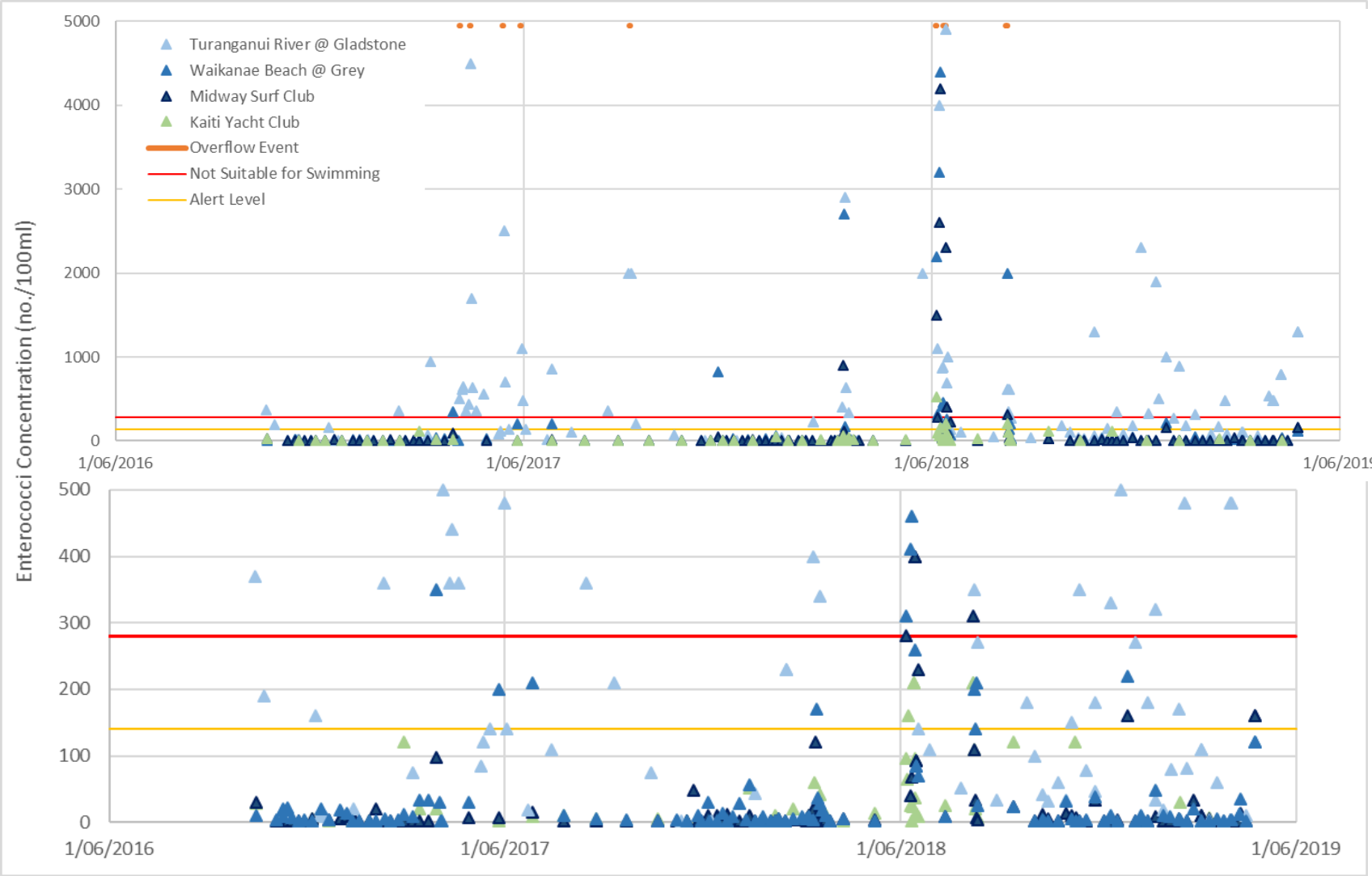

Figure 20: Microbial Water Quality Monitoring in the Bay

Data sourced from Land Air Water Aotearoa

5.6 Public Use and Associated Activities

Gisborne's rivers and beaches are extremely popular and used by a range of people all year-round. Common recreational activities including surfing, swimming, waka ama, rowing, kayaking and fishing. Public access to the rivers is affected by urbanisation, but it is generally good in the lower reaches of the Taruheru River (Figure 21) and jumping into the rivers from the city's bridges is also a common summertime activity. Access is good from a sporting perspective, but changes to the riparian margins mean that public access to the water body is limited to dedicated access points. Tangata whenua have expressed concern over traditional access, with this having been affected by land ownership and transformation of the river banks.

Figure 21: Lower Reaches of the Taruheru River, near the Confluence with the Waimata River

Waka ama storage and river access is located on the far side of the river

The following rivers, which have the potential to be affected by wastewater overflows, are identified in Schedule G19 of the TRMP as Significant Swimming and Recreation areas:

Table 17: Summary of Significant Swimming and Recreation Areas (Source: G19 of the TRMP)

Catchment	River	Location
Taruheru	Taruheru River	The length of the river between the Wi Pere Bridge and the confluence with the Waimata River
Waimata	Waimata River	The length of the river between the island and the confluence with the Taruheru River
		Waimata River (Scout Camp)
Tūranganui	Tūranganui River	Gladstone Road Bridge to the Railway Bridge
Wainui	Wainui Stream	River Mouth

5.7 Sites of Cultural Significance

It is acknowledged that there are multiple sites within Gisborne City that are of significance to tangata whenua. These include both mapped and un-mapped sites.

Under the TRMP, the lower reaches of the Taruheru River and Waimata River, and Tūranganui River is a mapped Waahi Tapu Area (WY8) as is the Waikanae Stream (WY9). Much of the city is also subject to a "Heritage Alert Overlay" and multiple historic heritage and archaeological sites.

The freshwater and coastal bodies are also subject to a number of statutory acknowledgments, as shown in Figure 22.

The significance of Poverty Bay to Ngāti Porou (and associated hapū) is also recognised through the Ngā Rohe Moana o Ngā Hapū o Ngāti Porou Act 2019. Their rohe recognised under this Act is shown in Figure 23.

It is also acknowledged that there are a number of other iwi and hapū that may be affected by wastewater overflows.

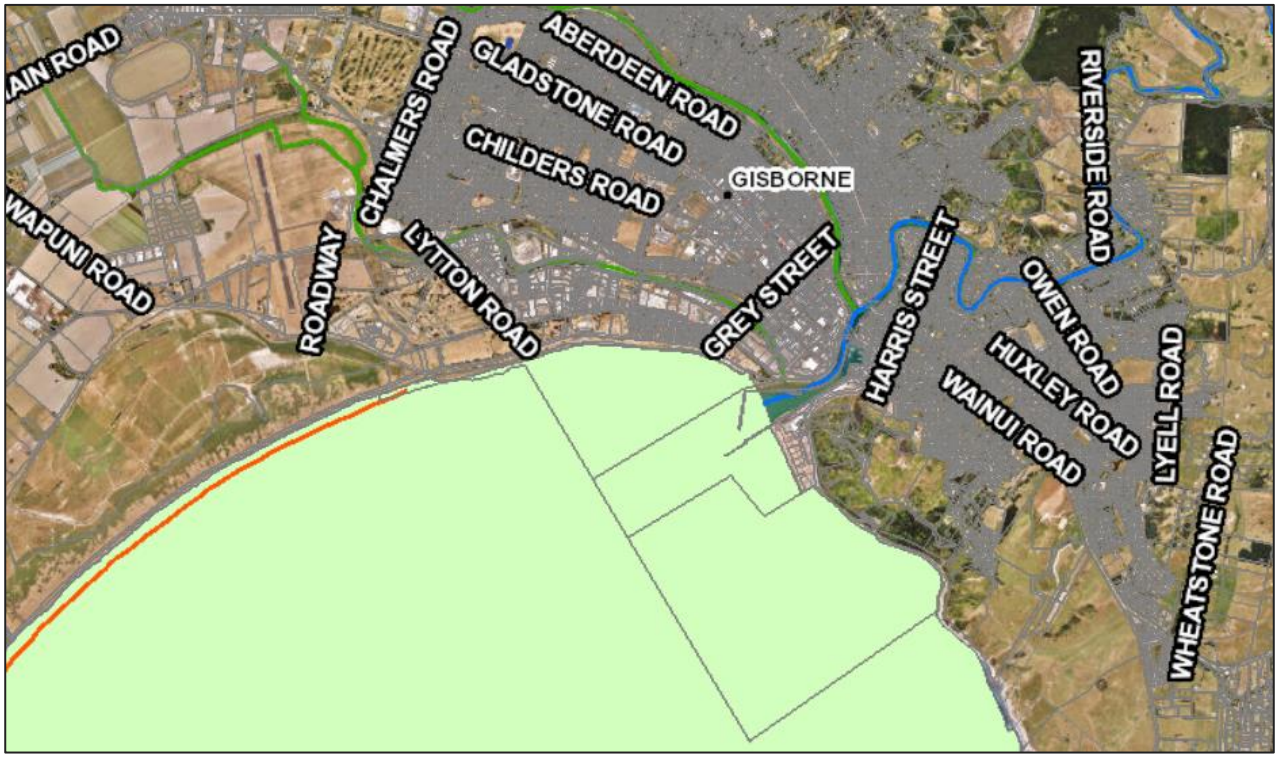

Figure 22: Statutory Acknowledgements Shown on Tairāwhiti Maps

Figure 23: Map of ngā rohe moana o ngā hapū o Ngāti Porou

6 ASSESSMENT OF ENVIRONMENTAL EFFECTS

6.1 Introduction

A range of technical studies, assessments, and engagement processes have been undertaken to understand the effects of wastewater overflows, both at the current time and in the future following the success of the DrainWise Programme. The DrainWise Programme forms a key element of the resource consent application and will be implemented by the Stormwater and Wastewater Teams at GDC.

Studies undertaken as part of this consent application include:

- Hydrodynamic modelling of the dispersion of contaminants within Gisborne's rivers and the Bay under a range of meteorological (rainfall, wind, tide) conditions;
- An assessment of the effects of overflows on water quality in the rivers and immediate coastal environment, based on a significant monitoring programme implemented by Council;
- As assessment of effects on the ecological health of the estuarine systems;
- A Heath Risk Assessment (HRA) associated with contact recreation activities and consumption of raw harvested shellfish; and
- Ecological risks associated with the discharge of Emerging Organic Contaminants (EOCs) that may be present in wastewater overflows.

In addition, the KIWA Group has also been engaged in a technical Mātauranga Māori sense, as representatives of particular iwi and hapū, for their expert cultural input and guidance. In respect of the cultural effects of wastewater overflows, these have been assessed and described by the KIWA Group through a people-centred approach, consideration of wastewater overflows with a Te Ao Māori lens, enabling information to be gathered and analysed through debate and discussion within and between iwi / hapū, and the use of assessment tools. A summary of these studies and processes, and their key conclusions, are presented in subsequent sections of this AEE report.

6.2 The Requirement for a Wastewater System

An effective and efficient wastewater network is fundamental and essential infrastructure in an urban environment and an element of all towns and cities. This includes the transport of the wastewater from homes, commercial premises and other facilities for treatment and disposal. As discussed in Section 2.1, Gisborne's wastewater network has expanded and been significantly improved over time to meet the needs of a growing city and changing community and cultural expectations, with the next stage of the WWTP upgrade currently under design. As with all wastewater (and drainage) networks, this continual process of expansion and improvement is on-going.

All wastewater systems include the provision for overflow relief – it is a part of the design of systems to protect them from excessive flows and to enable overflow discharges to be controlled rather than occur in an uncontrolled and potentially random manner. In addition, all wastewater networks are subject to occasional failure and blockages and dry weather overflow events are unpredictable and unavoidable. Resolving these failures and blockages as efficiently as possible is a common issue faced by all territorial authorities.

6.3 Growth

Growth has the potential to exacerbate existing overflow issues, by increasing the wastewater flows and stormwater runoff.

The estimated population of the district is 47,900, which equates to 1% of New Zealand's total population. Gisborne has the lowest ratio of population to land area of all North Island regions and the fifth-lowest of New Zealand's 16 regions. Three quarters of the population lives in Gisborne City, which had an estimated population of 36,100 in 2016. The district's population is forecast to grow by almost 1,500 persons (3%); from 47,900 in 2018 to 49,390 in 2028. By 2043 the forecasted population is 52,065; a growth of 4,170 persons (8.7%) over 25 years[29]. Council aims to ensure that activities that stimulate the need for infrastructure growth (particularly where this is an extension of Council's infrastructure footprint) bear the costs of that growth.

In respect of economic growth, Gisborne has seen substantial growth in recent times and was the top ranked region in New Zealand for economic growth for the last three quarters of 2019 region[30]. This was primarily due to a buoyant house market, strong retail and construction sectors (also nation leading for growth) and a diverse mix of export industries.

6.4 Public Amenity and Visual Impact

6.4.1 Public Amenity

Gisborne's waterways are highly valued by its community and water sports form an integral part of recreation for the Gisborne community, being part of the identity of the city. In addition to the social and cultural concerns regarding the discharge of wastewater overflows to rivers can impact on public amenity in several ways:

- Dry weather overflows that reach water can reduce the appeal of small waterways and cause temporary odour nuisance. Due to their relatively small scale, they are less likely to affect larger rivers that have a large water flow due to dilution.
- Wet weather overflows can affect public amenity and use of receiving environments both during, and following, an overflow event. Wet weather overflows typically involve substantially larger discharge volumes than those in dry weather and are more extensive in their extent and effects.

6.4.2 Visual Impacts

Dry weather overflow can cause a visual impact on receiving waters. This can include:

- Discolouration of water at the point of discharge – this is most likely to occur is small streams subject to a dry weather overflow. Wet-weather overflows occur during times of very heavy rain, when river flows contain a large amount of sediment from up-catchment sources;

[29] LTP 2018-2028

[30] ASB Regional Economic Scorecard, December 2019

- Material (fat, solids, litter) left in waterways and vegetation following an overflow event (both dry and wet weather).

Mitigation for these potential effects include prompt response to dry weather overflows and post-event clean-up of any visual material. Additionally, the measures proposed to reduce the frequency and volume of overflows will reduce the frequency at which these impacts occur. Dry weather overflows are proposed to be managed through best practice to keep them to a practicable minimum.

6.5 Water Quality Monitoring

Council undertook monitoring of water quality in Gisborne's main rivers during and following seven overflow events between April 2017 and June 2018. Analysis of the data from this sampling is provided in Appendix I and a summary of this report is provided below[31].

6.5.1 Monitored Overflow Events

The seven events occurred as follows:

Overflow 1: 4 April 2017 to 5 April 2017 (8 overflow points)

Overflow 2: 13 April 2017 to 14 April 2017 (5 overflow point)

Overflow 3: 12 May 2017 to 13 May 2017 (3 overflow points)

Overflow 4: 28 May 2017 (2 overflow points)

Overflow 5: 3 September 2017 (1 overflow point)

Overflow 6: 4 June 2018 (2 overflow points)

Overflow 7: 11 June 2018 (6 overflow points)

A heavy 'rainfall only' event was also sampled from 12 to 18 March 2018, to assess river and estuarine water quality during heavy rain, but in the absence of an overflow.

The overflow points, durations and locations are provided in Appendix I. The maximum duration of an overflow was 48 hours during the 11 June 2018 event. For the other overflow events, overflow durations ranged from 11–26 hours in length.

6.5.2 Monitoring Locations

Monitoring was conducted at 15 sites within the Gisborne city (see Figure 18). These 15 monitoring sites were separated into 12 river sites or 'in-stream' sites, and three network sites ('in-pipe' sites).

Each stream (where possible) was sampled upstream (out of the potential effects of the overflow and tidal influence) as well as at various locations down the length of the stream and down to the coast to characterise the quality of the river prior to it entering the urban area potentially affected by overflows. In

[31] Section 5 includes a summary of the report as it relates to background water quality in the rivers.

addition to the main streams potentially affected by overflows discussed above, two sites were located on the Waikanae Stream. These Waikanae Stream sites were monitored to assess the effects of overflows to the stream (should any occur), and to provide an indication of the effects of urban stormwater discharge on the stream in the absence of an overflow event. As there were no overflows to the Waikanae Stream during the monitoring period, the results for this stream indicate contaminants such as metals, nutrients and bacteria from non-wastewater overflow sources within the catchment.

