.15 allows for diversion of a watercourse provided adverse effects are avoided, remedied, or mitigated. The proposal to divert the Makoura Stream subject to recommended consent conditions is consistent with this policy.

13.2.4 Use of beds of rivers

Policy 7.2.1 allows for various uses within river beds including structures for network utility purposes. Policy 7.2.10 ensures that any structures are safe and visual amenity is minimised. The new outfall diffuser and erosion works meet the intent of these policies.

13.3 Regional Plan for Discharges to Land (RPDL)

The RPDL addresses discharges to land irrespective of the source of the discharge. It applies throughout the Wellington Region on the landward side of the coastal marine area. The RPDL identifies that the Ruamahanga River is vulnerable to groundwater contamination and that while agricultural activities are contributing to excessive nutrient levels in the Ruamahanga the MWWTP also contributions significantly.

Objective 4.1.4 seeks a significant reduction in contamination of surface water and groundwater from discharges of human effluent to land. Objective 4.1.5 seeks that the adverse environmental effects of discharges of liquid contaminants from point sources into or onto land are avoided, remedied or mitigated. Policies 4.2.12 – 4.2.18 provide guidance to achieve the objectives. Of particular relevance are policies 4.2.12 and 4.2.13.

Policy 4.2.12 requires consideration to any relevant iwi management plans or statements of tangata whenua views when considering applications for the discharge of human effluent (treated or untreated) to land. The views of tangata whenua are discussed in the AEE and expressed through the submissions received from Rangitaane o Wairarapa and Kahungunu ki Wairarapa.

The application has taken into consideration the desire of iwi, and the community, for land disposal however it is clear from the land disposal technical report that full time land disposal would not be possible given the current proposal.

Policy 4.2.13 sets out 10 matters than particular regard be had to when assessing applications for the discharge of contaminants to land from reticulated sewerage systems. These matters have been considered in section 12.4.

13.4 Regional Air Quality Management Plan (RAQMP)

The RAQMP addresses activities relating to discharges to air under subsections 15(1)(c) and 15(2) of the Act. It applies throughout the Wellington Region on the landward side of the coastal marine area.

The relevant objectives are 4.1.1 and 4.1.2 and policies 4.2.4, 4.2.5 to 4.2.7 and 4.2.12. In summary, the objectives and policies seek to ensure that effects are adequately avoided, remedied or mitigated such that high air quality is maintained and degraded air quality is enhanced. I agree with the applicant that with good management practices the proposal will be consistent with policy.

13.5 Part 2 - Resource Management Act 1991

Consideration of an application under section 104 of the Act is subject to Part 2. "Subject to" gives primacy to Part 2 and is an indication that it is an overriding guide when construing the provisions of the Act.

Part 2 (section 5) of the Act defines the purpose of the Act. Sections 6, 7 and 8 of Part 2 define the matters a consent authority shall consider when achieving this purpose.

13.5.1 Section 6 - Matters of National Importance

In exercising its powers and functions under the Act, Greater Wellington is required to recognise and provide for the matters of national importance listed in Section 6 of the Act. I have identified the following matters to be of particular relevance to this application and have addressed the effects of the proposal on that basis.

Section 6(a) provides for the preservation of the natural character of the rivers and their margins, and the protection of them from inappropriate use and development.

There are physical works proposed in and along the banks of the Makoura Stream and the Ruamahanga River. The Makoura Stream realignment works will result in improved habitat, including riparian values. The works to construct and maintain the outfall structure are temporary in nature and the pipe will be placed below the scour depth of the river. The discharges do have the potential to cause adverse effects on natural character. However these effects can be appropriately mitigated, with the exception of lack of information about the dewatering discharge, by the recommended conditions of consent included in section 0 of this report.

Section 6(e) provides for the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.

Submissions received from Māori are clear in their opposition to wastewater discharges to water. The application has taken into consideration their desire for land disposal however it is clear from the land disposal technical report that full time land disposal would not be possible given the current proposal.

13.5.2 Section 7 - Other Matters

The other matters to which a consent authority must have particular regard in relation to managing the use, development and protection of natural and physical resources are listed in Section 7 of the Act. In contrast to section 6, the matters set out in section 7 are not declared to be matters of national importance.

Section 12 of this report (assessment of effects) specifically addresses the relationship of the proposed upgrade and continued operation of the MWWTP and its associated discharges to a number of these matters, namely:

- **Section 7 (a)** Kaitiakitanga
- **Section 7(aa)** The ethic of stewardship
- **Section 7(b)** The efficient use and development of natural and physical resources
- **Section 7(c)** The maintenance and enhancement of amenity values:
- **Section 7(d)** Intrinsic values of ecosystems
- **Section 7(f)** The maintenance and enhancement of the quality of the environment
- **Section 7(g)** Finite characteristics of natural and physical resources
- **Section 7(h)** The protection of habitat of trout and salmon
- **Section 7(i)** The effects of climate change

Regarding (a) and (aa), kaitiakitanga and the ethic of stewardship have been recognised and provided for. Consultation has occurred prior to the applications being lodged and direct notification of the application occurred.

Section 7(b) requires consideration of whether a proposal is an efficient use and development of natural and physical resources. Section 7(b) does not require consideration of the use or development of other resources that might have been used instead. A proposal may provide an efficient use of a resource, noting that the Makoura Stream, the Ruamahanga River, the groundwater and the soils are all natural resources, if it enables people to provide for their social and economic well being but only to the extent that it:

- does not impair the social well being and health of other people and the community;
- avoids, remedies, or mitigates adverse effects on the environment; and
- maintains and enhances amenity values and the quality of the environment.

These matters have already been addressed. In terms of the use and development of physical resources, the existing MWWTP is an existing resource.

The Act defines amenity values as '*…those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes*.'

The amenity values (section 7(c)) of the Ruamahanga River will be improved as the river is expected to more frequently comply with the MfE (2003) bathing water microbiological water quality guidelines downstream of the oxidation ponds There will be no discharge of pathogens to the river at times when river flows are most conducive to contact recreation.

In terms of sections 7(d), (f), (g) and (h) the conditions recommended will ensure that that are not significant effects on ecosystems.

The effects of climate change relate to the potential for greater rainfall and/or more extreme weather events that could mean greater rainfall intensities. Increased rainfall could result in greater infiltration and inflows from stormwater. The Ministry for the Environment updated in July 2008 their publication "Preparing for climate change: a guide for local government in New Zealand". It is unlikely that the effects of climate change would be noticed over the term of this consent.

13.5.3 Section 8 - Principles of the Treaty of Waitangi

In considering the application, the Council is required to take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) with all other matters. The Waitangi Tribunal and Courts continue to establish the principles of the Treaty of Waitangi and it is recognised that the principles are continuing to evolve. Two key principles that are of relevance to this application are

active protection and partnership. This includes a duty to act in good faith and to make informed decisions through consultation.

The applicant has undertaken consultation with tangata whenua. Greater Wellington also directly notified iwi of the application. Submissions have been received by both Rangitaane o Wairarapa and Kahungunu ki Wairarapa. The applicant has undertaken consultation with tangata whenua regarding their proposal and I am satisfied that the consultation process undertaken has demonstrated all the requirements for consultation established by the Courts.

13.5.4 Section 5 - Purpose

The purpose of the Act is to promote the sustainable management of natural and physical resources. Sustainable management means managing the use, development and protection of natural and physical resources in a way which enables people and communities to provide for their needs whilst sustaining the potential of these resources to meet the needs of future generations; safeguarding the life-supporting capacity of air, water, soil and ecosystems; and avoiding, remedying or mitigating any adverse effects of activities on the environment.

The method of applying section 5 involves an overall broad judgement of whether a proposal would promote the sustainable management of natural and physical resources. This recognises that the Act has a single purpose. Such an approach allows for the comparison of conflicting considerations, the scale or degree of them, and also their relative significance or proportion in the final outcome.

The provision of a wastewater treatment solution for the community has taken a number of years to get to this stage and the proposed upgrade will take a number of years to implement. Wastewater systems are critical community infrastructure for communities to be able to provide for their health and safety. The assessment considers that the proposed change will contribute towards providing for the health of river users as there will be no discharge of pathogens to the river at times when river flows are most conducive to contact recreation.

This assessment has identified that the proposal does have the potential to cause adverse environmental effects and there are a number of areas where clarification is required. Section 12.4.1 summarises the six key conclusions reached in the assessment being:

- there is a high degree of uncertainty over the land irrigation operation and therefore the effects on the receiving environment;

- robust monitoring of the land application system is essential to assess the performance of the site and flag any issues that may arise which could limit the sustainability of the operation;

- the proposed upgrades are only predicted to improve wastewater quality by reducing bacteria levels during summer and may result in a poorer quality discharge during winter;

- the dissolved reactive phosphorus receiving water quality guidelines may not always be met;

- the proposed maximum instantaneous discharge rate enables a greater contaminant load to be discharged to the river; and

- there is significant potential for greater than anticipated nutrient inputs into both the Makoura Stream and the Ruamahanga River.

Having identified a number of concerns does not mean that the adverse effects of activities on the environment cannot be avoided, remedied or mitigated and as such extensive conditions have been recommended.

Overall, provided clarification is provided on the matters raised and that the activities are undertaken in accordance with the recommended consent conditions, I consider that the proposed upgrade of the MWWTP will be consistent with the purpose of the Act.

14. Conclusions

The applications are for a series of consents to upgrade and operate the MWWTP. The upgrade will result in an improvement in the water quality of Makoura Stream by discharging to land and the Ruamahanga River.

A number of matters identified in the assessment in section 12.4 need to be addressed by the applicant to ensure that the combined effects from leakage from the ponds, the sludge landfilling operation, land application of wastewater, and the discharge to the Ruamahanga River will meet the receiving environment standards required. The effects on air quality from the operation of the MWWTP are considered to be adequately avoided, remedied or mitigated by the measures proposed by the applicant.

