

Renewal of Martinborough Wastewater Treatment Plant (MWWTP) Consents

Brian Coffey revised 03 November 2015 [and reviewed by Olivier Ausseil 16 December 2015](#)

Arising from the hearing on 3 June 2015, the Commissioners asked me to attend to the three following matters.

- Draft Condition of consent to cover concern with stock access to potentially contaminated treated wastewater during and following the proposed MWWTP upgrades.
- Draft an appropriate Condition of Consent for the recommended dye dispersion study during Stage 1B of the MWWTP upgrade
- Comment on the implications of the engineered high flow back channel recently constructed downstream of the MWWTP, on my Evidence in Chief as tabled.

1. Draft condition(s) of consent to cover concern with stock access to oxidation pond effluent during Stage 1A and 1B of the MWWTP upgrade.

Note: the GWRC Regional Policy Statement discourages stock access to streams, rivers and wetlands to protect aquatic habitat and in Schedule 1 - General Conditions of the staff report under access, proposed conditions 25 and 26 are as follow.

- 25 The access gate to the site shall remain locked at all times that operational staff of the consent holder (which shall include authorised contractors) are not present on site, to prevent unauthorised access.
- 26 Stock access to the WWTP oxidation ponds and discharge channel shall be restricted, except that grazing of the embankment by stock shall be permitted under the management of the Consent Holder. All fences or other barriers shall be maintained by the consent holder to be of suitable stock proof standard at all times.

It is recommended that Conditions 26A, 26B and 26C as follow, are added to the consent conditions to prevent stock access to potentially contaminated oxidation pond liquor.

- 26A Fencing shall exclude stock access to the left bank of the Ruamahanga River between the MWWTP and the western side of the natural high flow channel to the west of the MWWTP (as shown in Figure a) for the duration of Stages 1A, 1B and 2A.
- 26B Stock water shall not been drawn from the Ruamahanga River between the MWWTP and the western side of the natural high flow channel to the west of the MWWTP (as shown in Figure a) for the duration of Stages 1A, 1B and 2A.
- 26C Fencing shall exclude stock access to additional storage pond(s) for treated wastewater following the commissioning of the Stage 2B upgrade of the MWWTP.

2. Draft an appropriate Condition of Consent for the recommended dye dispersion study during Stage 1B of the MWWTP upgrade.

Note: recommended Condition 8 under Schedule 2 (Stage 1B mixing zone investigation): of the staff report is as follows.

- 8 Within **three months** of commencement of Stage 1B, the consent holder shall develop a Monitoring Protocol to characterise the effects and mixing of the discharge with river water and river health in a distance of 500m downstream of the discharge in a range of river and wastewater flow conditions relevant to Stage (1B). As a minimum, the survey shall be carried out in both winter and summer conditions, and include sampling during maximum wastewater discharge flows proposed for Stage 1B at no less than three river flows, including at river flow

at or close to half median flows on at least one sampling occasion and include monitoring of periphyton growth, macroinvertebrate communities, Ammoniacal-N, DO, DRP, and BOD. Periphyton and macroinvertebrate communities shall follow the protocols and methodologies set in Schedule 2: conditions 12 and 13 of this consent. At minimum, sampling should be undertaken at the upstream site and the two downstream monitoring sites, as shown on Plan XXX. The Monitoring Protocol shall be developed in consultation with a water quality expert appointed by the Manager, Environmental Regulation, Wellington Regional Council, and approved by the Manager, Environmental Regulation, Wellington Regional Council, prior to the monitoring taking place.

It is recommended that Conditions 8A, 8B, 8C and 8D as follow, are added to the consent conditions to complement the river mixing study.

~~8A The Monitoring Protocol to characterise mixing of the discharge with river water and river health during Stage 1B of the proposed MWWTP upgrade shall include a dye dispersion study using Rhodamine Water Tracer (WT), a fluorescent red non-toxic dye¹, at approximately half median river flow (25 cumecs) and median flow (50 cumecs) across four transects of the river between the MWWTP discharge and a distance of 500 m downstream of the MWWTP discharge. Stream depth shall be measured at one metre intervals across each transect to plot a cross sectional profile for each of these three transects.~~

~~8B Detailed methodology for the dye dispersion study shall be agreed to in the Environmental Monitoring Plan referred to in Condition 6, Schedule 1, of the staff report. However, as a minimum, sampling of dye concentrations shall be at two depths (0.3 and 0.9 of river depth) and at distance of 5%, 50%, and 95% across each transect. The time of sampling at each of the three downstream transects shall occur when the third of five instream drouges released from the discharge from the MWWTP² arrives at each transect.~~

~~8C Longitudinal dispersion of dye shall be calculated by difference in total concentration of dye at any given transect relative to release quantity. Horizontal and vertical differences in dye concentration shall be used to calculate the extent of wastewater mixing across each transect. Dye concentrations in each water sample shall be measured with a spectrophotometer (1 cm path length) and compared to a standardised dilution graph of the same batch of dye diluted with river water from the study site which was collected at the time of the mixing study.~~

8A If ecological monitoring required in Condition 8 showed there was no significant adverse effect at the first downstream monitoring sites, as shown on Plan XXX 500 m downstream of the discharge following Upgrade Stage 1B (i.e. there is less than a 20% reduction in QMCI), no further investigation into the mixing zone shall be required.