The three network sites were monitored with samples collected from within the wastewater pipe itself (during heavy rain) to characterise the quality of stormwater-diluted wastewater prior to discharge.

6.5.3 Monitoring Parameters

An extended suite of parameters was initially monitored (in the first four overflow events) to gain a robust and broad understanding of the potential effects on the receiving environment. Subsequent monitoring focussed ion microbial contaminants. Accordingly, a large quantity of monitoring data was received and while all information was considered, the assessment was focussed on the following key parameters:

Nutrients	Total Phosphorus, Total Nitrogen, Ammonia
Bacteria	Enterococci
Heavy metals	Copper (dissolved) and Zinc (dissolved)
Inorganic compounds	Fluoride
Physiochemical parameters	Total Suspended Solids (TSS)

6.5.4 Monitoring Frequency

Water quality sampling was undertaken at all in-stream sampling locations prior to an overflow event occurring (when significant rainfall was predicted), at various intervals during the overflow event, and at intervals following the end of the overflow event. This provides information on antecedent conditions, changes through an event, and the time taken for contaminant concentration to revert to background levels following valve closure.

Following the first overflow event, additional, more frequent (3 hourly for 12 hours) monitoring was undertake for monitoring sites in the Taruheru River. The purpose of this more frequent monitoring was to assess any potential influence of tidal cycles on the concentration and distribution of contaminants and the time taken for concentrations to return to background levels.

6.5.5 Monitoring Results

Wastewater overflow discharges add to the contaminant loads that are already carried in the rivers during heavy rainfall events. The assessment of the impacts of these discharges are complicated by a range of factors including: rainfall events causing overflows were different in magnitude and hence background contaminant concentrations were different, each overflow event involved overflows from a different combination of locations (some rivers were not affected by overflows in some events) and

different overflow volumes; and different timing of sampling across events. Accordingly, the results are indicative.

Wastewater Network

Samples were collected directly from the network at three sites. Enterococci concentrations were consistently higher in the Munro Street interceptor than in the other two interceptors (Harris Street and Ormond Road). However, it is noted that the Munro Street interceptor is located to the west of the city, some distance away from the overflow locations – hence it is possible that at this location the interceptor is not full of stormwater. In contrast, both the Harris Street and Ormond Road interceptors are located in areas of high stormwater inflow and within the area where overflows typically occur. It is therefore likely that these two sites are more representative of the concentration of enterococci in overflows after substantial dilution by stormwater during and immediately after heavy rain.

The results indicate that enterococci concentrations in discharged overflows (a combination of wastewater and stormwater) are generally less than 1,000,000 CFU/100mL but can be up to 2,500,000 CFU/100mL[32] during heavy rainfall events which is about 4,000 to 7,000 times greater than the recreational water quality guidelines. However, as the overflows discharge to main rivers during time of heavy rain, contaminant loads are diluted substantially during initial mixing and subsequent dispersion.

Duration of Effects

Figure 24 shows the effect of an overflow event (11-15 May 2017) on the Taruheru River, before and following the opening of the overflow valve on the Taruheru River adjacent to the Peel Street Bridge. Other overflows on the Waimata River were also opened during this event.

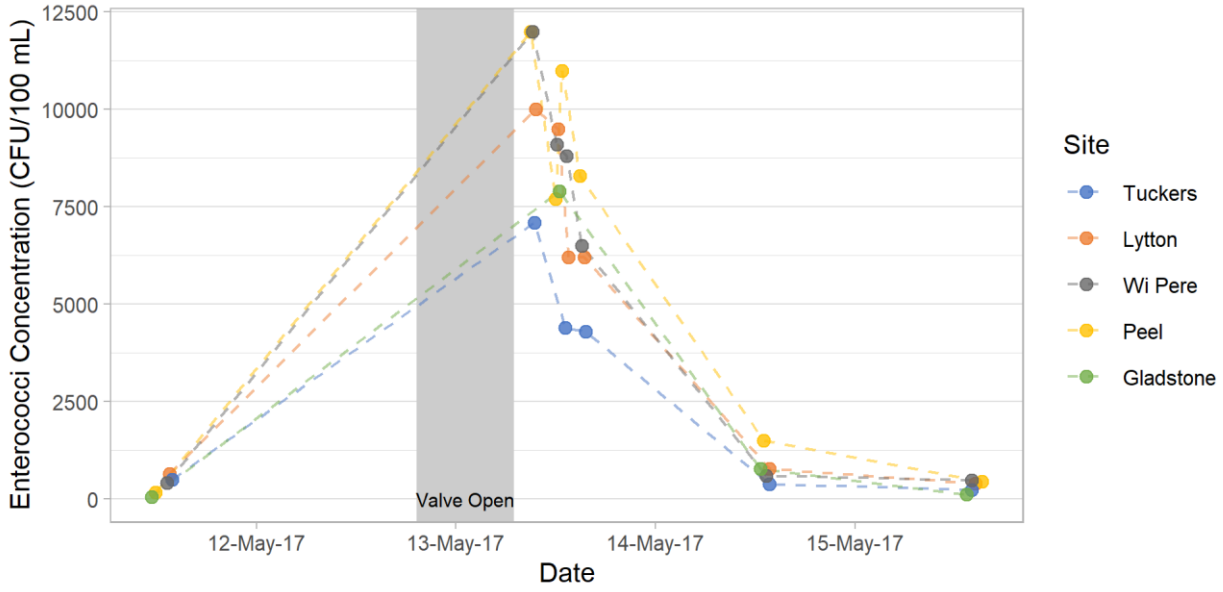

Figure 24: Enterococci Concentrations - Taruheru River, 11 – 15 May 2017

(before, during, and after a wastewater overflow event)

[32] This concentration was used as the initial starting concentration in the hydrodynamic modelling discussed below

As can be seen by the results, enterococci concentrations peaked during and immediately following the overflow event when the valve was open, with concentrations then dropping off progressively once the overflow valves had been closed, decreasing to approximately half the peak concentration within the first 24 hours, and returning to near pre-overflow concentrations within approximately 48 (or slightly longer) of the overflow valve being closed. This is consistent with the results of the hydrodynamic modelling which indicate that concentrations return to normal 48 to 72 hours following an overflow event.

Enterococci

The effect of wastewater overflows on the water quality of Gisborne urban rivers is complex because it is a factor of multiple variables including total contaminant load, the time over which the overflow valves are open, the state of the tide and wind, the amount of rainfall, and the number of overflow values open on any one river at any one time. Additionally, the true *maximum* enterococci concentration during an overflow event is likely to occur over a short period of time and there is a high chance that periodic sampling did not capture this maximum. This makes the data more difficult to interpret quantitatively. Instead, a more qualitative approach is used to capture high-level patterns and observations.

The highest enterococci concentrations recorded over the monitoring programme were measured in the lower Taruheru River, most notably during Events 1 and 2 when there were overflow discharges to the river (Figure 25). The maximum concentrations were about twice as high during these overflow events than the maximum recorded during routine (background) sampling.

Events 1 and 2 on the Taruheru River showed expected responses to overflow discharges to the lower river, whereby maximum concentrations generally increased downstream as wastewater overflows were discharged to the river. This effect was much smaller, if it occurred at all, during subsequent overflow events. This is likely due to no overflows occurring on the Taruheru River in Events 4–6. This response differs to that seen in the routine sampling and the rain only event, which showed highest enterococci concentrations in the upstream sites – as a result of wastewater inputs to the urban section of the river.

The Waimata River generally only had small elevations in enterococci concentrations during overflow events. Concentrations typically increased from upstream to downstream, indicating the contribution from wastewater overflows through the urban section of the river. Gladstone is downstream of the confluence of the Waimata and Taruheru Rivers and is, therefore, influenced by overflows from all upstream sites. There was one unusually high maximum concentration at Gladstone during Event 6. The cause of this is not clear from the data but it appears to be a ‘one-off’. It is noted that the primary overflow location for this event was Wainui Road, which is in close proximity to the Gladstone Road sampling point – although it is noted that the maximum recorded enterococci concentration downstream at the Cut for this same event was substantially lower..

The Waikanae Creek was not subject to overflows and while maximum levels were elevated (typically 5,000 to 20,000 CFU/100mL), they were similar to (and in some cases less) than those observed in routine monitoring. While the Cut is located at the mouth of the Waikanae Creek, it is also influenced by overflows from all upstream sites and hence isn’t reflective of water quality within the Waikanae Creek.

Hirini on the Kopuawhakapata Stream had consistently high enterococci concentrations even though it only received wastewater overflows during Events 1 and 2. This may indicate the presence of illegal cross-connections of private wastewater pipes to the stormwater network, or other microbial sources, which would provide a constant source of contamination into the receiving environment.

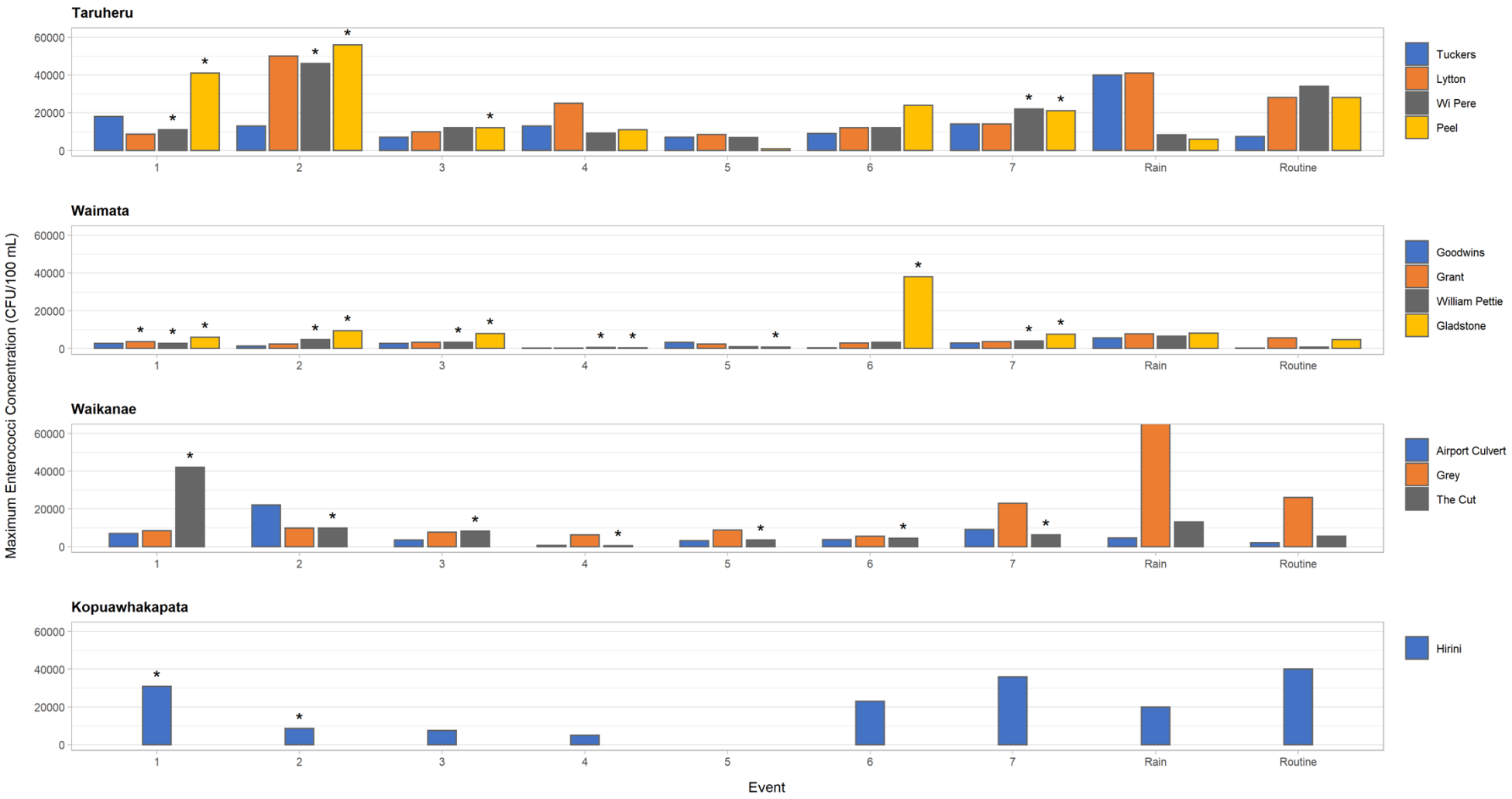

Figure 25: Maximum enterococci concentrations during wastewater overflow events (1–7), a rain-only event and routine sampling

A star indicates that a wastewater overflow was nearby or upstream of the monitoring location. Note there were no measurements in the Kopuawhakapata Stream during Event 5. See Figure 18 *for sampling site locations*

Nutrients (Figure 26 and Figure 27)

- In general, nutrient concentrations were highest in the upper catchment of the Taruheru, indicating that the catchment is the dominant source. However, overflows in the lower catchment appear to sustain the elevated levels down the river, rather than the declining downstream trend observed in the routine monitoring (absent of overflows) (particularly for nitrogen and to a lesser extent phosphorus in the Taruheru River).
- Wastewater overflows are likely to increase the nitrogen and phosphorus levels in Gisborne urban rivers, as the concentration in the overflow discharge is higher than that in river flows from the upstream catchment. The overflows therefore add to the typical background source of nitrogen from up-catchment, reducing the dilution effect that would otherwise occur through the urban area.
- However, background total nitrogen levels are substantially above the ANZG (2018) 80th percentile guideline value for Warm Dry Low-elevation rivers (0.281 g/m3). The short period over which nitrogen and phosphorus is elevated due to wastewater overflows is unlikely to add substantially to existing effects, and will reduce substantially following the implementation of the DrainWise programme.

Ammonia (Toxicity) (Figure 28)

- Maximum ammonia concentrations in river water at all locations during all overflow events were substantially below the Gisborne Urban Freshwater Management Unit median guideline (1.3 g/m^3).
- The low concentrations measured during overflow events indicate that ammonia toxicity is not a concern in the monitored rivers. The contribution of ammonia from wastewater overflows is appears to be low and very unlikely to cause toxicity-related effects on aquatic organisms.

Total Suspended Solids (Figure 29)

- In general, wastewater overflows are likely to have a minor (if noticeable) contribution to river TSS concentrations during overflow events. Wet weather wastewater TSS concentrations, measured 'in-pipe', are at a similar level to, or below, river TSS concentrations particularly in the Waimata River.
- TSS concentrations were notably elevated on the Waimata River during the sampled during the rainfall/overflow events. However, these were highest in the upper catchment, indicating the catchment to be the dominant source during heavy rain. There was no evidence of any significant input from wastewater overflows and urban stormwater. This is not surprising given the large size of the catchment compared to the urban area, and the known dominant effect of TSS from agricultural runoff.

Metals (Figure 30 and Figure 31)

- Results for copper (dissolved) and zinc (dissolved) were often below the analytical level of detection, indicating the generally low concentrations of dissolved metals in river waters.
- Metal concentrations were below (less than) the guideline value for the 80% protection of species most of the time. These are chronic guideline values and hence the overall risk to aquatic species from episodic rain (and even less frequent overflow) events is likely to be low considering the short period they are elevated (<24–48 hours). Given the primary source of metals is likely to be from stormwater component, rather than wastewater, wastewater overflows are likely to have a very small to negligible effect on in-stream chronic or long-term copper concentrations.