The majority of the effects arising from construction activities could be managed by standard construction practices. However it is unclear how the dewatering aspects of the proposal will be managed.

With the recommended consent conditions it is considered that the proposed upgrade will be consistent with the purpose of the Act.

15. Recommendation

Pursuant to sections 104B, 105, 107 and 108 of the Act, I recommend that consents WAR090066 applied for by Masterton District Council be granted for the durations recommended in section 16 of this report, and subject to the suggested conditions included in section 17 of this report.

16. Term of consents

The applicant has requested a 35 year duration for all of the applications required for the construction and ongoing operation of the MWWTP. A number of the consents are construction-related (27170, 27171 and 27172) and do not need a 35 year term. A term of seven years is considered appropriate for these consents.

The remaining applications relate to the discharge aspects of the proposal and those activities associated with the construction and maintenance of structures in Makoura Stream and the Ruamahanga River.

A number of submitters raised the issue of the applicant's request for a 35 year consent term as they seek a shorter term. A term of 35 years would be contrary to achieving the zero discharge to surface water that a number of submitters seek. The cost of the proposed upgrade for the Masterton community has already been acknowledged. It is necessary to weigh the need for investment certainty against the possibility of significant adverse effects. The HortResearch report considers the effects of irrigating the soils over a period of 28 years. The AEE concludes that the analysis *"indicates that there is at least 28 years life (and likely longer) in the soils' capacity to accept the effluent under the operation proposed."* A number of critical issues have been raised in the land disposal technical report that would impact on the ability of the soils to accept the levels of irrigation proposed which in turn throws doubt on the life of the soils.

On balance given the significant uncertainties raised about the effects of the proposal a ten year term is considered appropriate. However, accepting the capital investment required, a term of 15 years is recommended.

The term of consent recommended may seem more stringent that other wastewater consents granted in the Wellington region however it is necessary to put the Masterton discharge into context within the region. For example, the Moa Point consents are expected to receive a term of 25 years (currently in final stages of Environment Court mediation) but the Moa Point discharge quality is high and the receiving environment (Cook Strait) less sensitive. Another discharge is the Hutt Valley Wastewater Services permit that also discharges to Cook Strait, which received a term of 25 years. This report has identified the values of Ruamahanga River receiving environment and the high degree of uncertainty around the proposed MWWTP discharge. The MWWTP discharge is the most significant point-source discharge to freshwater in the Wairarapa and, when compared to other wastewater discharges in the region, the applicant's proposal has a higher degree of uncertainty around the effects on the receiving environment. Therefore for the reasons stated, a term less than the 35 years sought by the applicant has been recommended.

17. Reasons for conditions

Adherence to the recommended conditions for the suite of consents will ensure that the adverse environmental effects associated with the continued operation

of the Masterton WWTP are avoided, remedied or mitigated. The rationale for a number of the conditions has already been discussed in section 12.4.

The condition relating to the submission of an **Operation and Management Manual** of the plant addresses the lack of detailed information relating to the plant's operation provided in the application, and the Manual will provide Greater Wellington and the consent holder with a useful one-stop reference source that documents essential operational and management information needed to ensure consent conditions will be met.

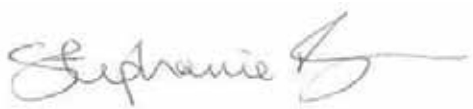
The conditions relating to the **quality and monitoring of the treated wastewater** seek to ensure that adverse environmental effects of the proposed discharges can be avoided, remedied or mitigated.

Monitoring of the receiving waters, **groundwater and soil** is required to ensure that the adverse effects remain acceptable and to detect whether any unforeseen effects are occurring. The consent holder is required to report the results of all monitoring undertaken to Greater Wellington.

Appropriate permanent **signage** has been requested; this will ensure that members of the public are informed about the human health risks associated with the discharges.

The conditions make provision for the staged upgrade, for example, the irrigation scheme is to be commissioned in Spring 2011 meaning that the existing discharge to the Makoura Stream will no longer be required after this period. However, it is not clear whether it is possible to commission the new outfall earlier than this so to remove the effects of the wastewater on the Makoura Stream as soon as possible. It is acknowledged that the proposal to connect the outfall structure to the new ponds, as opposed to the existing ponds, may be the limiting factor however removing the discharge from the Makoura Stream should occur as soon as possible.

Report prepared by:



STEPHANIE BROWN
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Recommendation approved by:

AL CROSS
Manager, Environmental Regulation

~~18.~~18. Suggested conditions

It is recognised that during the course of the hearing these conditions may alter based on the evidence presented and any refinement required. The conditions relating to the location of monitoring sites, timing of monitoring and when effluent and receiving environment standards apply will need to be confirmed at the hearing as they are dependent on the construction timeline.

The surface water quality report contains a series of recommendations about the nature and type of conditions required. These recommendations have been used in drafting the suggested conditions. The land disposal report contains suggested conditions that have been included in the condition wording below with some changes to ensure integration with other conditions and provide clarity in interpretation.

The conditions below are presented with the ongoing consents and construction-related consents each grouped accordingly.

ONGOING CONSENTS

Schedule 1: General Conditions applying to:

WAR 090066 (27160) – Discharge permit to discharge treated wastewater (effluent) to the Ruamahanga River.

WAR 090066 (27161) - Discharge permit to discharge stormwater runoff from the wastewater irrigation land to the Ruamahanga River and Makoura Stream.

WAR 090066 (27162) - Discharge permit to discharge treated wastewater (effluent) to land via an irrigation system.

WAR 090066 (27163) - Discharge permit to discharge partially treated wastewater (effluent) to land and groundwater through the base of the existing oxidation ponds and new oxidation ponds.

WAR 090066 (27164) - Discharge permit to discharge wastewater sludge and residual liquid to land from the sludge dewatering process and sludge landfill.

WAR 090066 (27165) - Discharge permit to discharge odours and aerosols to air from the oxidation ponds, land irrigation system, and sludge dewatering process and landfill, and other activities from the site.

WAR 090066 (27166) - Water permit to divert surface water in the Ruamahanga River during flood events by upgrading existing stopbanks.

WAR 090066 (27169) - Land use consent to disturb the bed of the Ruamahanga River arising from construction and maintenance of the diffuser outfall and erosion protection works adjacent to the existing oxidation ponds.

WAR 090066 (27170) - Discharge permit to discharge sediment-laden stormwater to the Ruamahanga River and Makoura Stream arising from bulk earthworks.

Works in accordance with application

1. The location, design, implementation and operation of the activity shall be in general accordance with the consent application and its associated plans and documents lodged with the Wellington Regional Council on 15 August 2008.

2. Where there may be contradiction or inconsistencies between the application and further information provided by the applicant, the most recent information applies. In addition, where there may be inconsistencies between information provided by the applicant and conditions of the consent, the conditions apply.

Progress reports

3. The permit holder shall provide to the Manager Environmental Regulation, Wellington Regional Council, a six monthly report detailing progress of the upgrade. The first report shall be due six months after the commencement of these permits with subsequent reports provided at six monthly intervals until June 2015, or such time that

all construction works are complete and commissioned. The report shall as a minimum include:

(a) a timeline for the upgrade works and comment on any changes to the timeline;
(b) a list of works undertaken in the previous six months; and
(c) a list and timeline of proposed works for the forthcoming six months.

Inflow and Infiltration

4. The permit holder shall undertake all reasonable efforts to reduce the influence of groundwater inflows and stormwater infiltration on wastewater flows entering the treatment plant. This shall include preparation and implementation of a 10-year Inflows and Infiltration Reduction Plan within six months of the granting of these consents.

Management Plans

5. Where a management plan is required to be submitted it:
   (a) shall be forwarded to the Manager Environmental Regulation, Wellington Regional Council;
   (b) address the matters set out in the respective management plan;
   (c) comply with the conditions of all relevant consents; and
   (d) be to the satisfaction of Wellington Regional Council.

   Advice note: The term "to the satisfaction of the Wellington Regional Council" means that the management plan shall be confirmed in writing by the Wellington Regional Council as containing all the requirements as specified in the conditions, including level of detail of what is to be included in the plan.

Operations and Management Plan

6. No later than six months prior to the commissioning of the irrigation scheme of this permit, the permit holder shall prepare and forward, an Operations and Management Manual to provide for the effective and efficient operation of the wastewater treatment and irrigation system. The system shall be managed and operated in accordance with this manual, which shall be updated within six months of the commissioning of the upgraded wastewater treatment system and at other times as appropriate. The manual shall include as a minimum:
   (a) a brief description of the treatment and disposal system, including a site map indicating the locations of all wastestreams entering the treatment system, treatment device(s), point of discharge, and monitoring sites;
   (b) operational management of the irrigation system;
   (c) on-site responsibilities, including operation and maintenance of the transfer pipeline to the site;
   (d) how the system will be operated and maintained to meet the requirements of the conditions of these permits;
   (e) identification of individual paddocks;
   (f) how the wastewater outfall will be maintained to ensure it remains intact, positioned correctly and achieves the necessary dilution required to ensure compliance with conditions 2, 3, 5, 6 and 7 of Schedule 2;

(g) the control and regulation of irrigation application, including application depths, return periods, and soil moisture monitoring;
(h) the proposed harvesting regime, including recording of nitrogen removal and compliance with consent conditions;
(i) management of the ponds (new and existing) and landfilling operation;
(j) key operational matters, including daily, weekly and monthly maintenance checks;
(k) procedures to be taken in the event that the groundwater parameters list in Condition 38 of Schedule 2 reach the quality limits in Condition 17 of Schedule 2;
(l) monitoring procedures covering all aspects of these permits to demonstrate compliance with the conditions;
(m) contingency plans in the event of system malfunctions or breakdowns;
(n) how changes in wastewater composition are to be managed; and
(o) the means of receiving and dealing with any complaints.