8B If ecological monitoring required in Condition 8 showed there was a significant adverse effect at the first downstream monitoring sites, as shown on Plan XXX 500 m downstream of the discharge during following Upgrade Stage 1B (i.e. there is more than a 20% reduction in QMCI), then the discharge point from the MWWTP shall be relocated immediately downstream of the water intake structure in the Ruamahanga River abeam of the MWWTP and the ecological monitoring shall be repeated.

8C If ecological monitoring required in Condition 8B (following the re-location of the discharge point for the MWWTP) showed there was no significant adverse effect at the first downstream monitoring sites, as shown on Plan XXX 500 m downstream of the discharge (i.e. there is less than a 20% reduction in QMCI), no further investigation into the mixing zone shall be required.

8D If ecological monitoring required in Condition 8B (following the re-location of the discharge point for the MWWTP) showed there continued to be a significant adverse effect at the first downstream monitoring sites, as shown on Plan XXX 500 m downstream of the discharge (i.e. there is less than a 20% reduction in QMCI), further investigation into the mixing zone shall be

¹ Or alternative material approved by the GWRC).

² At the same time a finite amount of dye is added to the discharge from the MWWTP.

required. This would involve a dye study that would be to the satisfaction of the Greater Wellington Regional Council.

3. Comment on the implications of the engineered high flow back channel recently constructed downstream of the MWWTP.

It is understood that only greater than normal river flows (i.e. >50 cumecs as measured at Waihenga) will enter the engineered high flow back channel on the left bank of the Ruamahanga River as shown in Figure A.

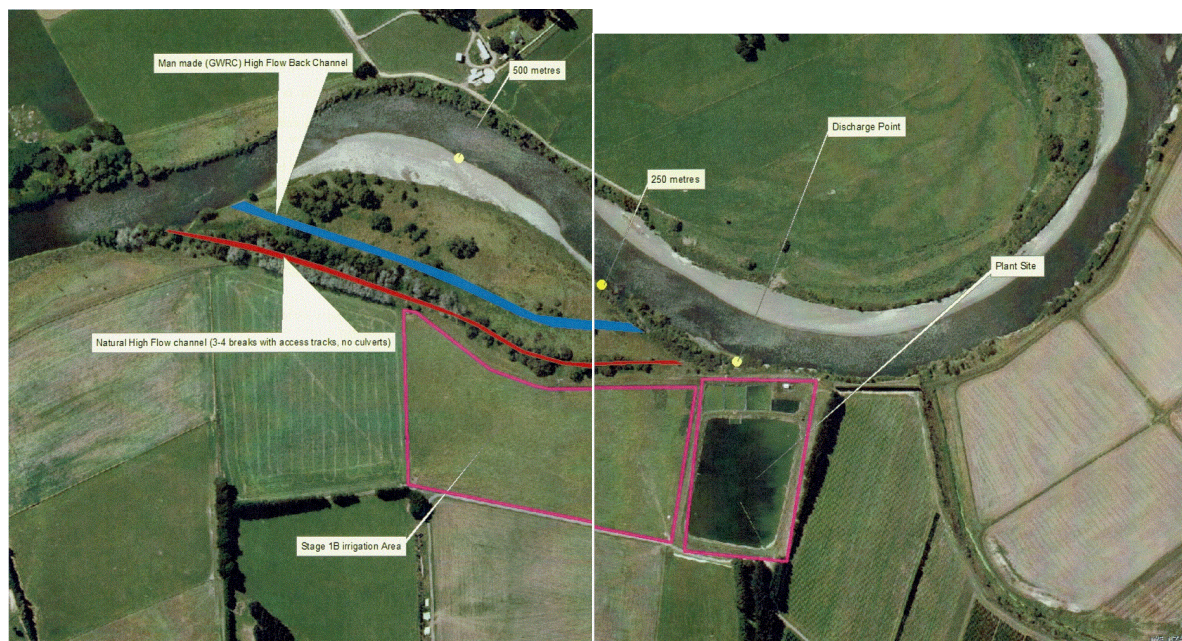
No river discharge from the MWWTP is expected during Stage 1B and Stage 2A upgrades when flow in the Ruamahanga River at Waihenga is less than half median flow (< 25 cumecs).

However, a proportion of any discharge from the MWWTP to the Ruamahanga River that occurs at river flows in excess of 50 cumecs may be entrained in the engineered high flow back channel and enter the Ruamahanga River downstream of the 500 m site shown in Figure A.

Indeed, given the locality of the intake for the engineered high flow back channel, most of the discharge from the MWWTP to the Ruamahanga River that occurs at river flows in excess of 50 cumecs would be expected to enter the engineered high flow back channel and discharge to the Ruamahanga River downstream of the 500 m site shown in Figure A.

The worst case scenario for river discharges from the MWWTP expected during Stage 1B and Stage 2A upgrades will be for river flows between half median and median river flows (25 to 50 cumecs) and these effects can be measured in the mainstem of the river when no flow will be diverted through the engineered high flow back channel.

Figure A: *Engineered High Flow Back Channel that has recently been constructed downstream of the MWWTP by Greater Wellington Regional Council.*



If, as expected, the proposed river monitoring programme following the Stage 1B upgrade showed no significant adverse instream effects of the half median to median flow discharges that did occur from the MWWTP, no further concern would exist for MWWTP river discharges that occurred at river flows above median flow that might enter the engineered high flow back channel.

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Conversely, if there were significant adverse effects associated with half median to median flow discharges from the MWWTP that did occur following the Stage 1B upgrade, the requirement for post Stage 1B instream monitoring could be re-visited at that time.