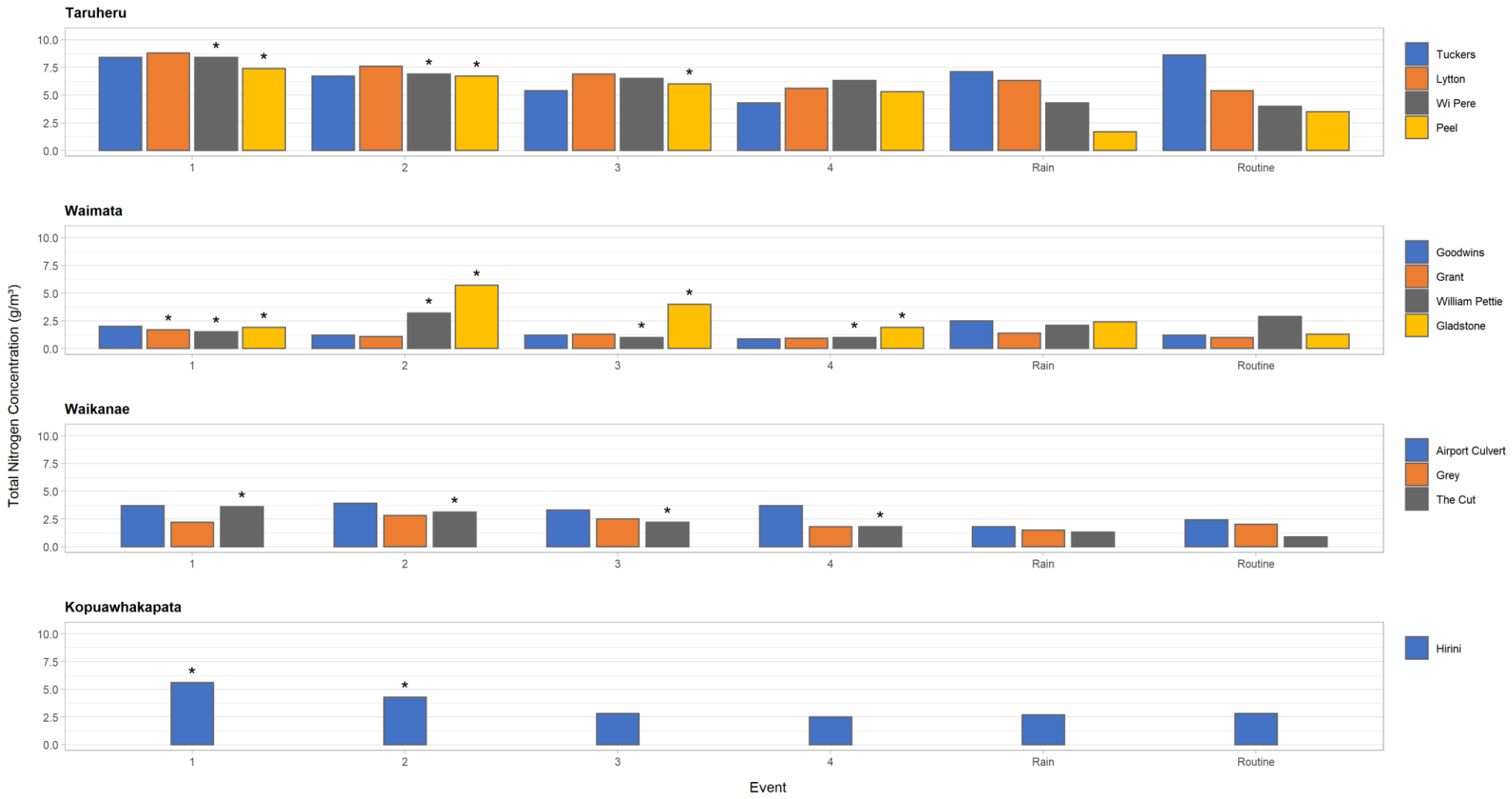

Figure 26: Maximum total nitrogen concentrations during wastewater overflow events (1–4), a rainfall only event and routine sampling

(A star indicates that a wastewater overflow was nearby or upstream of the monitoring location)

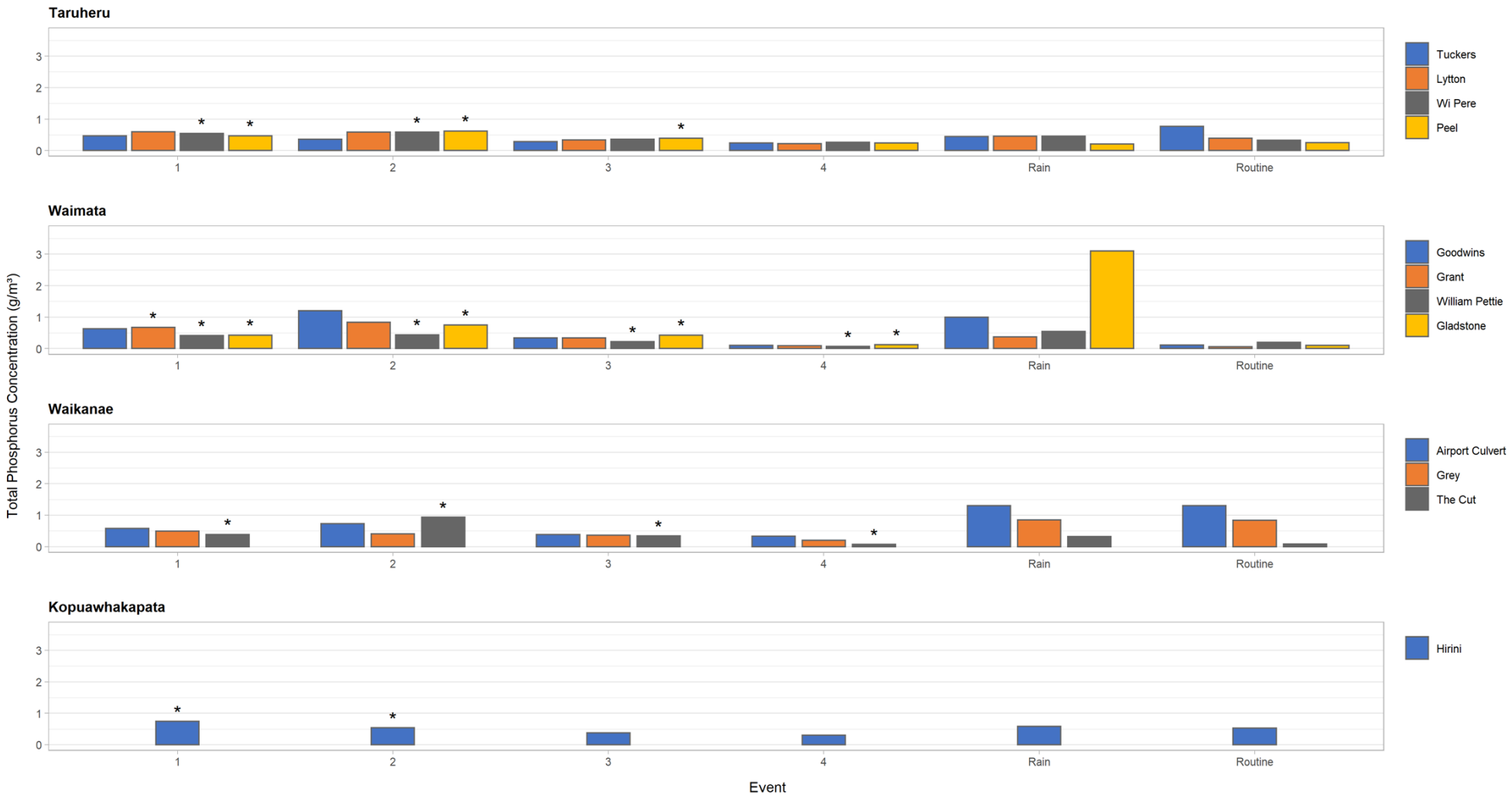

Figure 27: Maximum total phosphorus concentrations during wastewater overflow events (1–4), a rainfall only event, and routine sampling

(A star indicates that a wastewater overflow was nearby or upstream of the monitoring location)

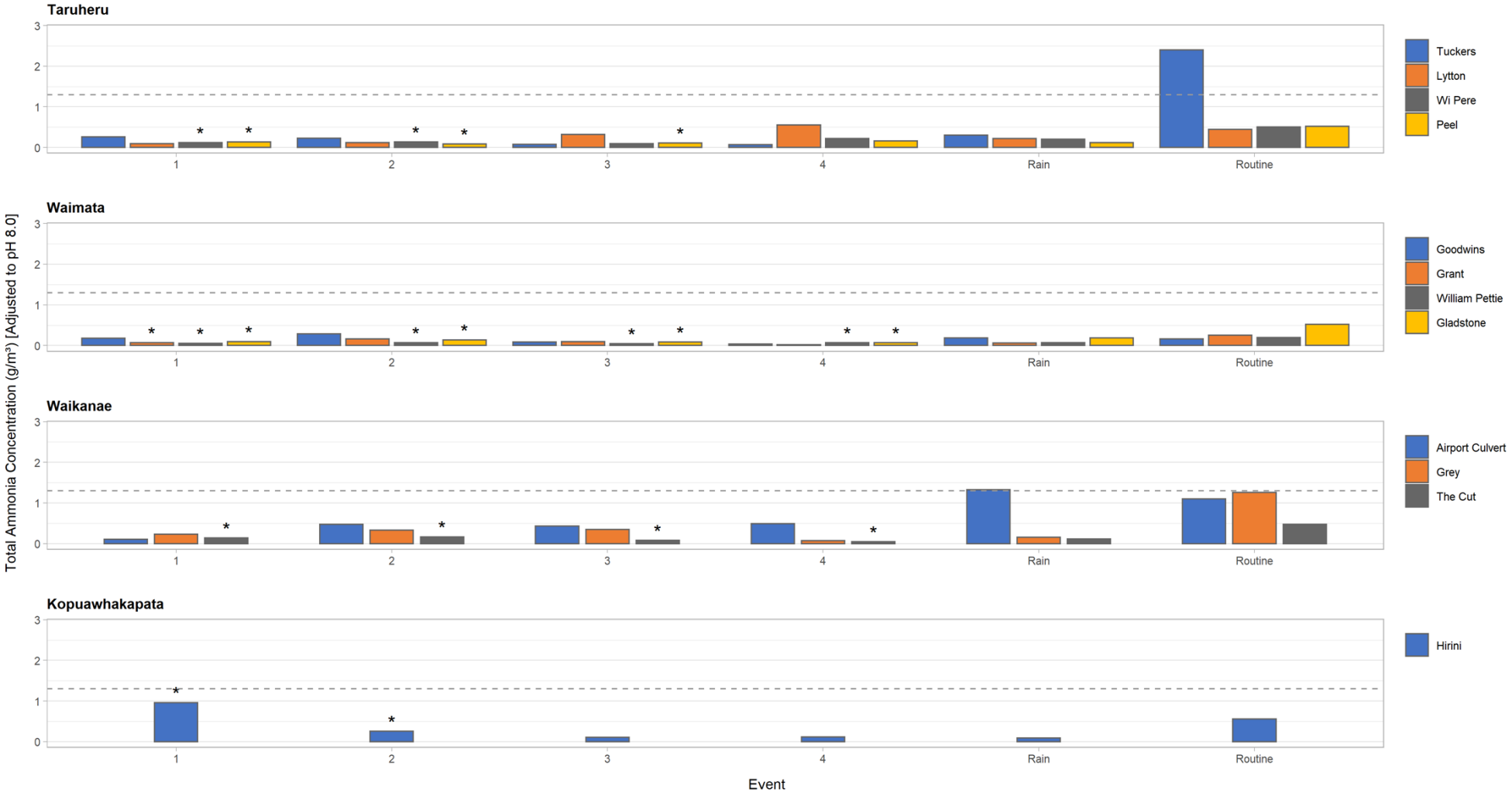

Figure 28: Maximum ammonia concentrations (adjusted to pH 8.0) during wastewater overflow events (1–4), a rainfall only event, and routine sampling

(A star indicates that a wastewater overflow was nearby or upstream of the monitoring location. The horizontal dashed line denotes the Gisborne Urban Freshwater Management Unit median guideline of 1.3 g/m3)

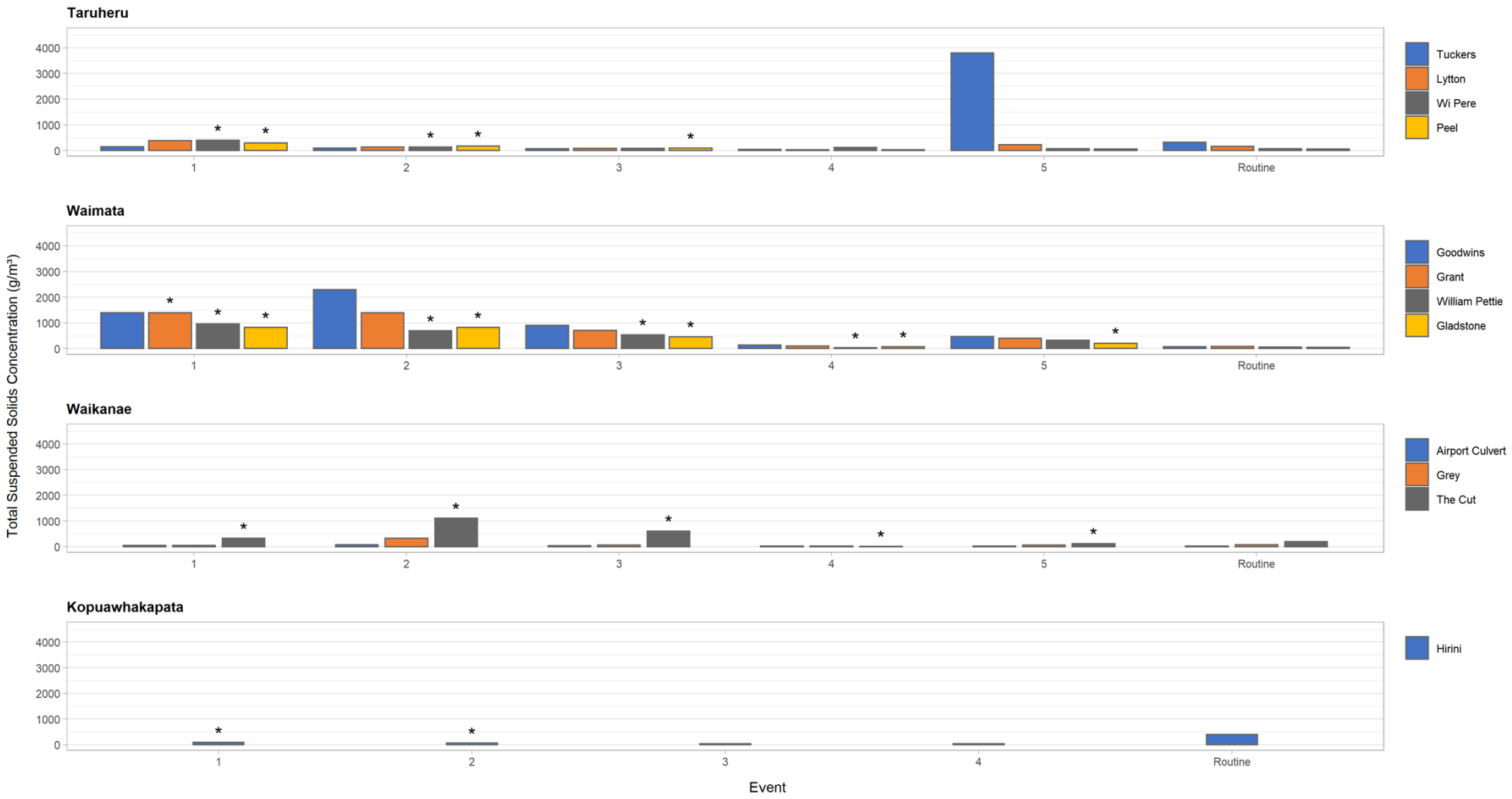

Figure 29: Maximum total suspended solids concentrations during wastewater overflow events (1–4), a rainfall only event, and routine sampling

(A star indicates that a wastewater overflow was nearby or upstream of the monitoring location)