Records of maintenance, complaints, malfunctions and breakdowns shall be kept in a log and a copy of the log shall be made available to any Wellington Regional Council officer on request.
The management plan shall be reviewed as a minimum every two years on the anniversary of the exercise of the permit or at other times as appropriate.

Complaints

7. The permit holder shall keep a record of any complaints that are received. The record shall contain the following details, where practicable:
   (a) name and address of the complainant;
   (b) identification of the nature of the complaint;
   (c) date and time of the complaint and of the alleged event;
   (d) weather conditions at the time of the complaint; and
   (e) any measures taken to address the cause of the complaint.

   The permit holder shall notify the Manager, Environmental Regulation, Wellington Regional Council of any complaints relating to the exercise of this permit, within twenty-four hours of being received by the permit holder or the next working day.

   The permit holder shall forward to the Manager, Environmental Regulation, Wellington Regional Council a copy of any complaints recorded in the annual report required by condition 8 of these General Conditions.

Reporting

8. The permit holder shall provide a report to the Manager Environmental Regulation, Wellington Regional Council, in electronic and written format by no later than the last day of each calendar month incorporating the results of all monitoring undertaken in accordance with conditions [insert condition numbers once finalised - surface water] and conditions [insert condition numbers once finalised - soils/groundwater] of these permits for the preceding calendar month. The monthly report shall include reasons for any non-compliance and subsequent actions undertaken to remedy the non-compliance.

9. The permit holder shall provide to the Manager Environmental Regulation, Wellington Regional Council, an annual monitoring report by 30 June each year summarising compliance with the conditions of these permits. This report shall include as a minimum:
   (a) a summary of all monitoring undertaken in accordance with the conditions of this permit and a critical analysis of the information in terms of compliance and adverse environmental effects; and
   (b) a discussion on any trends or changes in environmental effects evident from the monitoring data, both within the annual period and compared to previous years; and
   (c) a summary of nitrogen application rates for any irrigated portion of the site, in terms of kilograms nitrogen per hectare per annum, and crop yields removed from the farm, in kg N/ha/yr on a per paddock basis; and
   (d) detailed comment on any groundwater inflow and stormwater infiltration reduction measures implemented in the preceding 12 months, including their effectiveness and planned measures for the coming 12 months; and
   (e) comment on compliance with the conditions of this permit; and
   (f) any reasons for non-compliance or difficulties in achieving compliance with the conditions of this permit; and
   (g) any measures that have been undertaken, or are proposed to be undertaken in the upcoming 12 months, to improve the environmental performance of the wastewater treatment and disposal system; and
   (h) any recommendations on alterations/additions to the monitoring programmes; and
   (i) copies of the laboratory analytical results monitoring results; and
   (j) any other issues considered important by the permit holder.

   The annual monitoring report is to cover the preceding 12 month period from 1 May to 30 April inclusive.

Warning signage

10. For the duration of these permits, the permit holder shall:
   (a) maintain appropriate signage on the true left and true right river banks in the immediate vicinity of the wastewater outfall and Wardell's Bridge to the satisfaction of the Manager Environmental Regulation, Wellington Regional Council. The signage shall:
      - provide clear identification of the location and nature of the discharge; and
      - state the width and downstream distance of the mixing zone authorised by this permit; and
      - provide a 24-hour contact phone number; and
      - be visible to the public visiting the area and legible from a distance of 50 metres without unnecessarily detracting from the visual amenity of the area.

   (b) maintain appropriate signage on the boundaries of the site which shall be legible to a person during daylight hours, warning that partially treated wastewater is discharged to land and may be present at the site.

Written confirmation of the signage placement accompanied by photographs of the signage shall be provided to the Manager Environmental Regulation, Wellington Regional Council within three months of the commencement of this permit and again within three months after installation of the diffuser outfall.

Note: The permit holder shall consult with Wairarapa Public Health regarding the wording of the signs prior to be submitting them for approval to Wellington Regional Council.

Breakdown/emergency notification

11. The permit holder shall notify the Manager Environmental Regulation, Wellington Regional Council as soon as practicable and, as a minimum requirement, within 48 hours of any accidental discharge, plant breakdown or other contingency which is likely to result in an exceedance of the limits of these permits.

Review & Charges

12. Wellington Regional Council may review any or all conditions of these permits by giving notice of its intention to do so pursuant to section 128 of the Resource Management Act 1991, at any time within three months of 30 June for each year for the term of these permits, for any of the following reasons:
    (a) to review the adequacy of, and if necessary amend the monitoring requirements outlined in this permit;
    (b) if receiving environment standards are exceeded on more than one occasion in any year and the exceedances can be attributed with reasonable certainty to discharges from the MWWTP;
    (c) to address any adverse effects on the environment arising from the exercise of this permit; or
    (d) to avoid, remedy or mitigate any significant adverse effect on the environment arising from the discharge.

    The review of conditions shall allow for the deletion or amendment of conditions of this permit; and the addition of such new conditions as are shown to be necessary to avoid, remedy or mitigate any significant adverse effects on the environment.

13. The Wellington Regional Council shall be entitled to recover from the consent holder the costs of the conduct of any review, calculated in accordance with and limited to that Council's scale of charge in force and applicable at that time pursuant to Section 36 of the Resource Management Act 1991.

14. A resource management charge, set in accordance with Section 36(2) of the Resource Management Act 1991 shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of resource consents and for the execution of its functions under Section 35 (duty to gather information, monitor and keep records) of the Act.

Schedule 2: Specific Resource Consent Conditions

WAR 090066 (27160) – Discharge permit to discharge treated wastewater (effluent) to the Ruamahanga River.

WAR 090066 (27161) - Discharge permit to discharge stormwater runoff from the wastewater irrigation land to the Ruamahanga River and Makoura Stream.

WAR 090066 (27162) - Discharge permit to discharge treated wastewater (effluent) to land via an irrigation system.

WAR 090066 (27163) - Discharge permit to discharge partially treated wastewater (effluent) to land and groundwater through the base of the existing oxidation ponds and new oxidation ponds.

As identified in the surface water quality technical report, in terms of setting restrictions on the maximum daily wastewater volume and/or nutrient loads for the discharge to the river, the approach has been to limit the average daily dry weather discharge volume based on current and predicted (2015) wastewater flows, along with the maximum instantaneous discharge rate, based on the existing peak wet weather flow (i.e., 700 L/s).

It is recognised that such restrictions may have implications for the viability of the proposed WWTP operation as additional discharge to land and/or storage is likely to be needed. This will need to be discussed at the hearing. In particular, we require clarification from the applicant on the rationale for and intended application of the minimum dilution ratio and maximum instantaneous discharge rate. Discharge quality standards may also need to be discussed at the hearing as some of the standards proposed by the applicant represent a significant increase in existing contaminant concentrations.

These permits shall be exercised subject to the following conditions together with those conditions specified in Schedule 1: General Conditions.

Construction of new outfall to Ruamahanga River

1. Prior to discharging from the new outfall to the Ruamahanga River the permit holder shall have provided an alternative stockwater supply to the property of R. & M. Ternent.

Discharge regime before and after 31 October 2011

2. From the commencement of these permits until 31 October 2011, treated wastewater shall only be discharged to Makoura Stream and the Ruamahanga River:
   ~~a)~~(a) up to a maximum instantaneous discharge rate of 700 L/s; and
   ~~b)~~(b) with an average dry weather discharge volume not exceeding 15,750 m^3/day; and
   ~~c)~~(c) for the Ruamahanga River only: when the mean hourly river flow at Wardell's Bridge gauge station is greater than 6.15 m^3/s.

3. From 1 November 2011 onwards, treated wastewater shall only be discharged to the Ruamahanga River:
   ~~a)~~(a) during 1 November to 30 April inclusive, when the mean hourly river flow at Wardell's Bridge gauge station is greater than 12.3 m^3/s and less than 300 m^3/s; or
   ~~b)~~(b) during 1 May to 31 October inclusive, when the mean hourly river flow at Wardell's Bridge gauge station is greater than 6.15 m^3/s and less than 300 m^3/s; and
   ~~c)~~(c) when the instantaneous flow in the river at Wardell's Bridge gauge station is at least **XX** times more than the instantaneous discharge rate; and
   ~~d)~~(d) up to a maximum instantaneous discharge rate of 700 L/s; and
   ~~e)~~(e) at an average dry weather discharge volume not exceeding 16,300 m^3/day.

Wastewater quantity monitoring

4. The permit holder shall continuously measure and maintain daily records of wastewater flows entering the treatment plant and the volume of the treated wastewater discharged to Makoura Stream, the Ruamahanga River or land irrigation system to the satisfaction of the Manager Environmental Regulation, Wellington Regional Council. The flow measuring devices shall be capable of continuously measuring wastewater flows of magnitudes up to and beyond the peak instantaneous flow rate, and shall be maintained to ensure that measurement error is no more than ± 5%. *(Comment: assumes flow meter would be in pipe, if a weir design would need to be 10%)*

Mixing zone

5. Up until 31 October 2011, the wastewater discharge shall not give rise to any of the following effects in the receiving waters outside of a mixing zone extending downstream of the point of discharge to Wardell's Bridge:
   ~~a)~~(a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials; or
   ~~b)~~(b) any conspicuous change in the colour or visual clarity; or
   ~~c)~~(c) any emission of objectionable odour; or
   ~~d)~~(d) any significant adverse effects on aquatic life; or
   ~~e)~~(e) any heterotrophic or nuisance periphyton growths.

6. From 1 November 2011, the permit holder shall maintain the wastewater discharge and the outfall diffuser to ensure that the discharge is reasonably mixed 200 m downstream of the outfall and fully mixed 800 m downstream of the outfall.