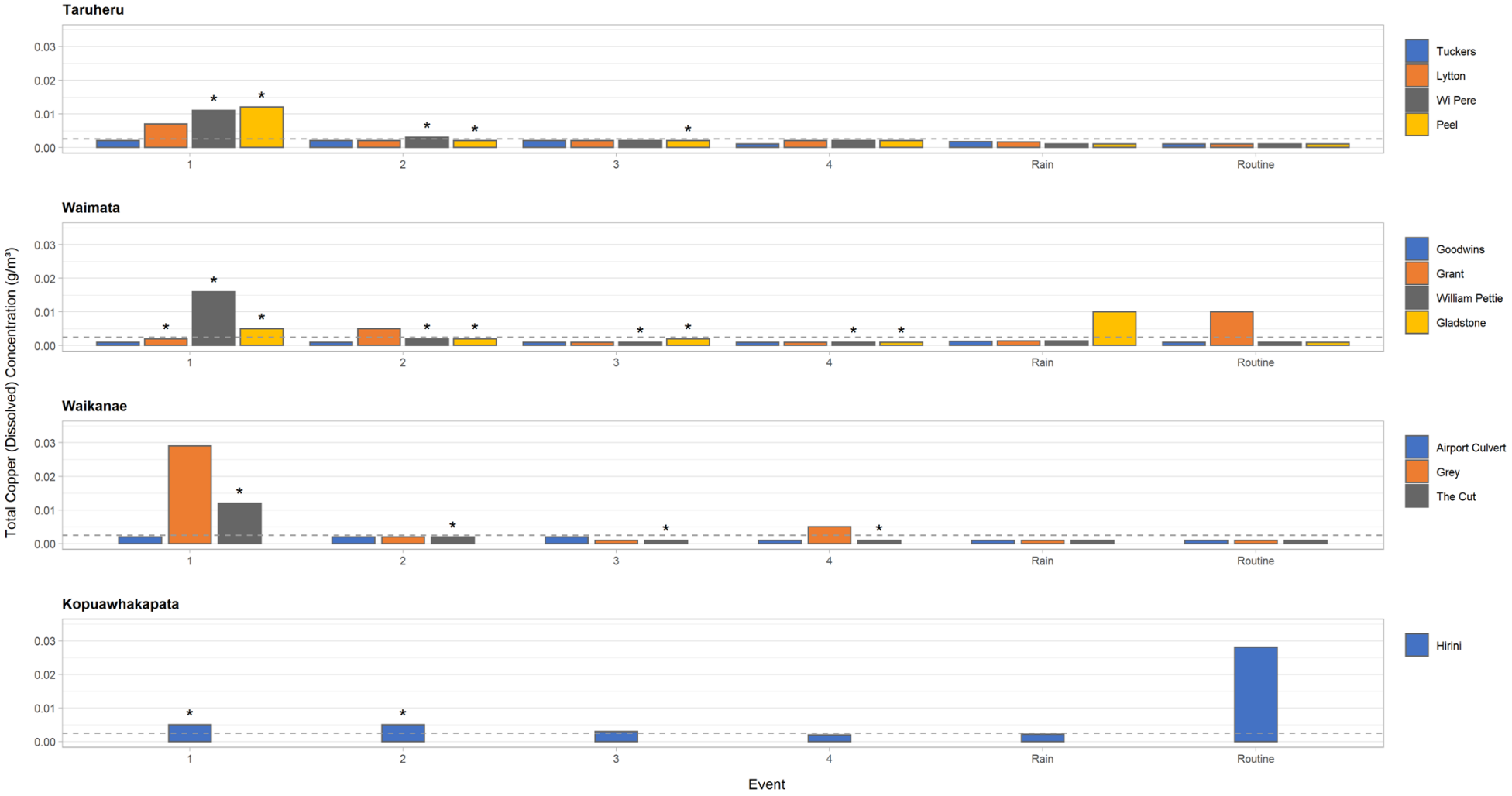

Figure 30: Maximum total copper (dissolved) concentrations during wastewater overflow events (1–4), a rainfall only event, and routine sampling

(A star indicates that a wastewater overflow was nearby or upstream of the monitoring location. The dashed horizontal line shows the ANZG (2018) toxicant guideline value for the 80% protection of freshwater species (0.0025 g/m3))

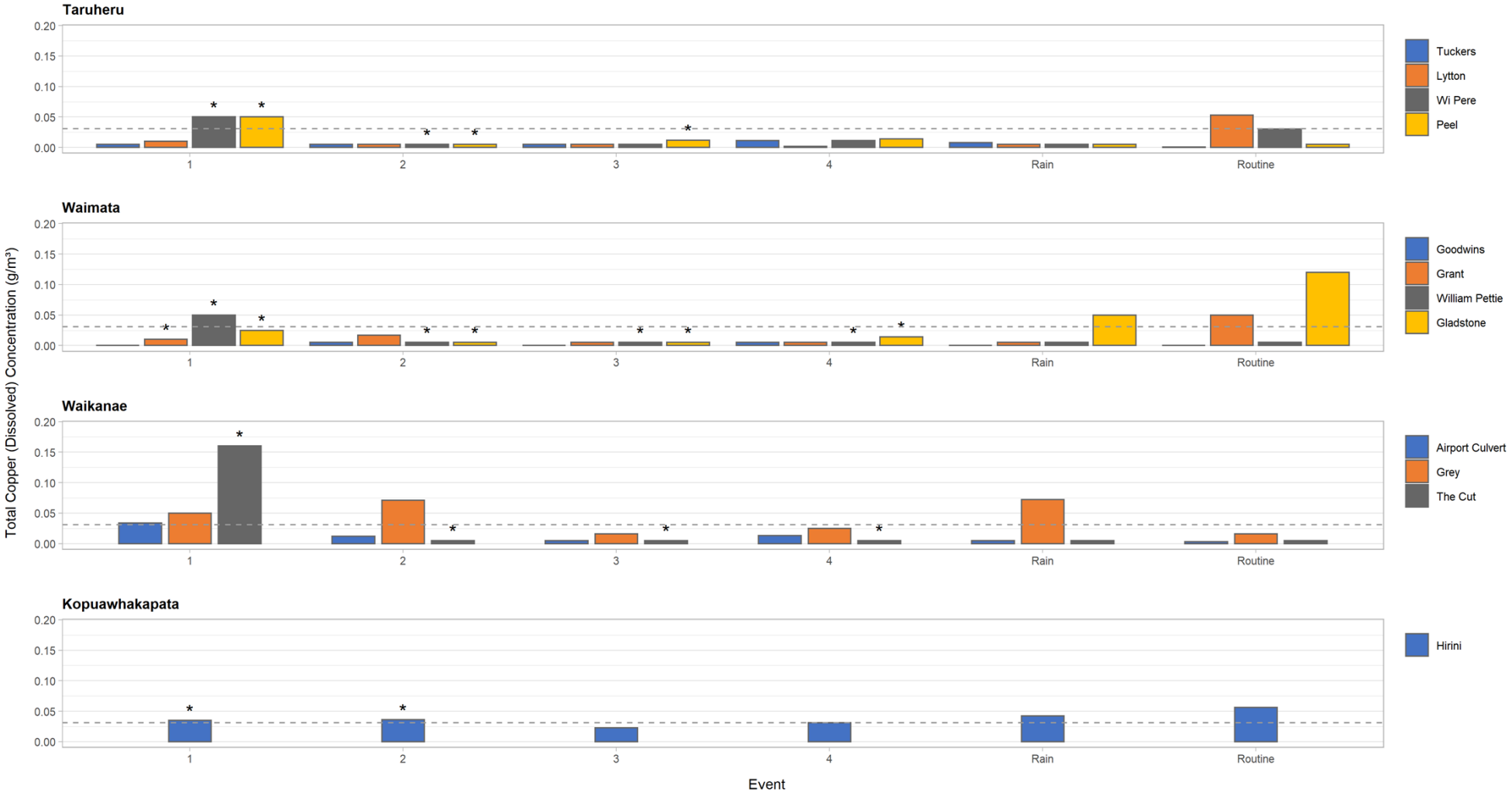

Figure 31: Maximum total zinc (dissolved) concentrations during wastewater overflow events (1–4), a rainfall only event, and routine sampling

(A star indicates that a wastewater overflow was nearby or upstream of the monitoring location. The dashed horizontal line shows the ANZG (2018) toxicant guideline value for the 80% protection of freshwater species (0.031 g/m3))

6.6 Hydrodynamic Modelling – Dispersion and Dilution

6.6.1 Introduction and Methodology

While the monitoring discussed in Section 6.5 above is based on measured water quality, and provides an assessment of the impacts of wet weather overflows on the water quality of Gisborne's rivers in conjunction with other discharges, assessments of potential impacts on the wider receiving environments – primarily the Bay, have also been assessed and described by using hydrodynamic modelling. This approach has the advantage of being able to assess the likely geographic dispersion of the wastewater overflow under a range of tidal, river flow, and meteorological conditions.

MetOcean Solutions was engaged to develop a hydrodynamic model of the rivers and Bay, to model the dispersion of wastewater over a range of discharge scenarios and conditions. MetOcean's full report is provided in Appendix J. However, a summary of the modelling and key outcomes and conclusions is provided below.

The model encompassed the full area of the Bay and beyond, with model cells being concentrated in the rivers and near shore environments as shown in Figure 32.

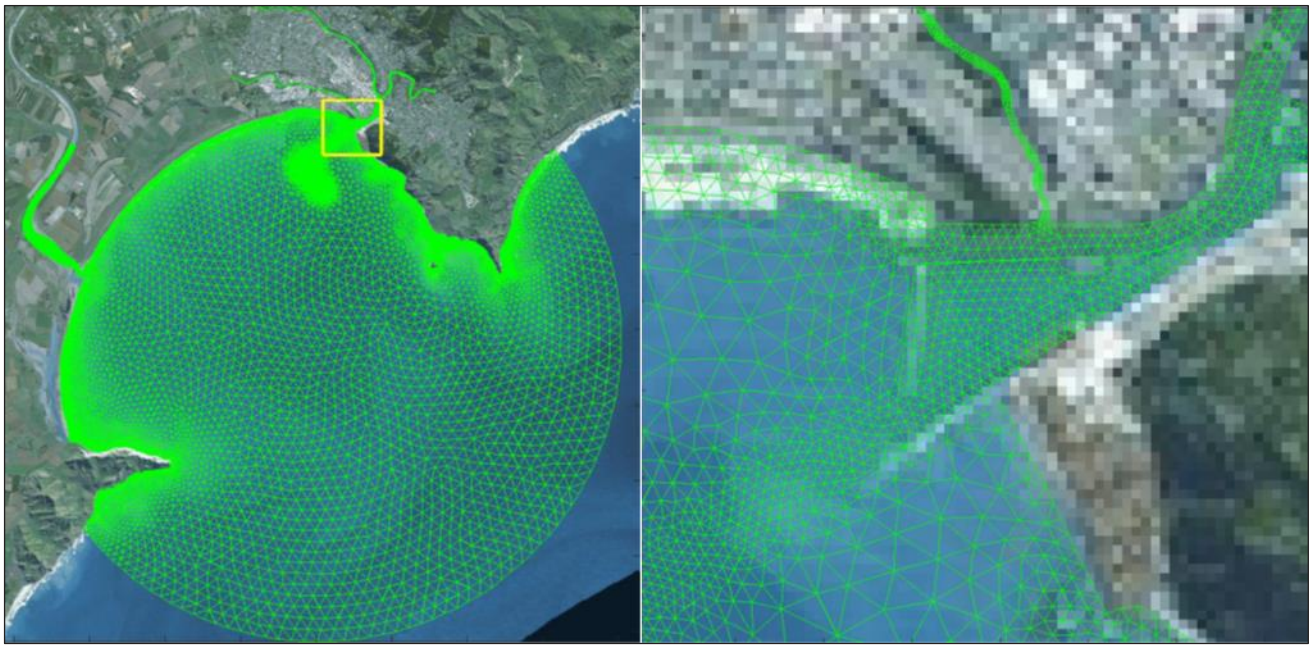

Figure 32: Hydrodynamic Model Mesh of Turanganui a Kiwa/Poverty Bay

Overflow dispersion was modelled for the following discharge scenarios:

- 2-year ARI rain event – current performance of the wastewater network;
- 10-year ARI rain event – current performance of the wastewater network;
- 10-year ARI rain event – future performance of the wastewater network following the successful implementation of the DrainWise programme and removal of 85% of stormwater inflow.

The 2-year ARI future scenario was not modelled as removal of 85% of stormwater inflow will meet the proposed future level of service of no wastewater overflow in a 50% AEP (2-year ARI) rainfall event – that is, there is no overflow to model. The 10-year ARI future scenario was therefore used as a precautionary approach, as this will provide a conservative estimate (over-estimate) of the wastewater overflow dispersion and potential impacts in a rainfall event that exceeds the 50% AEP/2 year ARI event.

Wastewater discharges for each of the modelled overflow scenarios was provided by running the design rainfall events through the Council wastewater network model under Council's current overflow management regime (only releasing overflows for two primary and two secondary overflow locations). To estimate overflow volumes, wastewater model simulations were run without the anticipated stormwater removal and network upgrades ('current') and with the stormwater removal and network upgrades ('future') applied.

While it is possible that the tertiary overflow points could be required in the future in a large rainfall event (greater than the 10 year ARI), this is considered highly unlikely. If these were engaged, they would likely be of relatively low volume compared to the primary and secondary overflow points, and it is difficult to predict where these would take place in such exceptional circumstances. It was therefore considered prudent to apply the modelled wastewater overflow volumes expected in overflow events to the identified primary and secondary overflow points. This approach is validated when considering Council's recent management of wastewater overflows, where Council has generally been able to limit the overflows locations to the primary overflow points.

The predicted wastewater volumes and discharge locations used in the hydrodynamic modelling were provided by Beca (Appendix K) and are shown in Table 18. As can be seen by this information, the implementation of the DrainWise programme and removal of 85% of stormwater inflow will result in no overflows in a 2-year ARI event and reduce overflow volume (a mixture of stormwater and wastewater) by 80% in a 10-year ARI event.

Table 18: Modelled Discharge Locations and Volumes

Discharge Location	**2 Year ARI (m^3)**			**10-year ARI (m^3)**		
	Current	**Future**	**Difference**	**Current**	**Future**	**Difference**
Wainui Street	17,643	0	17,643	17,849	1,545	16,304
Seymour/Turenne	914	0	914	1,710	0	1,710
Oak Street		0		1,358	0	1,358
Peel Street		0		25,782	8,010	17,772
Total	**18, 557**	**0**	**18, 557**	**46,699**	**9,555**	**37,144**

Each scenario was run under the expected river flow for each of the rainfall events, different starting tidal regimes (MHWS and MLWS) and four different wind strength/direction scenarios. In all, overflow dispersion was modelled for 24 different scenarios.

The dispersion is a representation of the spread and dilution of the water coming down the Tūranganui River in the Bay. It is not a representation of health risk, as it does not relate health risk to the concentration of pathogens and other contaminants across the Bay. The dilution information provided by this modelling has been utilised in the health risk and ecological assessments discussed below.

The dispersion modelling shows that the water that exits the Tūranganui River has various patterns of mixing in the Bay, depending on wind direction, tides, and river flow. It shows that the dispersion patterns vary considerably, from being relatively localised to spreading across the Bay. It is noted however, that while the dispersion of the discharge is widespread, the concentration of any contaminants within the Bay reduces substantially with distance from the river mouth.

6.6.2 Dispersion Results – 2-Year ARI Event - Current

Representative results of the modelling of overflow dispersion in the 2-year ARI current event scenarios under different wind and tide scenarios are shown in Figure 33 and Figure 34. These dilution and dispersion plots show the overflow plume dispersing throughout the Bay over a period of 48 hours and are conservative in that they relate only to dilution and do not include any provision for die-off of bacteria/organisms over time.

The plots clearly show that wind direction is a key determining factor in the direction the plume takes once it exits the Tūranganui River. Under persistent and relatively strong S-E wind event (15 and 25 m.s-1 - Figure 33), the winds hold the plume against the coast along Waikanae Beach and towards the Waipaoa River mouth. However, under a strong N-W wind event (15 and 25 m.s-1 - Figure 34) the plume is pushed offshore and out into Poverty Bay along Kaiti Beach as the plume exits the Tūranganui River and migrates southwards towards Tokomaru, Hawea and Te Moana Rocks. In contrast, the stage of the tide at which the overflow is released has a significantly lower influence on the dispersion of the plume.