7. From 1 November 2011, after reasonable mixing, the treated wastewater discharge shall not give rise to any of the following effects in the Ruamahanga River:
   ~~a)~~(a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials; or
   ~~b)~~(b) any conspicuous change in the colour of the river; or
   ~~c)~~(c) a reduction in horizontal visibility greater than 30% (black disc measurement) compared with upstream of the discharge; or

~~d)~~(d) any emission of objectionable odour; or
~~e)~~(e) the rendering of fresh water unsuitable for consumption by farm animals; or
~~f)~~(f) any significant adverse effects on aquatic life; or
~~g)~~(g) the ammoniacal nitrogen concentration to exceed 0.8 g/m^3; or
~~h)~~(h) any heterotrophic or nuisance periphyton growths.

Sampling and analysis

8. All sampling techniques employed in respect of the conditions of this permit shall be to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council.

9. All soil and water sample analyses shall be undertaken in accordance with the methods detailed in the "Standard Methods For The Examination Of Water And Waste Water, 2005" 21st edition by A.P.H.A. and A.W.W.A. and W.E.F., or any other method approved in written advance by the Manager, Environmental Regulation, Wellington Regional Council.

10. Unless specifically approved otherwise in writing by the Manager Environmental Regulation, Wellington Regional Council, all analytical testing undertaken in connection with this consent shall be performed by a laboratory that is IANZ accredited for the analytical tests.

Wastewater monitoring programme and standards prior to discharge to Makoura Stream

11. The permit holder shall monitor the final discharge from the oxidation ponds according to the following frequency, constituents and detection limits:

Constituent	Monitoring Frequency	Detection Limit
Flow (influent and effluent)	Continuously	10%
pH	As per *E. coli*	0.1 pH
Temperature	Weekly	0.1 °C
Colour and Clarity:		
Total Suspended Solids	Monthly	0.1 g/m^3
Total Solids	Monthly	0.1 g/m^3
Colour	As per *E. coli*	
Foam and Scum	As per *E. coli*	
Oxygen Demand:		
Dissolved Oxygen	Weekly	0.2 g/m^3
BOD_5	Monthly	1 g/m^3
Nutrients:		
Total Nitrogen	Monthly	0.1 g/m^3
Nitrite-N	Monthly	0.1 g/m^3
Nitrate-N	Monthly	0.1 g/m^3
Total Kjeldahl Nitrogen	Monthly	0.1 g/m^3
Ammonia-N	Monthly	0.1 g/m^3
Dissolved reactive phosphorus	Monthly	0.1 g/m^3
Total phosphorus	Monthly	0.1 g/m^3

Metals & Metalloids:		
Cd, Cu, Ni, Pb, Zn, Hg, As, Ag, Cr	Annually	0.001 g/m^3
Alkalinity & hardness	Annually	0.1 g/m^3
Organics:		
Total Petroleum Hydrocarbons (TPH), Poly Aromatic Hydrocarbons (PAH), Semi Volatile Organic Hydrocarbons (SVOC), Volatile Organic Hydrocarbons (VOC)	Annually	0.001 g/m^3
Pathogens & Indicators:		
E. coli	Weekly (1st December – 31st March), Fortnightly (1st April - 30th November)	10 cfu/100mL

12. The discharge shall comply with the standards specified below. The standards in the table are a rolling geometric mean and shall be calculated based on the last 12 consecutive sample results.

Parameter	Unit	Standard
E. coli	cfu/100 ml	1200
BOD_5	g/m^3	32
Suspended Solids	g/m^3	42
Total Nitrogen	g/m^3	13
Ammonia-N	g/m^3	2.0 (summer) 7.0 (winter)
Total Phosphorus	g/m^3	3.3

Note: 'Summer' is defined as the period 1 November to 30 April inclusive
'Winter' is defined as the period 1 May to 31 October inclusive

13. The permit holder shall monitor receiving water quality at the frequencies and detection levels specified below:

Constituent	Unit	Detection Limit	Frequency
Field measurements:			
pH	pH	0.1	Monthly
Conductivity	µS/cm	0.1	Monthly
Dissolved Oxygen	g/m^3	0.01	Monthly
Dissolved Oxygen percent saturation (by calculation)		5%	Monthly
Black Disc	Metres	0.1	Monthly
Colour	Munsell	-	Monthly
Bacteriological analysis:			
E. coli	cfu/100 mL	1	Weekly (1st December - 31st March), Monthly (1st April - 30th

			November)
Nutrients:			
Ammonia-N	g/m^3	0.01	Monthly
Nitrate-N	g/m^3	0.002	Monthly
Nitrite-N	g/m^3	0.002	Monthly
Total Kjeldahl Nitrogen	g/m^3	0.1	Monthly
Total Nitrogen (by calculation)	g/m^3	0.1	Monthly
Total Phosphorus	g/m^3	0.004	Monthly
Dissolved Reactive Phosphorus	g/m^3	0.004	Monthly
Biological Analysis:			
Macroinvertebrate analysis (species composition and abundance - to SQMCI level of identification)			Annually
Periphyton taxonomic and biomass assessment (qualitative and quantitative)			Annually
Miscellaneous:			
Turbidity	NTU	0.05	Monthly
Total Organic Carbon (TOC)	g/m^3	0.5	Monthly

14. The locations of the sampling carried out under Condition 13 are::
    - Makoura Stream, upstream of the oxidation pond discharge, at or about Map Reference NZMS 260 T26:352-202;
    - Makoura Stream, downstream of the oxidation pond discharge at or about Map Reference NZMS 260 T26:353-197;
    - Ruamahanga River, upstream of the confluence with the Makoura Stream and the oxidation ponds at or about Map Reference NZMS 260 T26:364-202;
    - Ruamahanga River at Wardell's Bridge at or about Map Reference NZMS 260 T26:346-190; and
    - Ruamahanga River, just upstream of the Waingawa River confluence at or about Map Reference NZMS 260 T26:342-188.

Wastewater monitoring programme and standards and monitoring following commencement of discharge to the Ruamahanga River or land

15. Flow in the Makoura Stream upstream and downstream of the land irrigation area shall be measured continuously. The flow measuring devices shall be maintained to ensure that the measurement error is no more than ± 10%.

16. Treated wastewater discharged to the Ruamahanga River and land shall comply with the following criteria:

Parameter	Standard Type	Standard
pH	Range	6-9 pH units
Total Carbonaceous BOD_5	Rolling 12-month median Rolling 12-month 95th percentile	15 g/m^3 35 g/m^3
Soluble BOD_5	Rolling 12-month median Rolling 12-month 95th percentile	6.0 g/m^3 20 g/m^3

Total Suspended Solids	Rolling 12-month median Rolling 6-month 95th percentile	20 g/m3 70 g/m3
Escherichia coli	Rolling 6-month median Rolling 12-month 95th percentile	300 cfu/100 mL (summer) 1,000 cfu/100 mL (winter) 1,800 cfu/100 mL
Faecal coliforms (discharge to land only)	Rolling 12-month median	10,000 MPN/100mL
Ammoniacal Nitrogen	6-month median Maximum	Summer: 2.0 g/m3 Winter: 6.5 g/m3 Summer: 12 g/m3 Winter: 12 g/m3
Dissolved Inorganic Nitrogen	6-month median Maximum	Summer: 2.75 g/m3 Winter: 7.0 g/m3 Summer: 14 g/m3 Winter: 14 g/m3
Nitrate nitrogen (discharge to land only)	Rolling 12-month median	10 g/m3
Total Nitrogen	Rolling 12-month median Rolling 12-month 95th percentile	14 g/m3 18 g/m3
Dissolved Reactive Phosphorus	Rolling 12-month median Rolling 12-month 95th percentile Maximum	3.0 g/m3 4.0 g/m3 XX kg/d (applies to river only)
Total Phosphorus	Rolling 12-month median Rolling 12-month 95th percentile	3.5 g/m3 4.5 g/m3
Total recoverable arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver and zinc	Maximum	20 times the relevant freshwater toxicity trigger values (for the 95% level of species protection) in Table 3.4.1 of the Australian and New Zealand Environmental and Conservation Council (ANZECC, 2000) Water Quality Guidelines

Compliance with the wastewater quality standards set out in the table above shall be determined from the results of any 12 consecutive sampling events undertaken in accordance with condition 22 (six consecutive sampling events for *Escherichia coli* and ammoniacal nitrogen).

Advice note: This condition is included to acknowledge that the Masterton sewer collection systems suffers from a high rate of groundwater infiltration which ultimately provides for a dilution of the wastewater, and that proposed improvements to the sewer system will reduce the inflow which will have the potential to change the composition of the wastewater being discharged from the

wastewater treatment ponds. Should the wastewater composition discharged vary significantly, then it may influence and result in effects on the receiving environment different to that which has been modelled and forming the basis of the assessment of environmental effects undertaken for these permits.

17. The permit holder shall obtain representative measurements of the treated wastewater immediately prior to discharge to the Ruamahanga River or land as follows:

Parameter	Measurement unit and detection limit	Minimum Frequency
Rainfall	0.5 mm	Daily
Temperature	0.1 °C	Weekly
Dissolved oxygen	0.1 g/m^3	Weekly
pH	0.1 pH	Weekly
Electrical conductivity	10 uS/cm	Weekly
Colour	Visual observation	Weekly
Foam and Scum	Visual observation	Weekly
Total BOD_5	1 g/m^3	Weekly*
Soluble BOD_5	1 g/m^3	Weekly*
Total suspended solids	1 g/m^3	Weekly*
Escherichia coli	10 cfu/100 mL	Weekly*
Ammoniacal nitrogen	0.1 g/m^3	Weekly*
Nitrite nitrogen	0.1 g/m^3	Weekly*
Nitrate nitrogen	0.1 g/m^3	Weekly*
Total kjeldahl nitrogen	0.1 g/m^3	Weekly*
Total nitrogen (by calculation)	0.1 g/m^3	Weekly*
Dissolved reactive phosphorus	0.1 g/m^3	Weekly*
Total phosphorus	0.1 g/m^3	Monthly
Sodium	0.05 g/m^3	Six monthly
Calcium	0.05 g/m^3	Six monthly
Chloride	0.5 g/m^3	Six monthly
Total Potassium	0.05 g/m^3	Six monthly
Total recoverable arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver and zinc	0.001 g/m^3	Annually in February or March
Alkalinity & hardness	0.1 g/m^3	Annually in February or March
Polycyclic aromatic hydrocarbons	0.001 g/m^3	Annually in February or March
Semi-volatile organic hydrocarbons	0.001 g/m^3	Annually in February or March
Volatile organic hydrocarbons	0.001 g/m^3	Annually in February or March

The monitoring frequency for parameters identified for weekly monitoring marked with a * can be downscaled to monthly if there has been no discharge to land since the previous sample. Weekly sampling shall recommence within one week of the next discharge to land.