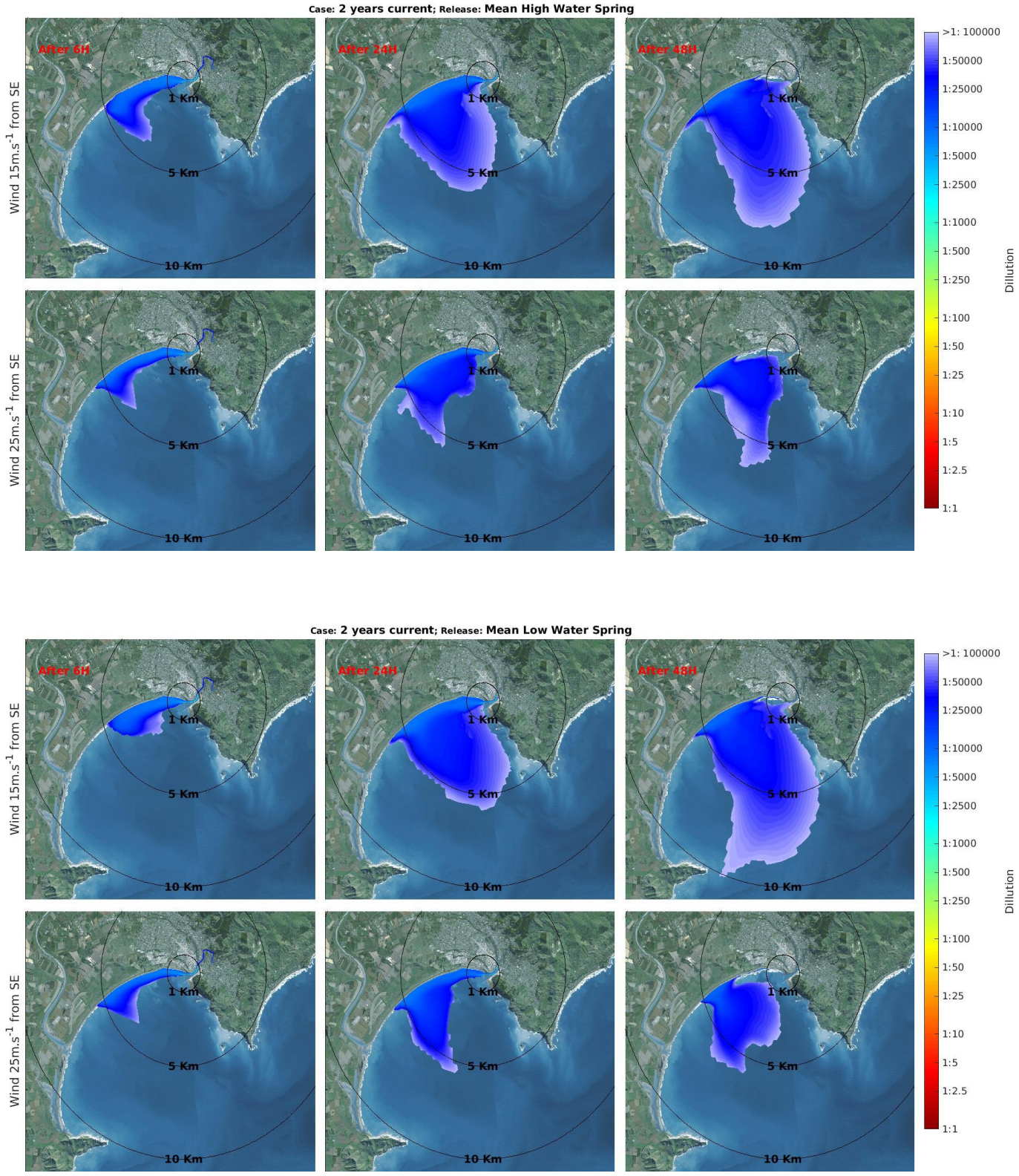

Figure 33: Modelling of Wastewater Dispersion in the Bay, 2-Year Current, SE Wind

(2-year ARI event, current scenario, SE wind, @6, 24 and 48 hours, MHWS (top), MLWS (bottom))

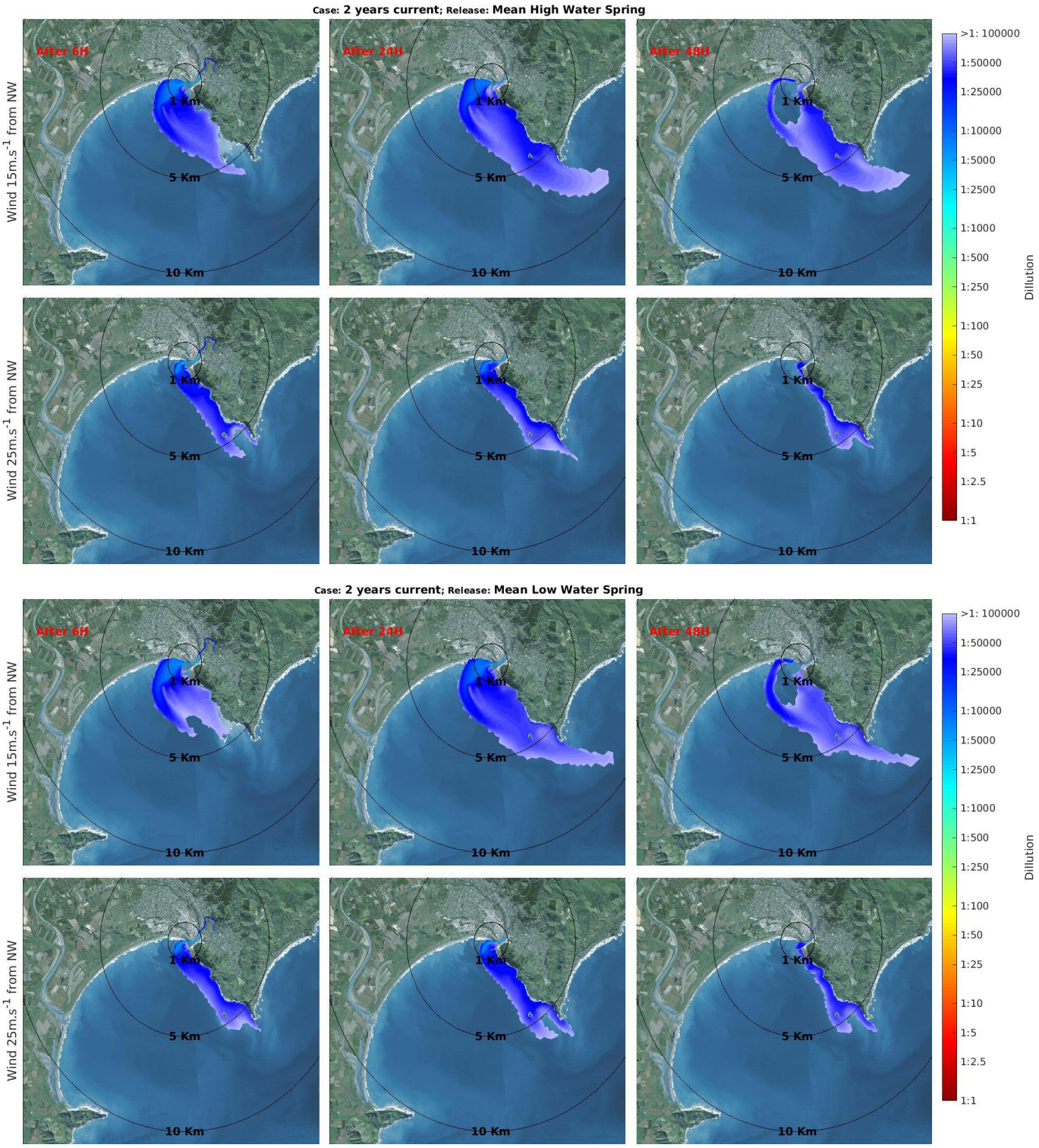

Figure 34: Modelling of Wastewater Dispersion in the Bay, 2-Year Current, NW Wind

(2-year ARI event, current scenario, @6, 24 and 48 hours, NW wind, MHWS (top), MLWS (bottom))

6.6.3 Dispersion Results – 10-year ARI Current and 10 Year ARI - Future

Similar dispersion patterns result from the modelling of the 10-year ARI event – current scenario, although the extent of the plume is more widespread given the significantly larger overflow discharge that occurs in a 10-year ARI rainfall event (Figure 35). Again, the wind direction is the primary determinant of the direction the plume takes upon exiting the Tūranganui River.

In contrast, results from the modelling if the 10-year ARI rain event – future scenario indicates a substantially reduced plume (Figure 36). Under this scenario, the plume is substantially dispersed and diluted within the Bay after 48 hours under both a south-easterly and north-westerly wind. This result is not surprising, given the substantially lower volume of discharge that occurs under the future scenario (20% of the 10-year current ARI volume) following the implementation of the DrainWise programme.

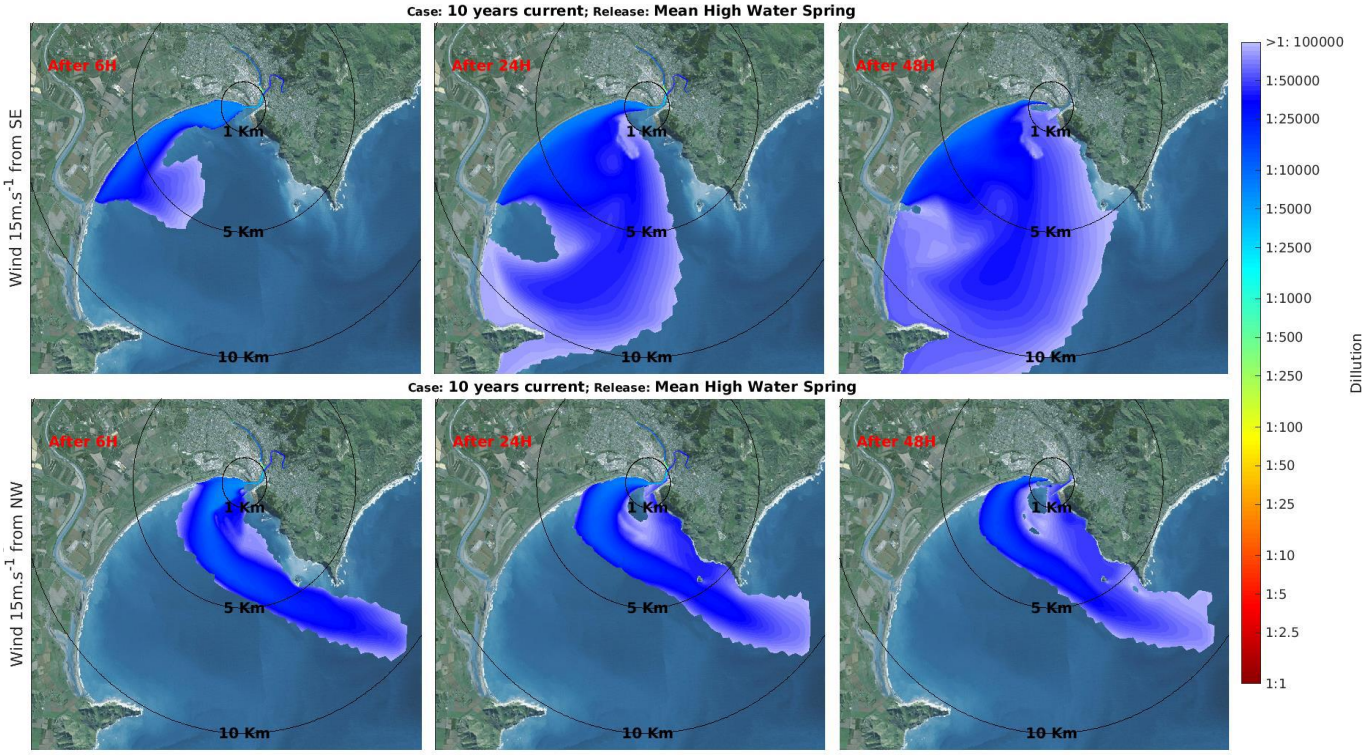

Figure 35: Modelling of Overflow Dispersion in the Bay, 10-Year Current

(10-year ARI event, current scenario, @6, 24 and 48 hours, SE wind (top) NW wind (bottom) MHWS

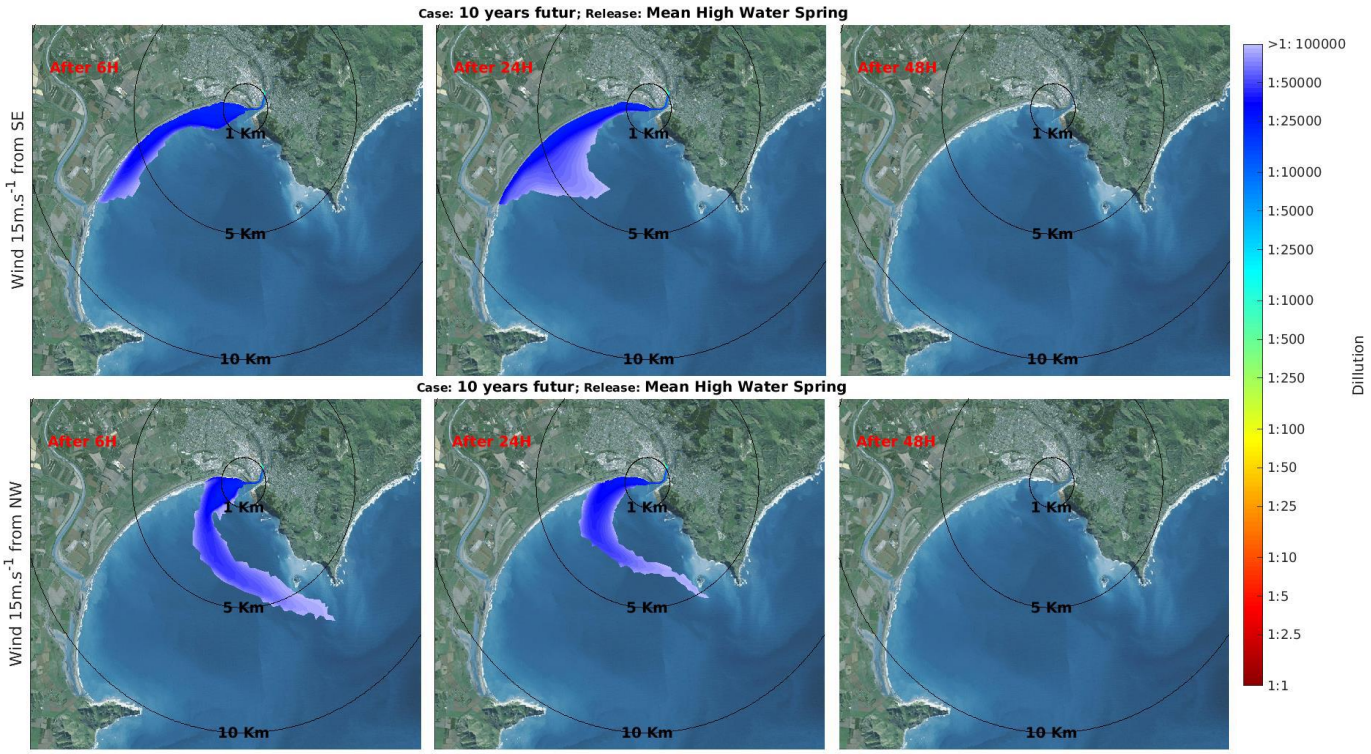

Figure 36: Modelling of Overflow Dispersion in the Bay, 10-year Future

(10-year ARI event, future scenario, @6, 24 and 48 hours, SE wind (top) NW wind (bottom) MHWS

6.6.4 Microbial Contaminant Concentrations

It is important to note that the dispersion plots above demonstrate how the wastewater overflow is dispersed in the Bay and reports the level of dilution. Of more relevance to the potential effects of the discharge is the concentration of the contaminants that are carried in the wastewater flows. To consider microbial contaminant concentrations, MetOcean modelled the concentration of enterococci, using a starting concentration in the overflow of 2,500,000 CFU(ent)/100 mL[33].

Current Situation – 2-year and 10-year ARI events

Selected modelling results are displayed in Figure 37 to Figure 38[34]. These results indicate that under the modelled tidal, wind, river flows and the current 2-year ARI discharge wastewater overflow scenario, maximum predicted microbial concentrations of approximately 450 CFU(ent)/100 mL occur in the Turanganui River and 300 CFU(ent)/100 ml adjacent to Waikanae Beach (Figure 37). This is compared to an 'alert' level of 140 CFU(ent)/100 mL and 'action' level of 280 CFU(ent)/100 mL[35]. The modelling predicts that elevated microbial concentrations continue for approximately 48 to 72 hours before returning to background levels[36].

Not surprisingly, given the higher wastewater discharge volumes, overflows under the 10-year ARI – current scenario give rise to more elevated microbial concentrations with concentrations of up to 800 CFU(ent)/100mL in the Tūranganui River and over 400 CFU(ent)/100mL adjacent to Waikanae Beach in worst case meteorological conditions (Figure 38). Again, concentrations are predicted to return to background levels after approximately 48 to 72 hours.