Note: The permit holder may want to include additional parameters to assist the sale of the harvested crops.

18. In February or March each year, the permit holder shall obtain representative grab samples of the treated wastewater prior to discharge to the Ruamahanga River. These samples shall be analysed for:

Parameter	Measurement unit and detection limit
Total recoverable arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver and zinc	0.001 g/m^3
Alkalinity & hardness	0.1 g/m^3
Polycyclic aromatic hydrocarbons	0.001 g/m^3
Semi-volatile organic hydrocarbons	0.001 g/m^3
Volatile organic hydrocarbons	0.001 g/m^3

Receiving water monitoring programme and standards - Ruamahanga River

19. The combined discharges of wastewater to land via irrigation and seepage shall not cause:

~~i)~~(a) the dissolved reactive phosphorus concentration in the Ruamahanga River as measured at Wardell's Bridge to exceed 0.012 g/m^3 or to be more than 20% greater than the upstream concentration; or

~~ii)~~(b) the dissolved inorganic nitrogen concentration in the Ruamahanga River as measured at Wardell's Bridge to exceed 0.580 g/m^3 or to be more than 20% greater than the upstream concentration; or

~~iii)~~(c) the percentage cover of filamentous algae on the riverbed to exceed 30%; or

~~iv)~~(d) the percentage cover of algal mats on the riverbed to exceed 60%.

Compliance with the receiving water standards set out above shall be determined on a monthly basis from the results of upstream and downstream sampling undertaken in accordance with conditions 20 and 21. The upstream sampling results will be taken into account when assessing compliance with this condition.

20. From the commencement of a discharge to land irrigation system, at monthly intervals during November to April inclusive when there is no direct discharge of wastewater to the Ruamahanga River, the permit holder shall collect representative water samples from the Ruamahanga River at each of the following locations:

~~i)~~(a) upstream of the land irrigation area, at or about Map Reference NZMS 260 T26:358-218;

~~ii)~~(b) approximately 1000 m upstream of the diffuser outfall, at or about Map Reference NZMS 260 T26:364-202;

~~iii)~~(c) approximately 200 m downstream of the diffuser outfall, at or about Map Reference NZMS 260 T26:354-197; and

~~iv)~~(d) approximately 1,250 m downstream of the diffuser outfall at Wardell's Bridge, at or about Map Reference NZMS 260 T26:346-190.

The samples shall be analysed for:

Parameter	Measurement unit and detection limit
Ammoniacal nitrogen	0.01 g/m^3
Nitrite nitrogen	0.002 g/m^3
Nitrate nitrogen	0.002 g/m^3
Dissolved reactive phosphorus	0.004 g/m^3

21. From the commencement of a discharge to land, and to coincide with the monthly water sampling during November to April inclusive under condition 20, the permit holder shall undertake an assessment of the percentage cover of both filamentous algae and cyanobacterial mats (to nearest 5%) at 10 points across each of four transects encompassing both riffle and run habitat and extending across the width of the river at each sampling site listed in condition 16. The average value for each site shall be used to determine compliance with the periphyton cover guidelines specified in condition 19.

22. (a) At regular monthly intervals to coincide with wastewater sampling undertaken in accordance with condition 17, representative water samples shall be collected from the Ruamahanga River at each of the following locations when treated wastewater is being discharged to the river:
    (i) upstream of the discharge and the influence of the land irrigation area (at or about Map Reference NZMS 260 T26:358-218);
    (ii) 200 m downstream of the discharge to the river (at or about Map Reference NZMS 260 T26:354-197); and
    (iii) approximately 1,250 m downstream of the discharge to the river at Wardell's Bridge (at or about Map Reference NZMS 260 T26:346-190).

    The samples shall be analysed for:

Parameter	Measurement unit and detection limit
Soluble BOD_5	1 g/m^3
Total organic carbon	0.5 g/m^3
Total suspended solids	1 g/m^3
Turbidity	0.05 NTU
Escherichia coli	1 cfu/100 mL
Ammoniacal nitrogen	0.01 g/m^3
Nitrite nitrogen	0.002 g/m^3
Nitrate nitrogen	0.002 g/m^3
Total kjeldahl nitrogen	0.1 g/m^3
Total nitrogen (by calculation)	0.1 g/m^3
Dissolved reactive phosphorus	0.004 g/m^3
Total phosphorus	0.004 g/m^3

    (b) At regular monthly intervals to coincide with the monitoring undertaken in accordance with condition 22(a), the following in-situ measurements shall be taken using field equipment calibrated in accordance with manufacturer's instructions:

Parameter	Measurement unit and detection limit
Water temperature	0.1 ˚C
Dissolved Oxygen	0.1 g/m^3 and1 % saturation
pH	0.1 pH
Electrical conductivity	0.1 µS/cm
Black disc (visual clarity)	0.1 m
Colour	Munsell scale

23. Once per year during the period 31 January to 30 April inclusive and following at least a two week period without a significant flood event (defined as the instantaneous river flow exceeding 37 m^3/s), the permit holder shall have an appropriately experienced and qualified freshwater ecologist carry out a quantitative ecological survey of the Ruamahanga River upstream and downstream of the point of discharge for the purpose of determining the effect of the discharge on the aquatic ecosystem of the river. The survey shall comprise as a minimum:
    (a) an inspection of the riverbed within the entire mixing zone (0-200 m downstream of the discharge) for the presence of any nuisance heterotrophic or periphyton growths; and
    (b) two upstream and two downstream periphyton and macroinvertebrate sampling sites in the general locations outlined in condition 20 that, where possible, share similar habitat features in terms of substrate, flow, depth and width.

    The periphyton survey shall include:
    - an assessment of the percentage cover of both filamentous algae and algal mats (to nearest 5%) at 10 points across each of four transects encompassing both riffle and run habitat and extending across the width of the river at each sampling site; and
    - collection of a composite periphyton sample from riffle and run habitat (a composite of scrapings from 10 rocks, 5 from a riffle and 5 from a run) across each sampling site using method QM-1a from the Stream Periphyton Monitoring Manual (Biggs & Kilroy 2000);
    - analysis of periphyton samples for community composition and abundance using the Biggs & Kilroy (2000) relative abundance method, ash free dry weight and chlorophyll *a*.

    The macroinvertebrate survey shall follow Protocols C3 and P3 from the Ministry for the Environment's report on protocols for sampling macroinvertebrates in wadeable streams (Stark et al. 2001). This shall involve:
    - collection of 5 replicate 0.1 m^2 Surber samples at random within a 20 m section of riffle habitat at each sampling site;
    - full count of the macroinvertebrate taxa within each replicate sample to the taxonomic resolution level specified for use of the Macroinvertebrate Community Index (MCI); and
    - enumeration of the results as taxa richness, MCI, QMCI, %EPT taxa and %EPT individuals.

    The results of the ecological survey shall be reported in writing to Manager Environmental Regulation, Wellington Regional Council by 1 June each year.

24. The permit holder shall within 24 hours of any monitoring undertaken in accordance with condition 21, notify the Manager Environmental Regulation, Wellington Regional Council, should the average cover of cyanobacterial mats at the Wardell's Bridge sampling site exceed 20%.

Receiving water monitoring programme - Makoura Stream

25. (a) From the commencement of a discharge to land, at monthly intervals for the duration of this permit, the permit holder shall collect representative water samples from the Makoura Stream at each of the following locations:
~~i)~~(i) immediately upstream of the land irrigation area at or about Map Reference NZMS 260 T26:353-217;
~~ii)~~(ii) within the land irrigation area at or about Map Reference NZMS 260 T26:354-210 and Map Reference NZMS 260 T26:352-202; and
~~iii)~~(iii) downstream of the land irrigation area prior to discharge to the Ruamahanga River (at or about Map Reference NZMS 260 T26:353-197).

The samples shall be analysed for:

Parameter	Measurement unit and detection limit
Escherichia coli	1 cfu/100 mL
Total organic carbon	0.5 g/m^3
Ammoniacal nitrogen	0.01 g/m^3
Nitrite nitrogen	0.002 g/m^3
Nitrate nitrogen	0.002 g/m^3
Total nitrogen (at site iii only)	0.01 g/m^3
Dissolved reactive phosphorus	0.004 g/m^3
Total phosphorus (at site iii only)	0.004 g/m^3

(b) At monthly intervals for the duration of this permit, to coincide with the monitoring undertaken in accordance with condition 25(a), the permit holder shall obtain the following *in-situ* measurements using a field meter calibrated in accordance with manufacturer's instructions:

Parameter	Measurement unit and detection limit
Water temperature	0.1 ˚C
Dissolved Oxygen	0.1 g/m^3 and 1 % saturation
pH	0.1 pH
Electrical conductivity	0.1 µS/cm

Land Application Requirements

26. The discharge of wastewater to land shall not result in the following:
(a) an annual application depth exceeding 2,500 mm;
(b) any location within an irrigation bay having a single application which exceeds 150 mm;
(c) the average application depth over the length of an irrigation bay exceeding 100 mm during a single application. The average daily application rate exceeding 10 mm;

(d) the distribution efficiency being less than 75 % during any single application;
(e) the application uniformity being less than 50 % during any single application;
(f) any significant surface water, including ponding, on the irrigation or wipe-off areas, as a result of irrigation, for a period of more than 24 hours after application;
(g) wastewater being applied to land within 100 m of any neighbouring property which exists at the time the consent is granted.