Future Situation – 10-year ARI event[37]

Significantly lower wastewater volumes are predicted to discharge during a 10-year ARI event following the successful reduction of a substantial amount of stormwater inflow from the wastewater network. As a result, modelling of microbial concentrations for the future 10-year ARI event (Figure 39) show substantially lower levels, with a maximum of 300 CFU(ent)/100 mL predicted for the Turanganui River and less than 200 CFU(ent)/100 mL adjacent to Waikanae Beach.

While this level is above the 'alert' level in the Marine and Freshwater Recreational Water Quality Guidelines, it is below the action level. In addition to lower concentrations, for the most part water quality returns to normal approximately 24 hours after the overflow has ceased. However, towards the central area of the Bay water quality returns to normal approximately 48 hours after the overflow has ceased[38].

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[33] Marine microbial water quality is assessed using enterococci. Based on the results of the 'in-network' overflow sampling results, a starting enterococci concentration of 2,500,000 CFU/100 ml is at the upper (high) end of the range that is likely to occur in an overflow discharge that is naturally highly diluted by stormwater (1,000,000 – 2,000,000 CFU/100ml)

[34] See Appendix J for the full range of modelling results.

[35] Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas. Ministry for the Environment, 2003.

[36] See Appendix J, page 65.

[37] As above, the 2-year ARI scenario was not modelled as no overflows are predicted for this event.

[38] See Appendix J, page 87.

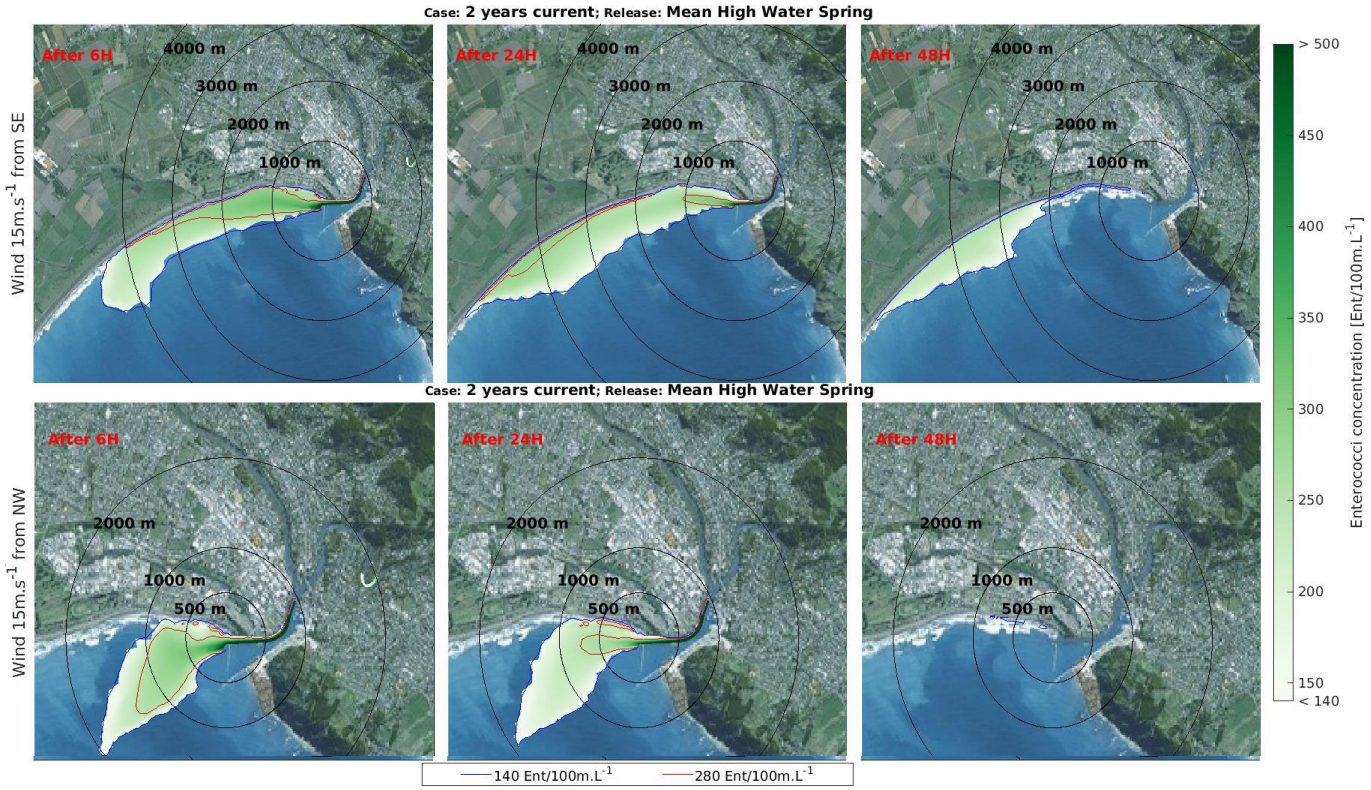


Figure 37: Modelling of Microbial Concentrations in the Bay, 2-Year Current

(2-year ARI event, current scenario, @6, 24 and 48 hours, SE wind (top) NW wind (bottom) MHWS

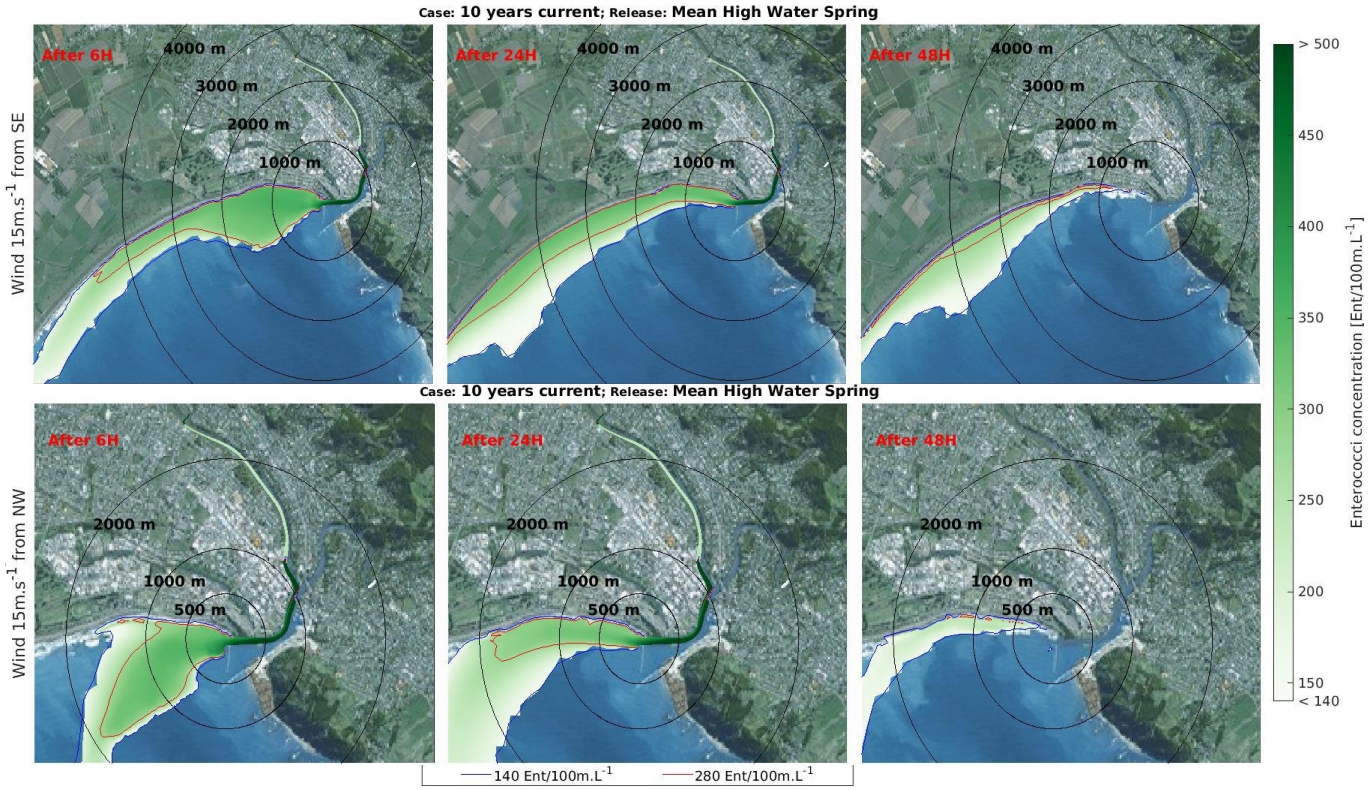


Figure 38: Modelling of Microbial Concentrations in the Bay, 10-Year Current

(10-year ARI event, current scenario, @6, 24 and 48 hours, SE wind (top) NW wind (bottom) MHWS

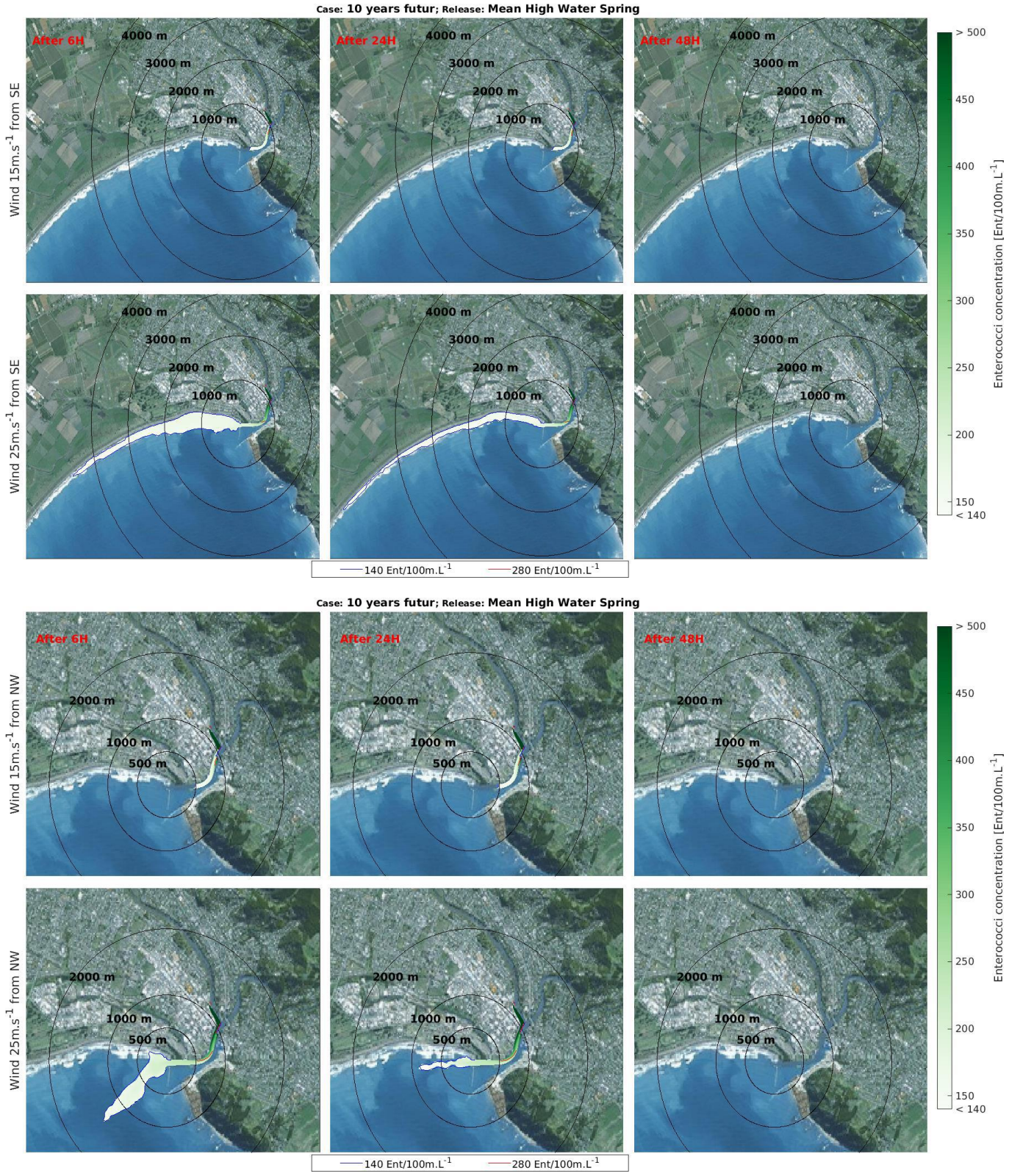


Figure 39: Modelling of Microbial Concentrations in the Bay, 10-year Future

(10-year ARI event, future scenario, @6, 24 and 48 hours, SE wind (top) NW wind (bottom) MHWS

6.6.5 Other Contaminants

MetOcean also used the model to predict concentrations of Total Kjeldahl Nitrogen (TKN) Total Phosphorus (P), Total Suspended Sediment (TSS) and virus concentrations. The results of this modelling is not re-presented here. However, the implications of the predicted levels are discussed in the Ecological and Health Risk Assessments that have been undertaken and are summarised below.

6.6.6 Summary and Discussion

The dispersion modelling of wastewater overflows consisted of simulating overflow discharges for both 2 and 10-year ARI events, using modelled overflow discharge volumes from the wastewater model (which is calibrated to monitored flows), under a range of climatic conditions. The modelling assessed the existing stormwater and wastewater drainage regimes for both 2 and 10-year ARI events and the 10-year ARI level for the future stormwater and wastewater drainage network assuming a substantial reduction in stormwater inflow as described elsewhere in this application.

For both the existing 2 and 10-year ARI events, under persistent and relatively strong south-easterly wind events the freshwater from the rivers, containing the wastewater discharged during that event, is dispersed against the shoreline along Waikanae Beach and towards the Waipaoa River mouth. This water is eventually dispersed out into Poverty Bay and re-enters the southern end of the bay in the vicinity of Young Nicks Head. Conversely, under similarly strong north-westerly wind events the water is forced offshore and out into Poverty Bay away from the Tūranganui River mouth and extends southwards towards Tokomaru, Hawea and Te Moana Rocks and along Kaiti Beach.

For the current scenarios, microbial (enterococci) concentrations resulting from the overflows exceed marine recreation water quality guidelines in the Tūranganui River and adjacent to Waikanae Beach for a period of 48 to 72 hours. However, following the successful implementation of the DrainWise programme, and the substantial reduction in stormwater inflow into the wastewater network, enterococci concentrations are significantly decreased. Under this future scenario, recreational water quality guidelines are only exceeded in the Tūranganui River close to the point of discharge and for a shorter period of time (24 hours). The Waikanae Beach area is unlikely to be affected after 24 hours, however with risks potentially still higher at the interface (mouth of the river) between the Tūranganui River and the eastern end of Waikanae Beach.

It is important to recognise that the modelling has only assessed the effects of the wastewater overflow in isolation of other discharges and not the cumulative effects of wastewater overflows and other discharges – notably rural and urban stormwater runoff. As WWOs occur in very large rainfall events, runoff from other land sources will also contribute significantly to the water quality in Gisborne's rivers and the Bay. This runoff also contains significant levels of microbial contaminants, nutrient and suspended sediment. Accordingly contaminant levels, particularly microbial contaminants, will be higher than those predicted in the modelling. This is demonstrated in the monitoring results from Council's bathing water monitoring programme (Figure 20), which demonstrates significantly higher measured microbial levels than those modelled using wastewater alone.

6.7 Ecological Effects

Coast and Catchment Limited were commissioned to undertake an assessment of the ecological effects of wastewater overflows (Appendix H). A summary of the results of their assessment and conclusions is provided below.

6.7.1 Water Quality

Coast and Catchment used a Principal Components Analysis (PCA) to obtain an understanding of water quality at the estuarine and freshwater river sites. This approach compares the composition of river water (sampled during overflow events) with that of wastewater (manhole samples) to assess the contribution of the wastewater to river water quality for key indicator parameters. A comparison against ANZECC (2000) trigger values for the protection of 80% and 90% of species was also undertaken.

The analysis showed that wastewater (manhole) samples were clearly differentiated from the receiving waters by elevated concentrations of ammonia-N, DRP, TP and TN, but a clear wastewater signal was not apparent among river sites.

In respect of comparison against ANZECC guideline values, metal (copper and zinc) trigger values were occasionally exceeded, but most estuarine samples were close to, or below, detection limits. Ammonia-N toxicity trigger values were frequently exceeded in wastewater samples taken from manholes, but were not exceeded in estuarine or freshwater samples following mixing and dilution.

Dissolved oxygen (DO) levels from estuary and freshwater sites were also compared with reference values. In the estuary sites, lowest DO levels were obtained from the Lytton Road site[39], and from the Grey Street site on Waikanae Stream. This is significant because, the Lytton Road site is upstream of the controlled overflows and no controlled overflows take place into Waikanae Stream. In general, DO saturation increased down-river, but there also appeared to be a pattern of lower DO saturation during and/or after discharge events. A similar pattern occurred at freshwater sites around 4 km above the nearest outfall on Taruheru River (Tuckers) and around 7 km above the nearest outfall on Waimata River. This suggests that the DO sags were related to rainfall and associated storm flows rather than wastewater inputs

Coast and Catchment concluded:

- The key wastewater contaminants of concern are ammonia-N (in relation to toxicity and productivity effects) and phosphorus (in relation to productivity effects), but toxicity thresholds were not exceeded in the rivers.
- River metal concentrations appear to primarily be related to stormwater inputs, rather than wastewater, with trigger values for copper and zinc occasionally exceeding toxicity trigger values in the rivers.
- Dissolved oxygen levels were relatively low at upper estuary sites but saturation increased downstream, with sags in DO appearing to be related to rainfall events. Dissolved oxygen levels in the Waikanae Stream were particularly low, but this appears to be unrelated to wastewater inputs.

[39] See Figure 18 for water quality sampling site locations

The overall conclusion drawn from the water quality assessment is that under the conditions prevailing over the period monitored, the current effects of the wastewater on receiving waters were relatively minor. It is noted that this analysis was aimed at ecological effects and did not assess microbial contamination and associated risks to human health (these are assessed in Section 6.5 and 0).

It is noted that the DrainWise Implementation Programme will progressively reduce the frequency and volume of overflows, such that any adverse effects will be progressively reduced.

6.7.2 Benthic Survey

Introduction

The potential habitat and ecological effects of discharges from the primary and secondary discharge points were assessed by surveying benthic communities and sediment quality in urban estuarine sections of the Taruheru, Waimata and Tūranganui Rivers.

Benthic communities and sediment quality are sensitive to the effects of multiple environmental stressors, including physical disturbance, sedimentation and smothering, toxic contaminants, and organic enrichment. As such, gradients in sediment quality and community composition commonly occur around wastewater outfalls. Relative to other areas, sediments in close proximity to wastewater outfalls could reasonably be expected to have elevated concentrations of nitrogen, phosphorus, total organic carbon and total organic matter (based on the general characteristics of wastewater).

As with water quality, other land uses also influence sediment quality. Rural land uses increase sediment and nutrient loads, while urban activities generate stormwater contaminants such as sediment and heavy metals. Sediments below urban stormwater outfalls are less likely to have elevated nutrient concentrations, but they commonly have elevated concentrations of heavy metals (particularly copper and zinc) and could have elevated total organic carbon and total organic matter concentrations (caused by inputs of organic matter, such as leaf litter). Zinc is a key urban stormwater contaminant, but it is not a significant component of urban wastewater unless stormwater or significant trade waste inputs from zinc-related industries are present, which is not the case in Gisborne's wastewater overflows.

The effects of these inputs are moderated by natural physical processes. Sediments, and any contaminants bound to them, tend to flocculate, settle out and accumulate in brackish, upper estuary areas, making them muddier than outer estuary and coastal zones. However, the potential for sediment accumulation also depends on flushing characteristics and the available accommodation space for sediments (e.g., sediments are unlikely to accumulate in a well flushed channel with little intertidal margin). As noted earlier, disentangling all of these influences is difficult.

Wastewater effects on sediment quality and benthic ecology in the Taruheru, Waimata and Tūranganui Rivers was therefore assessed by measuring a range of indicator parameters:

- mud content (measured as a percentage (%) of the total weight of sediment below 63 µm);
- total organic carbon (%);
- total organic matter (derived from ash free dry weight);
- total nitrogen and total recoverable phosphorus; and
- total recoverable zinc (as an indicator of stormwater influences).

This was done for samples obtained from 12 sites spread along tidal reaches of the rivers, together with benthic macrofauna at six sites in the lower sections of the rivers. A conservative (worst case) approach was taken to determining effects, by including two sites that were within 20 m of the Wainui Rd and Palmerston Rd/Peel St outfalls, and two within 20 m of the main-channel junctions of the tributaries into which the Oak St and Seymour Rd/Turenne St outfalls discharge. While an allowance is usually made for reasonable mixing to occur[40], sampling close to the outfalls was done to maximise the likelihood that any observed effects could be linked to discharges from the key wastewater outfalls.

Results – Sediment Quality

Sediment quality varied along and between river systems, but evidence of impacts in the immediate vicinity of the primary and secondary wastewater outfalls was limited. Key sediment quality findings are:

- Averaged, total nitrogen concentrations in the two upper Taruheru sites (which includes the site below the Oak St. outfall) were at or above concentrations considered to cause moderate stress on a number of aquatic organisms (1000-2000 mg/kg). Concentrations at all other sites were in the range considered to cause minor stress on sensitive organisms (250–1000 mg/kg) (including sites below the Seymour/Turenne, Wainui and Palmerston/Peel outfalls). A general pattern of declining total nitrogen concentrations was observed down the urban section of Taruheru River, while relatively little variation was observed along Waimata and Tūranganui Rivers.
- Highest averaged total recoverable phosphorus concentrations were recorded at the two upper Taruheru sites (which includes the site below the Oak St outfall) and from the site below the Palmerston/Peel outfall. However, concentrations at all sites were within the "good" range (200–500 mg/kg).
- Averaged, total organic carbon concentrations in the three upper Taruheru sites (which includes the site below the Oak St outfall) were at or above concentrations considered to cause moderate stress on a number of aquatic organisms (>1–2%), while concentrations at five sites were in the range considered to cause minor stress on sensitive organisms (0.5–1%) (including sites below the Seymour/Turenne, Wainui and Palmerston/Peel outfalls). Total organic carbon concentrations at four sites were in the range considered to cause no stress. A general pattern of declining total organic carbon concentrations was observed down the urban section of Taruheru River. Relatively little variation was observed along Waimata and Tūranganui Rivers. Very similar patterns were observed in total organic matter.
- Averaged, mud content at all sites was in the range considered to cause significant persistent stress on a range of aquatic organisms. A general pattern of declining mud content was observed down the urban section of Taruheru River. Mud content was relatively high and variable in the Waimata and Tūranganui Rivers.

[40] The TRMP does not define a distance at which reasonable mixing is considered to occur. However, the Hawkes Bay Regional Resource Management Plan defines reasonable mixing as being the lesser of: (i) a distance 200 metres downstream of the point of discharge, or (ii) a distance equal to seven times the bed width of the surface water body, but which shall not be less than 50 metres, or (iii) the distance downstream at which mixing of contaminants has occurred across the full width of the surface water body, but which shall not be less than 50 metres.

- Averaged, zinc concentrations were below the low level (ISQG-L) ANZECC (2000) sediment quality guideline value, but concentrations were moderately elevated at the site below the Palmerston/Peel outfall where they exceeded the widely used ERL guideline value of Long & Morgan 1990). With the exception of the spike in zinc concentrations below the Palmerston/Peel outfall, there was a general pattern of declining concentrations down the urban section of Taruheru and Tūranganui Rivers. Zinc concentrations in Waimata River were consistently low along its urban reaches.

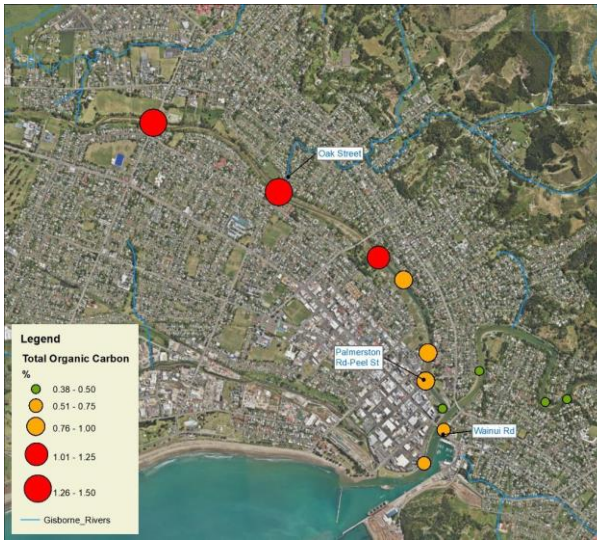
These levels are displayed in Figure 40.

Coast and Catchment concluded that overall, the results show an underlying pattern of declining levels of total nitrogen, total organic carbon, total organic matter and mud down the urban section of Taruheru River. The occurrence of relatively high concentrations of these parameters at the uppermost site (which is upstream of the most frequently overflowing outfalls) and relatively low concentrations at sites downstream of frequently overflowing outfalls (on all three rivers), suggests the observed trend is unrelated to wastewater overflows. The factor, or factors, causing these trends are uncertain, but rural runoff and natural sedimentation processes at the marine-freshwater interface may be involved.

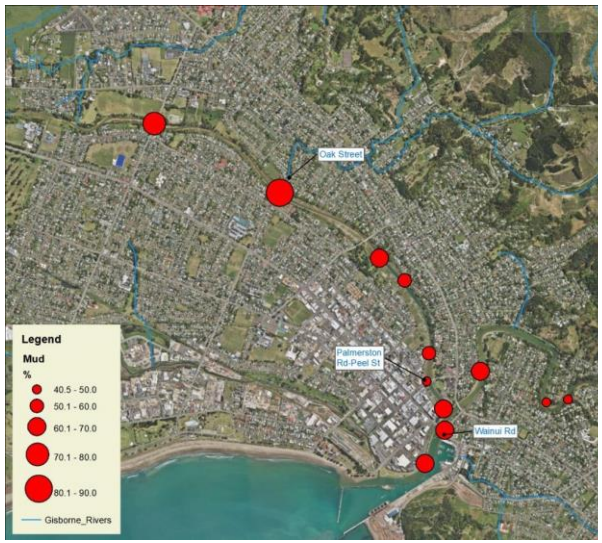
However, the influence of wastewater can potentially be seen as a spike in the sediment concentrations of phosphorus immediately below the Palmerston/Peel outfall. A similar spike in zinc concentrations at that location also suggests that stormwater runoff has a localised effect on that area. Concentrations of most parameters are also slightly higher below the Oak St outfall compared with the adjoining upstream site (Lytton Road).

Nitrogen

Recoverable Phosphorous



Organic Carbon



Mud

Zinc

Figure 40: Sediment Quality - Gisborne Rivers

Results - Benthic Ecology

Benthic macrofaunal communities in benthic cores were collected from sites around and below the confluence of Taruheru, Waimata and Tūranganui Rivers. These contained a moderate total number of taxa, ranging from 14 to 20 across the sites. However, the analysis did not detect a significant difference in the average number of taxa in the core samples collected from each site.

Overall, the same seven taxa made up between 91% and 97% of the total specimens counts at the six sites sampled including small bivalves, cockles, wedge shells and polychaetes. Samples obtained directly below the Peel St and Wainui Rd outfalls had high numbers of cockles (all small sizes). Relatively high abundances of cockles and wedge shells are notable because both species are considered to be sensitive to fine sediment and contaminants. However, the majority of cockles and wedge shells were small, with most cockles <5 mm in length.

Differences in community composition were examined using a range of statistical techniques. Some differences were observed between the sites, which largely reflected variation in the relative abundance of individual taxa, rather than the presence or absence of those taxa.

Overall, Coast and Catchment concluded that analyses of benthic ecological samples indicated that:

- Intertidal communities of the lower Waimata, lower Taruheru and Tūranganui differ from each other;
- Benthic communities at sites directly below the two primary wastewater outfalls in the lower Taruheru and Tūranganui zones, were largely indistinguishable from the communities at other sites within those zones; and,
- The assessment and analyses described suggest that the wastewater discharges had little effect of any practical significance on benthic ecology in the receiving environments sampled.

6.7.3 Summary and Conclusions

Overall, Coast and Catchment conclude that Gisborne's urban waterways have been modified by rural and urban land uses, and flood controls. Its urban streams generally consist of piped, channelised and open reaches, with narrow riparian margins and little cover. Unsurprisingly, macroinvertebrate surveys have shown that the quality of urban streams and rivers tends to be poor. However, they do continue to support tolerant macroinvertebrates and fish, including eels. Estuarine sections of Gisborne's rivers also support a range of fish species that are targeted by fishermen, and support moderately diverse invertebrate communities.

Wastewater overflows have the potential to adversely affect water quality and aquatic communities:

- By increasing nutrient concentrations and productivity;
- Through the deposition and decomposition of organic matter; and
- Through the effects of toxic contaminants.

While wastewater overflows can result in the above effects, the actual ecological effects caused by wastewater overflows depend on the nature of the discharges, discharge loads and frequency, whether overflows occur during dry or wet weather, and the values and assimilation capacity of the receiving environment (note that cultural elements of water quality, and microbial contaminants and human health

effects were not assessed in this study but are assessed in section 6.11 and in the tangata whenua engagement (Appendix L)).

Dry weather overflows are unpredictable, in terms of when and where they occur, and their magnitude of effect. While they have the potential to cause significant adverse effects, actual impacts are site and discharge specific. Dry weather overflows that do not enter water (ie they remain on land) will not affect water quality or aquatic ecosystems. Small discharges of residential sewage directly into Gisborne's main rivers are likely to be minor because of the available dilution in these large waterways and Council's quick response and management of such unexpected overflows. Conversely, a large discharge over an extended period into a smaller/confined waterway could have a marked impact, particularly if the discharge included a large trade waste component. In such events dilution is reduced and the effects are more difficult to manage. Having effective systems and processes for preventing (education, cleaning, maintenance and renewal), detecting and responding to such events is therefore required. These systems and processes to respond to unpredictable DWOs are discussed elsewhere in this application and the continued adoption of these will be required by conditions of consent.

In respect of Gisborne's WWOs, Coast and Catchment concluded that wet weather discharges do not have a significant effect on water quality or benthic ecology in estuarine sections of Gisborne's rivers (cultural and human health considerations excluded) as:

- Overflow and corresponding river water quality analyses suggested that the effects of the monitored, wet weather discharges on urban river water quality, were below levels of ecological concern;
- The results of water quality monitoring were consistent with model predictions that suggest nitrogen, phosphorus and suspended solids concentrations from discharges will rapidly be diluted to levels well below those recorded in GDC's river monitoring programme;
- Only minor changes in sediment quality were detected directly below two of the primary and secondary outfalls;
- Adverse ecological effects were not apparent immediately below primary and secondary outfalls in lower river sections at distances that were less than what would likely be considered 'reasonable mixing'.

As limiting discharges to the primary and secondary outfalls can be done without increasing discharge volumes at those outfalls, Coast and Catchment conclude that the ecological effects of the proposed wet weather discharges are likely to be minor, as WWOs are episodic, dispersal and dilution is predicted to be rapid, and no patterns were identified in benthic ecology, water quality or sediment quality that could be definitively linked to existing overflows.

Lastly, it is noted that Coast and Catchment's analysis was based on the existing environment and current/historic performance and associated overflow discharges. Substantially reducing WWO frequency and volume, and maintaining DWOs at a practicable minimum, as proposed in this application and which will be required by appropriate conditions of consent, will likely further reduce already minimal ecological effects.

6.8 Public Health Risk - Pathogens

6.8.1 Introduction

Untreated wastewater can carry a range of pathogens including protozoans, viruses and bacteria, which if present in high concentrations can present public health risks when discharged via wastewater overflows. Streamlined Environmental Limited were engaged to undertake a Quantitative Microbiological Risk Assessment (QMRA) to assess the extent of health risk under the current and future (following implementation of the DrainWise Programme) state. Streamlined Environmental's (Streamlined) report[41] is attached as Appendix M, and their approach and key conclusions are summarised below.

It is noted that the QMRA only considered health risks associated with wastewater overflows, and not the cumulative risks associated with a range of pathogen sources. A cumulative QMRA was not undertaken because all of the sources of pathogens are not known and cannot be quantified. This is an aspect that GDC is continuing to work on through its integrated catchment planning, and is currently undertaking QMRA assessments on the marine outfall (treated wastewater discharge), which will then form part of an overall picture[42].