27. No wastewater shall be applied to land where:
(a) the annual nitrogen loading of wastewater will exceed 300 kg /ha/yr; or
(b) the mass of nitrogen and phosphorus applied annually as fertiliser and effluent exceeds 100 kg/ha and 30 kg/ha respectively of that removed in the harvested biomass; or
(c) there is surface water ponding on any irrigation area or in wipe-off drains; or
(d) there is the likelihood of significant surface water ponding for a period beyond 24 hours after application; or
(e) anaerobic conditions exist at the soil surface; or
(f) prior to application a wheeled tractor can not be driven over the area to be irrigated without leaving wheel rutting; or
(g) the groundwater depth is within 1 m of the soil's surface; or
(h) there is bare land, including weeds, covering more that 15 % of the area to be irrigated; or
(i) pasture, or a crop, has less than 4 weeks of growth after being replanted or sown; or
(j) there is a variation in application depth of more than 50 % between 10 % and 75 % of the bay run length (i.e. if a bay is 100 m long, the difference in application depth at 10 m and 75 m shall be no greater than 50 %); or
(k) the wipe-off volume exceeds 20 % of the applied volume.

Note 1: A bay is defined by the wetted area between two borders and its length is from the turnout (water source) to the furthermost wetted extent in that bay.

Note 2: Significant ponding is deemed to be surface water covering an area of more than 10 square metres or saturated soil conditions which cause an adverse effect on grass growth.

28. The annual nitrogen loading as a consequence of:
~~a)~~(a) the exercise of this permit; and/or
~~b)~~(b) the application of nitrogen based fertiliser; and/or
~~c)~~(c) the application of any other material
shall not exceed a maximum of 600 kilograms per hectare per year.

Irrigation Management

29. The permit holder shall appoint a suitably experienced Irrigation Operator to manage the site.

Advice Note: a suitably experienced person would be considered as someone with a farming background and irrigation experience.

30. The Irrigation Operator shall:
    (a) ensure that the land application area be used primarily as a cut and carry operation;
    (b) allow for the occasional grazing of sheep;
    (c) not allow the grazing of cattle or horses;
    (d) allow for the application of fertilisers to optimise pasture/crop growth;
    (e) allow for the growing of crops other than pasture; and
    (f) provide a 2 day withholding period following application and prior to any animal grazing.

31. The permit holder shall inspect the property at monthly intervals and as soon as practicable after heavy rainfall events, to record the presence or not of seepages, developing wet areas, changes in pasture or crop growth and any other physical change to the property which may impact on the irrigation or accelerate nutrient losses or reduced system performance. Records shall be kept of those inspections and made available to the Wellington Regional Council upon request.

Buffer area irrigation

32. The application of wastewater to buffer areas using drip irrigation shall comply with the requirements of conditions 26, 27 and 28.

Management of Wipe-off Drains

33. Wipe-off drains shall be managed so that they:
    (a) do not intercept or collect groundwater; and
    (b) do not allow the direct or immediate passage (through less that 10 m of soil) to surface water drainage which enters the Makoura Stream or Ruamahanga River; and
    (c) do not allow groundwater to be returned to the treatment ponds.

Increasing Application Rate

34. After a period of 24 months operation of at least 50 ha of the land application area, the permit holder can increase the average daily application rate to 200 mm and the annual application to 4,000 mm, subject to being able to demonstrate to the satisfaction of the Manager Environmental Regulation, Wellington Regional Council, that:
    ~~(a)~~(a) through appropriate monitoring that the application rates in conditions 26, 27 and 28 can be complied with;
    ~~(b)~~(b) the distribution and application uniformity requirements of conditions 26, 27, 28 can be complied with;
    ~~(c)~~(c) anaerobic conditions and wet areas are able to be avoided as required by condition 27;
    ~~(d)~~(d) groundwater monitoring shows the nominated water quality targets in condition 40 have not been exceeded;
    ~~(e)~~(e) through modelling it can be shown that the increase in application rate will not result in the exceedance of the nominated water quality targets in condition 40;

~~(f)~~(f) the increase in application rates is limited to application areas to the east of the Makoura Stream.

Increasing Nitrogen Loading

35. Following demonstration by the permit holder that an average nitrogen removal rate of 300 kg N/ha/yr, with no more that 100 kg of synthetic nitrogen fertiliser being applied, can be achieved, the consent holder can apply to the Wellington Regional Council to have the nitrogen loading rate increased to 500 kg N/ha/yr.

Groundwater Quality Monitoring Programme and Standards

36. The permit holder shall install monitoring bores at the following locations [attach map of sites] for the purposes of monitoring groundwater quality and water levels within six months of the commencement of these permits:

Monitoring Group	Location and purpose	HB1	HB3	HB4	HB9	HB11	HB12	BB13	HB16	HB23	HB24	HB28	HB29	HB31
1a	Up gradient of land application area							x						x
1b	Down gradient of land application area	x		x		x	x		x	x				
1c	Within land application area										x	x	x	
2a	Down gradient of land fill	x		x										
2b	Down gradient of de-sludging area	x	x	x										
3	Down gradient of ponds	x		x	x									

Note: the location and suitability of the monitoring bores need to be confirmed, especially for Monitoring Group 1c.

37. The permit holder shall collect representative groundwater samples in accordance with the Wellington Regional Council groundwater sampling protocol. The samples shall be analysed for the following parameters:

Sampling tier	Parameters sampled	Measurement unit and detection limit
T1	Water level	0.1 m
	Carbonaceous BOD	1 g/m^3
	Dissolved Reactive Phosphorus (DRP)	0.1 g/m^3
	Dissolved Inorganic Nitrogen (DIN)	0.1 g/m^3
	Nitrate-N (NO_3-N)	0.1 g/m^3
	Ammoniacal-N (NH_4-N)	0.1 g/m^3
	Faecal coliforms	MPN/100mL
	E. coli	10 cfu/100mL
	Soluble iron	0.001 g/m^3
	chloride	0.5 g/m^3

	pH conductivity	0.1 pH 10 uS/cm
T2	Water level Phosphorus (DRP) Dissolved Inorganic Nitrogen (DIN) Nitrate-N (NO_3-N) Ammoniacal-N (NH_4-N) Faecal coliforms	0.1 m 0.1 g/m^3 0.1 g/m^3 0.1 g/m^3 0.1 g/m^3 MPN/100mL
T3	Water level	0.1 m

38. Groundwater sampling of the Monitoring Groups shall occur within the following months:

Monitoring Group	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1a	T1		T2		T2		T1		T2		T2	
1b	T1		T2		T2		T1		T2		T2	
1c	T3	T3	T3	T3	T3	T3	T3	T3	T3	T3	T3	T3
2a	T1			T2			T1			T2		
2b	T1	T2	T2	T1	T2	T2	T1	T2	T2	T1	T2	T2
3	T1			T2			T1			T2		

39. The groundwater monitoring undertaken shall be for the following duration:

Monitoring Group	Start	Finish
1a	Within six months of consent commencement	Consent expires
1b	Within six months of consent commencement	Consent expires
1c	Within six months of consent commencement	Consent expires
2a	When discharge starts to landfill	Consent expires
2b	As ponds are dewatered	When remediation is completed
3	When discharge starts to new ponds	Consent expires

40. Ground water quality shall comply with the following:

	Primary values	Secondary (Not to exceed) values	
	Any two samples shall not exceed:	No one sample result shall exceed:	
Dissolved inorganic nitrogen	0.580	0.70	g/m^3
Dissolved reactive phosphorus	0.012	0.02	g/m^3
Faecal coliforms	50	200	MPN/100ml

Compliance with the groundwater standards set out above shall be determined from the results of sampling undertaken in accordance with conditions 37, 38 and 39.

Soil monitoring

41. The permit holder shall characterise the quality and variability of the physical and chemical properties across the land application area. Unless otherwise approved in writing by the Manager, Environmental Regulation, Wellington Regional Council, the permit holder shall undertake soil monitoring during June or July of each year. In this respect three composite soil samples shall be taken from representative locations on each of the Greytown sandy loam and Greytown silt loam soils and the following parameters reported upon:
    (a) infiltration capacity, bulk density;
    (b) soil moisture, pH, exchangeable sodium, Olsen phosphorus, total nitrogen%, organic carbon%, C:N ratio, anion storage capacity, cation exchange capacity. Analyses shall be undertaken on composite samples for each soil type at sampling depths of: 0-75 mm and 75-150mm;
    (c) prior to commencement of irrigation, then every 5 years from granting of the Permit the consent holder shall test for the elements Total As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Ni and Zn in both the irrigated and non-irrigated soils, within the 0-75 mm soil depth.

    Note: The soil groupings need to be confirmed.

Crop Monitoring

42. The permit holder shall record crop management practices across the site, including:
    (a) crop renovation areas, species used and reasons for the renovation;
    (b) dry matter content removed from the site;
    (c) the nitrogen content of batches of all dry matter removed form the site;
    (d) any fertiliser application, including type and amount applied; and
    (e) records of any grazing undertaken.

Pond Lining

43. The permit holder shall submit to the Manager, Environmental Regulation, Wellington Regional Council, at least one month prior to the commencement of construction activities a Pond Lining Management Plan that includes but is not limited to:
    (a) identifying the source of pond lining material;
    (b) the placing procedure for lining material;
    (c) a testing and quality control regime to demonstrate the attainment of the nominated permeability.

44. Constructed ponds shall be lined with suitable material to ensure permeability does not exceed 5×10^{-9} m/s. Should an earthen liner be used, it shall be no less then 400 mm in depth.

Pond Capacity

45. Wastewater ponds shall provide the capacity to store no less than 275,000 m^3. This shall be 'live' storage and not be relied on for treatment purposes.

    The provision of sufficient storage volume to ensure compliance with the conditions of this consent is the responsibility of the consent holder.

Groundwater Monitoring Action

46. Should any monitoring undertaken in accordance with condition 40 exceed the nominated Primary Values, the consent holder shall notify the Manager, Environmental Regulation, Wellington Regional Council within 14 days of the laboratory issuing the results. The notification shall identify what the exceedance is, why it was caused and steps being undertaken to ensure compliance.

47. Should any monitoring undertaken in accordance with condition 40 exceed the Secondary Values, the consent holder shall notify the Manager, Environmental Regulation, Wellington Regional Council within 7 days of the laboratory issuing the results. The notification shall identify what the exceedance is, why it was caused and the timing of the establishment of an alternative method for the activity which resulted in the non-compliance.

48. Should two samples in any 12 month period exceed the Primary Values, or if any individual sample exceeds the Secondary Values, the consent holder shall within 6 months have presented to the Manager, Environmental Regulation, Wellington Regional Council an alternative method for the activity which resulted in the non-compliance. Within 12 months of the exceedance the consent holder shall have implemented the alternative method.

WAR 090066 (27164) - Discharge permit to discharge wastewater sludge and residual liquid to land from the sludge dewatering process and sludge landfill.

This permit shall be exercised subject to the following conditions together with those conditions specified in Schedule 1: General Conditions.

Works in accordance with application

1. This permit only authorises the landfilling of sludge to the area identified as "Sludge Landfill (~0.7 ha)" on plan Proposed Pond Layout Plan 3202216-560-C602 that formed part of the application.

2. No irrigation of wastewater shall occur over the landfill area.

Landfill Management Plan

3. The consent holder shall submit, at least one month prior to any placement of material in the landfill, a Landfill Management Plan which includes, but is not limited to:
   (a) design and installation of lining material;
   (b) design and installation of capping material;
   (c) design and management of leachate retention and handling facilities;
   (d) moisture content requirements for placed material;
   (e) management of subsidence and slumping;
   (f) management of landfill gases.

Landfill Lining

4. The consent holder shall submit, at least one month prior to the commencement of construction activities, a Landfill Lining Plan that includes but is not limited to:
   (a) identifying the source of landfilling lining material;
   (b) the placing procedure for lining material;
   (c) a testing and quality control regime to demonstrate the attainment of the nominated permeability.

5. Constructed landfilling areas shall be lined with suitable material to ensure permeability does not exceed 5×10^{-9} m/s. Should an earthen liner be used, it shall be no less then 400 mm in depth.

Dewatering and Sludge Drying

6. Excessive leaching of contaminants below the base of the existing ponds during the dewatering/sludge drying process is not permitted.

   Excessive leaching shall be assessed by groundwater monitoring as required by Condition 36 (Schedule 2 Permits 27160, 27161, 27162 and 27163) and will have deemed to occurred if the water quality targets in Condition 40 (Schedule 2 Permits 27160, 27161, 27162 and 27163) have been exceeded.

7. The drying of sludge from the base of the existing wastewater treatment ponds shall be undertaken in accordance with the following:
   (a) Sludge shall be relocated within base of the existing ponds to facilitate drying and avoid contact with groundwater.
   (b) Sumps shall be created to assist with dewatering, with 'clean' water being pumped to the Makoura Stream and contaminated water to the new wastewater ponds.
   (c) Sludge with a moisture content of more than 95 %, as measured on a wet weight basis, (i.e. less than 5 % solids) shall be pumped to the new wastewater ponds.
   (d) No sludge is to be dried or stored, including temporarily, on the property which is outside the existing wastewater ponds or the new landfill site. This includes not allowing sludge to be stored on the surface of any remediated pond area.
   (e) All sludge shall be removed from the base of the existing wastewater ponds within 24 months of wastewater discharge to the new ponds commencing.

   Advice note: If dried sludge is to be used as a soil conditioner, or there is a need for temporary storage outside the base of the existing pond, then additional consent may be required.

8. No residual pond sludge, to within practical excavation limits, shall remain in the base of existing ponds following remediation.

   Advice note: For the purpose of this condition, practical excavation limits refers to not having material in clumps or layers which are greater that 25 mm in depth.

Landfill Operation

9. The sludge landfill operation shall:
   (a) Only received sludge from the dewatering of the existing wastewater treatment ponds.
   (b) Only receive material that has a moisture content of no greater than 65%, as measured on a wet weight basis (i.e. 35% solids).
   (c) Collect and discharge leachate from the land fill to the new wastewater treatment ponds.
   (d) Stormwater from the landfill shall be collected and discharged to ground soakage. It shall not contain any sludge material or leachate.

WAR 090066 (27165) - Discharge permit to discharge odours and aerosols to air from the oxidation ponds, land irrigation system, and sludge dewatering process and landfill, and other activities from the site.

This permit shall be exercised subject to the following conditions together with those conditions specified in Schedule 1: General Conditions.

1. There shall be no discharges to air that are noxious, dangerous, offensive or objectionable resulting from the operation of the Masterton wastewater treatment plant and land irrigation system at or beyond the boundary of the plant site as designated in the District Plan.

2. The consent holder shall develop and implement a Management Plan to address odour arising from operations. The Management Plan shall include but not be limited to recording of events which create an objectionable odour/aerosol occurrence and measures and maintenance regimes to prevent objectionable odour/aerosol.

WAR 090066 (27166) - Water permit to divert surface water in the Ruamahanga River during flood events by upgrading existing stopbanks.

This permit shall be exercised subject to those conditions specified in Schedule 1: General Conditions.

1. The consent holder shall notify the Manager, Environmental Regulation Wellington Regional Council, at least 48 hours prior to commencement of any works, and upon completion of works so that compliance inspections may be arranged.

2. The consent holder shall implement the following procedures if waahi tapu sites or other sites of value to tangata whenua are found:
   - work is to cease immediately;
   - the consent holder shall contact the Manager, Planning & Resources, Wellington Regional Council, Rangitaane o Wairarapa, and Ngati Kahungunu o Wairarapa immediately;
   - Representatives of Rangitaane o Wairarapa and/or Ngati Kahungunu o Wairarapa are to be given sufficient time to carry out an investigations of the site determine any cultural issues and an appropriate course of action. At the discretion of Manager, Planning & Resources, Wellington Regional Council, this action may include a permanent or temporary cessation of work on the site.

3. The consent holder shall, within 3 months of completion of the work authorised by this consent, submit a completion certificate prepared by a person suitably qualified in river engineering and stopbank construction which confirms that the work has been undertaken in accordance with the application and all associated plans.

4. Any substantial damage to the stopbank structure caused by flood events or other causes shall be repaired by the consent holder as soon as practicable.

5. The consent holder shall, at regular intervals for the life of the consent, visually monitor the structural integrity of the stopbank and record the condition and structural integrity of the stopbank. The consent holder shall effect any repairs necessary to maintain its structural integrity in accordance with the plans authorised by this consent.

6. The consent holder shall regrass the realigned stopbank and any borrow areas as soon as practicable following the completion of works.

WAR 090066 (27168) - Land use consent to construct, place, use, and maintain a structure (diffuser outfall) in the bed of the Ruamahanga River.

AND

WAR 090066 (27169) - Land use consent to disturb the bed of the Ruamahanga River arising from construction and maintenance.

These consents shall be exercised subject to the following conditions together with those conditions specified in Schedule 1: General Conditions.

1. The consent holder shall notify the Manager, Environmental Regulation Wellington Regional Council, at least 48 hours prior to commencement of any works, and upon completion of works so that compliance inspections may be arranged.

2. No construction works shall be carried out in the wetted channel of the Ruamahanga River during fish spawning/migration season [dates to be confirmed].

3. The consent holder shall take all practicable steps to minimise sedimentation and increased turbidity of the Ruamahanga River during the construction, implementation and maintenance of the works, including:
   ~~a.~~(a) acompleting all works in the minimum time practicable;
   ~~b.~~(b) minimising the area of disturbance at all times; and
   ~~c.~~(c) installing appropriate erosion sediment control measures.

4. The consent holder shall ensure that:
   ~~a.~~(a) all machinery is thoroughly cleaned of unwanted vegetation (e.g. weeds), seeds or contaminants prior to entering the site;
   ~~b.~~(b) no contaminants (including but not limited to oil, petrol, diesel, hydraulic fluid) shall be released into water from equipment being used for the works;
   ~~c.~~(c) all machinery is regularly maintained in such a manner so as to minimise the potential for leakage of contaminants; and
   ~~d.~~(d) no machinery is cleaned, stored or refuelled within 10 metres of the river.

5. The works shall remain the responsibility of the consent holder and be maintained so that:
   ~~a.~~(a) any erosion, scour or instability of the stream bed that is attributable to the works carried out as part of this consent is remedied by the consent holder; and
   ~~b.~~(b) the structural integrity of the structure authorised by this consent remain sound.

WAR 090066 (27167) - Water permit to permanently divert the Makoura Stream around the new oxidation ponds.

This permit shall be exercised subject to the following conditions together with those conditions specified in Schedule 1: General Conditions.

1. The consent holder shall notify the Manager, Environmental Regulation Wellington Regional Council, at least 48 hours prior to commencement of any works, and upon completion of works so that compliance inspections may be arranged.

2. A riparian management plan consistent with Greater Wellington Regional Council's 'Restoration Planting: A Guide to Planning Restoration Projects in the Wellington Region' shall be prepared. The Plan shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council no less than 2 months prior to this consent being exercised.

3. A minimum riparian buffer of 5 metres surrounding the new stream channel be permanently retired from farming and riparian planting undertaken consistent with the conceptual planting diagram attached in Appendix C of eth AEE (Boffa Miskell Makora Stream Diversion: Indicative Planting Plan), unless constrained by embankment and flood protection works.

4. In diverting the bed of Makoura Stream the consent holder shall ensure that:
   (a) The new channel is sized to ensure that the hydraulic capacity of the channel can contain a 50 year flow event;
   (b) The new stream bed is consistent with the natural meander and flow environment of the existing channel;
   (c) The bed of the new channels is constructed in a way that ensures that there is a minimal reduction in the base flow or transport capacity of as result of the diversion;
   (d) The work necessary to carry out the diversion is done in the dry stream bed prior to flows being diverted into the new channel;
   (e) Water is shall be diverted in stages over several hours to allow fish to escape the falling water level in the old stream channel;
   (f) Any fish stranded by the diversion are recovered and transferred to the new channel as soon as possible;
   (g) Bed disturbance shall does not damage any riverbank or cause any flooding or erosion;
   (h) All reasonable steps are shall be taken to minimise the release of sediment during the disturbance;
   (i) Best endeavours are undertaken to ensure that all bed disturbance does shall not damage any stream bank or cause any flooding or erosion;
   (j) All reasonable steps are shall be taken to minimise the release of sediment during the disturbance.

CONSTRUCTED RELATED CONSENTS

Schedule 1: General conditions applying to:

WAR 090066 (27170) - Discharge permit to discharge sediment-laden stormwater to the Ruamahanga River and Makoura Stream arising from bulk earthworks.

WAR 090066 (27171) - Discharge permit to discharge any treated wastewater and groundwater to water arising from dewatering processes at various locations.

WAR 090066 (27172) - Water permit to divert and take groundwater arising from dewatering processes from cut-off and drainage trenches during construction activities.

Procedures prior to commencement of works

1. The consent holder shall notify the Manager, Environmental Regulation Wellington Regional Council, at least 48 hours prior to commencement of each phase of works, and upon completion of each phase works so that compliance inspections may be arranged.

2. The permit holder shall ensure that a copy of this permit is kept on site at all times and presented to any Wellington Regional Council officer on request.

3. The permit holder shall provide a copy of this permit and any documents relating to this permit, to each operator or contractor undertaking works authorised by this permit, before that operator or contractor starts any works.

   Note: It is recommended that the permit holder verbally brief the operators or contractors regarding the conditions of this permit, prior to works commencing.

Management Plans

5. Where a management plan and the Erosion and Sediment Control Plan are required to be submitted it:
   (a) shall be forwarded to the Manager Environmental Regulation, Wellington Regional Council;
   (b) address the matters set out in the respective management plan;
   (c) comply with the conditions of all relevant consents; and
   (d) be to the satisfaction of Wellington Regional Council.

   Advice note: Being to the satisfaction of the Wellington Regional Council means that the management plan shall be confirmed in writing by the Wellington Regional Council as containing all the requirements as specified in the conditions, including level of detail of what is to be included in the plan.

Review & Charges

6. The Wellington Regional Council may review any or all conditions of this consent by giving notice of its intention to do so in accordance with Section 128 of the Resource Management Act 1991 at any time within three months of 30 June for each year for the term of this consent to deal with any adverse effects on the receiving environment which may arise from the exercise of this permit and which it is appropriate to deal with at a later stage.

7. The Wellington Regional Council shall be entitled to recover from the consent holder the costs of the conduct of any review, calculated in accordance with and limited to that Council's scale of charge in force and applicable at that time pursuant to Section 36 of the Resource Management Act 1991.

8. A resource management charge, set in accordance with Section 36(2) of the Resource Management Act 1991 shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of resource consents and for the execution of its functions under Section 35 (duty to gather information, monitor and keep records) of the Act.

Schedule 2 Specific Resource Consent Conditions

WAR 090066 (27170) - Discharge permit to discharge sediment-laden stormwater to the Ruamahanga River and Makoura Stream arising from bulk earthworks.

This permit shall be exercised subject to the following conditions together with those conditions specified in Schedule 1: General Conditions.

1. The discharge shall be only stormwater from earthworks associated with the construction of the Masterton Wastewater Treatment Plant and Disposal System Long-Term Upgrade.

2. The consent holder shall submit, at least one month prior to the commencement of construction activities, an Erosion and Sediment Control Plan outlining the construction activities and all practices and procedures to be adopted in the construction of the Masterton Wastewater Treatment Plant and Disposal System Long-Term Upgrade.

   The Erosion and Sediment Control Plan (ESCP) shall be prepared in accordance with Greater Wellington's Erosion and Sediment Control Guideline 2002, and shall:

   (a) Clearly define the sediment and erosion control measures to be implemented for each stage of the works. The Plan shall include, but not be limited to:

   ~~i.~~(i) a locality map detailing as a minimum the location of roads, property boundaries, surface waterways, the direction of stormwater flows, and the erosion and sediment and control devices;

   ~~ii.~~(ii) a detailed programme of works identifying:

   ~~(a)~~(a) each stage of construction;

   ~~(b)~~(b) an estimate of the maximum area of bare ground (cumulative total) exposed at each stage of construction;

   ~~(c)~~(c) the volume of earthworks proposed.

   ~~iii.~~(iii) drawings and specifications of all designated erosion and sediment control measures selected from the Erosion and Sediment Control Guidelines, including contingency measures, on-site catchment boundaries, and off-site sources of runoff

   ~~iv.~~(iv) a programme for managing exposed areas including progressive stabilisation and minimising areas of exposed soil by:

   ~~(a)~~(a) ensuring that any earthworks and/or vegetation clearance should where practicable, be limited to the footprint of the works; and

   ~~(b)~~(b) staging of the construction.

   ~~v.~~(v) A schedule outlining the frequency and methods of inspection, monitoring and maintenance of all erosion and sediment control measures.

   ~~vi.~~(vi) Details of any proposed monitoring as is adequate to demonstrate the effectiveness of the proposed measures.

3. The Erosion and Sediment Control Plan may be amended at any time during the construction phase. Any amendments shall be:

   (a) only for the purpose of improving the efficiency of the erosion and sediment control measures and shall not result in reduced discharge quality into the receiving environment;

(b) consistent with the conditions of this resource consent; and
(c) submitted in writing to the Manager, Environmental Regulation, Wellington Regional Council, prior to any amendment being implemented.

4. All erosion and sediment control measures shall be installed prior to the commencement of any earthworks, for each stage.

5. All erosion and sediment control measures shall remain the responsibility of the permit holder, and be installed, operated and maintained efficiently and in accordance with Wellington Regional Council's Erosion and Sediment Control Guidelines for the Wellington Region (dated September 2002), and to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council.

6. The permit holder shall ensure that the site is audited by an appropriately qualified person on a monthly basis to ensure that the erosion and sediment control methods are being maintained in accordance with the Erosion and Sediment Control Plan.

7. The monthly audits of site with respect to the Erosion and Sediment Control Plan as required by condition 6 shall include, but not be limited to, the following information:
   - Date;
   - Name of auditor;
   - Site condition;
   - Weather conditions;
   - Sediment management (identification of areas of potential sediment generation and review of sediment control measures);
   - Runoff control;
   - Condition of sediment control measures, including silt fences, contour drains and sediment retention ponds;
   - Maintenance required and the date this will be completed by; and
   - General comments.

   The results of the monthly audits as required by condition 6 shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council on request.

8. Where the discharge of stormwater enters any surface watercourse, the discharge after [specify distance downstream] for the Ruamahanga River, shall not result in:
   ~~(a)~~(a) any visible oil, grease films, scums or foams, or floatable materials; or
   ~~(b)~~(b) any conspicuous change in colour or clarity.

WAR 090066 (27171) - Discharge permit to discharge any treated wastewater and groundwater to water arising from dewatering processes at various locations.

Note: Other conditions might be required following clarification sought.

This permit shall be exercised subject to the following conditions together with those conditions specified in Schedule 1: General Conditions.

Discharge quality and quantity limits

1. The discharge of treated wastewater from the dewatering process to Makoura Stream shall not exceed 200 litres per second.

2. The discharge of treated wastewater from the dewatering process to Makoura Stream shall not exceed the following standards:

Parameter	Unit	Standard (Maximum)
E. coli	cfu/100 ml	1200
BOD_5	g/m^3	32
Suspended Solids	g/m^3	42
Total Nitrogen	g/m^3	13
Ammonia-N	g/m^3	7.0
Total Phosphorus	g/m^3	3.3

Notification of dewatering

3. In addition to general condition 1, the permit holder shall notify the Manager, Environmental Regulation, Wellington Regional Council no later than 12 hours prior to any pumping of water from the existing ponds to the Makoura Stream. The consent holder shall also notify within 24 hours of the discharge ceasing.

Keeping of records

4. The permit holder shall keep a record of the dates, times and volumes of all pumping from the existing wastewater ponds to the Makoura Stream. The records shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council on request.

WAR 090066 (27172) - Water permit to divert and take groundwater arising from dewatering processes from cut-off and drainage trenches during construction activities.

This permit shall be exercised subject to the following conditions together with those conditions specified in Schedule 1: General Conditions.

1. The consent holder shall submit to the Manager, Environmental Regulation, Wellington Regional Council, at least one month prior to the commencement of construction activities a Dewatering Management Plan outlining the dewatering activities, practices and procedures to be adopted in the construction of the Masterton Wastewater Treatment Plant and Disposal System Long-Term Upgrade.

   The dewatering management plan will includes details of:
   (a) the extent of construction activities in relation to the areas where dewatering will be required;
   (b) the types of dewatering methods to be adopted and details of where water will be directed and disposed of;
   (c) a programme including timetable, sequence of events and duration;
   (d) mitigation measures to be adopted; and
   (e) contact details for the person in charge of site works.