In recognition of this, a precautionary (conservative) approach was adopted. This was achieved by accounting for very high influent virus concentrations that occur during on-going but undetected viral illness outbreaks in the community; assuming the wastewater overflow is not diluted by stormwater; reporting children's illness risk as opposed to the generally lower adults' risk; including a dilution-only scenario that does not include solar ultraviolet-based inactivation of viruses; and applying a bioaccumulation factor to shellfish.

6.8.2 Exposure Assessment

The main parties at risk of exposure to pathogens in the receiving environment (marine and river sites) due to wastewater overflows are those that engage in contact recreation in, or those who consume raw shellfish collected from, waters potentially impacted by the overflows.

In order to assess the potential level of exposure, the following were considered:

- proximity of the site to discharge outlet;
- exposure pathways that allow the pathogen to reach people and cause infection (through the air, through ingesting polluted water, consuming shellfish, etc.);
- range (minimum, maximum and median) of pathogen concentrations in treated effluent;
- discharge volume of untreated wastewater;
- environmental fate of microbial contaminants in the marine receiving environment, considering the effects of dilution;

[41] Dada, A.C. (2020) Quantitative Microbial Health Risk Assessment for Wet-Weather Wastewater Discharges into City Rivers and Poverty Bay, Gisborne. Report GDC 1801, Streamlined Environmental, Hamilton, 48 pp.

[42] Not however, that monitoring of enterococci in the bay (Figure 19) provides an indication of cumulative effects on microbial water quality as does the overflow monitoring discussed above.

- how much water a child [most sensitive receptor] will ingest over a period of time during a particular recreational activity; and
- amount, frequency, length of time of exposure, and doses for an exposure.

In consultation with staff at GDC, 14 locations in Gisborne's rivers and Tūranganui-a-Kiwa/Poverty Bay were identified for the purpose of modelling the dispersion of wastewater contaminants. These sites are shown in Figure 41.

Figure 41: Heath Risk and EOC Assessment Locations

Assessment sites numbered and in yellow, priority overflow discharge locations in red

Wastewater overflow dispersion and dilution estimates at each of the sites were provided by MetOcean[43] for a range of overflow, weather/oceanographic scenarios. The modelled overflows were the 2-year and 10-year annual recurrence interval (ARI) rainfall events for the existing drainage network and the 10-year ARI rainfall event for the future (following the implementation of the DrainWise programme) scenario.

Raw wastewater pathogen concentrations were derived from information from GDC's WWTP inflows, published New Zealand QMRAs and other studies. The assessment conservatively assumed that all of the overflow was undiluted wastewater. In reality, wet weather wastewater overflows comprises predominantly stormwater (at least 75 % stormwater[44]).

[43] Appendix J

[44] Based on a minimum pipe sizing of four times average dry weather flow

Typically, the dose of the pathogen that an individual ingests, inhales, or comes into contact with, is used as the input to models to predict the probability of infection or illness. The wastewater pathogen concentrations and the ingestion rates for the water users (adults and children, in the case of swimming or other contact recreation) were used to convert pathogen concentrations in the receiving environment into doses. In order to assess risks due to consumption of raw harvested shellfish, ingestion rates used were informed by estimates of daily intake of 98 consumers of mussels, oysters, scallops, pipi and tuatua in the 1997 National Nutrition Survey, as reported in previous New Zealand QMRAs.

Health risk was statistically modelled and the result of the analysis is a full range of possible risks, including average and worst-case scenarios, associated with exposure to pathogens during the identified recreational activities or following consumption of raw shellfish. Risk is presented as a scale ranging from high (>10% chance of illness), moderate (5-10% chance of illness), low (1-5% chance of illness) to a no observable adverse effects level (NOAEL - < 1% chance of illness) for each of the exposure route being:

- Ingestion during recreational water use;
- Inhalation during recreational water use; and
- Consumption of raw harvested shellfish.

Exposure was assumed to occur 12 hours after the overflow event.

6.8.3 Risk Assessment Results

During the two current scenarios (2-Yr Current and 10-Yr Current ARI), overall predicted enteric illness risks among 100 sensitive individuals (children) who swim at five out of the 14 exposure sites were below the NOAEL. Low enteric illness risks were predicted to be associated with the remaining nine sites – although different sites were affected under different wind, river flow and tidal conditions.

For the 10-Yr Future ARI scenarios (that is, after the substantial stormwater inflow reduction and other drainage improvements through the DrainWise programme), predicted enteric illness risks in 100 children engaging in recreation at any of the 14 exposure sites were below the NOAEL at all sites.

Inhalation during recreational water use

During the two current scenarios (2-Yr Current and 10-Yr Current ARI), overall predicted acute febrile respiratory illness risks among 100 sensitive individuals (children) who swim at 4 out of the 14 exposure sites were below the NOAEL. Low acute febrile respiratory illness risks were predicted to be associated with the remaining ten sites – although several sites only exhibited low risks under some wind, river flow and tidal conditions (and NOAEL at other times).

For the 10-Yr Future ARI scenarios (that is, after the substantial stormwater inflow reduction and other drainage improvements through the DrainWise programme), predicted acute febrile respiratory illness risks in children engaging in recreation at any of the 14 exposure sites were below the NOAEL at all sites.

Consumption of raw harvested shellfish

Low to high risks are associated with consumption of raw shellfish harvested (12 hours after the overflow discharge) at most of the modelled exposure sites (13 out of 14 sites) as a result of overflows that currently occur as a result of the 2-year and 10-year rainfall events, suggesting that most of the sites are impacted by wastewater overflows. This risk is reduced substantially following the implementation of the

DrainWise programme (in the 10-year ARI rainfall event), but there is a residual risk. For instance, enteric health risk at 9 out of the 14 considered sites will reduce from high to low risk following DrainWise improvements and from high to moderate at the other three sites. These results do not take into account other sources of pollution that may affect shellfish.

6.8.4 Discussion and Conclusion

Streamlined Environmental undertook a quantitative health risk assessment utilising precautionary (conservative) assumptions – in part in recognition that the assessment only assessed health risks associated with the modelled wastewater overflows and not the cumulative risk from all pathogen sources. While there are broader catchment issues, wastewater discharges include human-derived pathogens and other contaminants, which can pose different risks to those from animal-derived pathogens. Both are however a concern.

The results of the QMRA show that during overflows from the two current scenarios (2-year current and 10-year current ARI rainfall), overall predicted enteric and respiratory illness risks among 100 individuals (children) who swim at most of the exposure sites (12 hours after the overflow) are low (1 to 5% chance of illness) or otherwise below the NOAEL (<1% chance of illness).

During the 10-year future ARI scenarios (that is, after improvements with concomitant reduction of stormwater inflows in the stormwater network), overall predicted enteric and respiratory illness risks among 100 children engaging in recreation at any of the 14 exposure sites are below the NOAEL. The proposed reductions in stormwater ingress into the wastewater network (10-year future ARI scenario) therefore significantly reduces risks associated with ingestion or inhalation of water at the exposure sites.

Streamlined Environmental advise that the results do not account for the continuous discharge of treated wastewater from the WWTP outfall in Tūranganui-a-Kiwa/Poverty Bay nor urban and rural stormwater runoff, which will add to the potential health risks from overflows. Hence, while the results suggest that the enteric risk associated with ingestion during recreational water use is below the NOAEL at some sites, the risks may be higher than NOAEL when the continuous discharge from the WWTP and other sources are considered.

Low to high risks are associated with consumption of raw shellfish harvested at most of the exposure sites (13 out of 14 sites) during the 2-Yr Current ARI and the 10-Yr Current ARI scenarios. Following stormwater inflow reductions and drainage improvements (in the 10-Yr Future ARI scenario), overall predicted risks associated with raw shellfish consumption predominantly ranged from low to moderate.

While the risk assessment investigated the health risk occurring from overflow events when they occur, a key outcome of the DrainWise programme is to reduce the frequency of overflows. This reduction in the frequency of overflows (from approximately 2.5 per year currently to less than one every two years) will further reduce overall health risk by substantially reducing the likelihood/frequency of exposure. This is also relevant to longer-lived wastewater overflow derived pathogens in sediments; the reduced frequency of wastewater overflows will mean substantial reductions in time that there could be health risks due to pathogens in the water column or the sediments.

From a health risk perspective, results of this QMRA indicate that the proposed future changes delivered through GDC's DrainWise programme is a significant improvement over existing conditions.

Notwithstanding this significant reduction in risk over time, Streamlined Environmental recommend that Council should continue to advise that members of the public avoid the use of areas affected by wastewater overflows for recreational purposes and shellfish harvesting for several days after an overflow event or heavy rainfall as a key way of managing risk associated with overflows (both recreation and shellfish gathering). This is current practice, as detailed in Appendix F and G, and will be required to be implemented through appropriate conditions of consent.

Again, it is noted that the above assessment is based on a public health risk assessment, and not the cultural and social effects of contamination of fresh and marine waters and shellfish by wastewater.

6.8.5 Persistence of Pathogens in Sediment

The assessment of public health risk above did not assess the persistence of pathogens in sediment. As discussed in Section 7, engagement with technical and health experts indicated that pathogens that settle in the sediment may survive longer in the sediment than in water only, and hence remain viable and potentially affect health for longer periods of time. Therefore, health risks may last beyond the duration of the overflow event itself. The discharge point of the Tūranganui River, at the Cut, may be a depositional area for sediment and hence an appropriate area for additional investigations into health risk from pathogens in sediments.

Currently there is insufficient information on the duration of health risk associated with pathogens in sediment and Council is intending to undertake investigations into this to assess whether its health risk response and notifications (warnings for 5 days) is sufficient. However this does not alter the approach of this consent application to reducing health risk, which is to substantially reduce the frequency and volume of overflows.

6.9 Ecological Risk – Emerging Organic Contaminants

6.9.1 Introduction

Emerging organic contaminants (EOCs) are any synthetic or naturally occurring organic chemical that is not commonly monitored in the environment but has the potential to enter the environment and cause known or suspected adverse ecological and (or) human health effects. Major sources of EOCs include treated wastewater discharges, wastewater overflows, stormwater and landfill leachate.

EOCs encompass a large variety of chemicals. These include human and animal medicines (pharmaceuticals), antimicrobial disinfectants in soaps/shampoos, UV-filters in sunscreens, fragrances, pesticides, and those chemicals associated with industry (plasticisers, corrosion inhibitors, surfactants, flame retardants).

Wastewater overflows from the Gisborne network have the potential to cause ecological effects from EOCs in the marine receiving environment of Poverty Bay. Council contracted Streamlined Environmental Ltd to undertake a risk assessment of EOCs in wastewater overflows. Streamlined Environmental's report is attached as Appendix N, and their approach and key conclusions are summarised below.

6.9.2 Priority EOCs

Data on EOC concentrations in untreated influent (after pre-screening) from the Gisborne WWTP were used to prioritise 22 priority EOCs in the influent. A conservative approach was adopted, ranking of the prioritised list of EOCs for risk assessment based on the total concentration of EOCs in the influent (both the dissolved and particulate concentrations). This may potentially over-estimate the risk of some EOCs when comparing concentrations against ecological guidelines as some may be strongly bound to particulate material and therefore not be bioavailable.

6.9.3 Ecological Risk - Approach

Streamlined Environmental obtained the lowest available marine predicted no effects concentration (PNEC) for each of the priority EOCs. To estimate the ecological risk of the prioritised EOCs to the marine receiving environment (areas affected by the overflows are predominantly saline), hazard risk quotients were calculated for both mean and maximum influent EOC concentrations. The risk quotient is calculated by EOC concentration/PNEC concentration, with a value >1 indicating a potential ecological effect. In simplistic terms, the risk quotient is the dilution required to provide negligible ecological effects in the receiving environment.

MetOcean Solutions (2019) modelled a range of scenarios in order to describe the expected dispersion and dilution characteristics of stormwater discharges from the outfalls in the event of a discharge. Each of the simulations is unique in terms of the initial tidal state, forcing conditions (rivers, initial tidal states and wind) and discharge rates, and represents overflows resulting from the 2- and 10-year ARI rainfall events for the existing drainage scenario and overflows during the 10-year ARI rainfall event following the implementation of the DrainWise programme.

Time series dilution data at the 14 sites identified (see Figure 41 for locations) were supplied by MetOcean Solutions. Minimum, median and maximum dilutions at each site for scenarios under current 2-year ARI, current 10-year ARI and future 10-year ARI conditions were calculated 6 hours, 24 hours and 48 hours post wastewater discharge. Minimum dilutions (and therefore the higher expected range of concentrations of the substance) at each site under all scenarios and 6 hours, 24 hours and 48 hours post wastewater discharge were used for a worst-case scenario of EOC receiving environment calculations.

6.9.4 Assessment Results

Under the worst-case scenario (maximum EOC concentrations and minimum dilution) dilution by receiving environment water reduces the risk quotients of all EOCs at all modelled sites to <1 within 6 hours of discharge – a level that suggests negligible effects. Furthermore, greater dilutions 24 hours and 48 hours after discharge will further reduce risk quotients, and the associated potential for adverse effects.

There is still potential for bioaccumulation of some EOCs in marine species. Bioaccumulation concentration factors (BCF) may be used to estimate potential bioaccumulation of EOCs in biota, with a value >1,000 indicative of potential for bioaccumulation. Six EOCs have a BCF value above 1,000 and so are expected to bioaccumulate: technical nonylphenol (26,580); galaxolide (19,002); tonalide (13,834); methyl-triclosan (9,161); triclosan (4,270); and mestranol (1,059). Sixteen EOCs are not expected to bioaccumulate.

Even though some EOCs are expected to bioaccumulate there are no established analytical methods to measure them in biota and, there is a large knowledge gap of potential human health effects of EOCs in biota from which to establish whether there is a risk from consumption of these species[45].

6.9.5 Discussion and Conclusion

The assessment results, utilising conservative assumptions and worst case conditions, indicate that the risk of adverse ecological effects associated with EOCs carried in wastewater overflows is negligible (risk quotient <1) at all modelled sites within six hours of discharge.

There is still a potential for some (six of the 22 priority EOCs) to bioaccumulate within the receiving environment – although there are no established analytical methods to measure EOCs in biota and there is a large knowledge gap of the potential human health risks from consumption of these species.

It is noted that while there is an ongoing risk of bioaccumulation, GDC's implementation of the DrainWise programme will reduce both the frequency and volume of WWOs substantially. This programme aims to reduce overflow frequency, which is currently an average of 2.5 times per year, to less than once every two years. Similarly, overflow volume in a 10-year event is predicted to reduce from 17,849 m^3 to 1,545 m^3 and 25,782 m3 to 8,010 m^3 for the Wainui and Peel Street overflows respectively, following the successful implementation of the DrainWise programme. So while an overflow event will result in EOCs being discharged, and hence the potential for bioaccumulation to occur with some of the EOCs, the load of EOCs discharged via overflows will be reduced substantially over time, and will significantly reduce the rate at which any bioaccumulation occurs.

6.10 Natural Character

Natural character is a term which can be used to describe the naturalness of an environment and has both ecological and landscape elements.

An assessment of the natural character of Gisborne's rivers was previously undertaken on behalf of Council using the River Values Assessment System. The River Values Assessment System (RiVAS) was applied by a River Expert Panel to eight resource attributes to assess 61 river units in the Gisborne District for their natural character and identify those of high, moderate and low natural character.

The four main urban rivers were assessed as follows:

Waimata:	Moderate
Tūranganui River:	Low
Taruheru River:	Low
Waikanae Stream:	Low

[45] Appendix N, Page 2

In respect of the Bay, the Wherowhero/Waipaoa Estuary is identified as a Marine Area of Significant Conservation Value in the TRMP[46] with the key coastal interface issues identified as:

"Protection of the communities and associations of all indigenous species of flora and fauna and their habitats. Protection of the high standard of water quality, natural character and the linkages between terrestrial, freshwater and marine ecosystems. Preservation of the natural character of this coastal environment."

In respect of the potential impacts of wastewater overflows on the natural character on Gisborne's urban rivers and the Bay, these are considered to be minor and temporary as:

- The rivers have been identified as having moderate or low natural character values and due to the substantial modification that occurs in an urban environment, it can be expected that the urban reaches of these rivers would typically have lower natural character values than more natural reaches.
- Past and current wastewater overflows have been assessed as having minimal effects on the estuarine ecology.
- Wet weather overflows only occur infrequently (average of 2.5 times per year) in heavy and prolonged rain events and are short term. These large rain events carry significant sediment and contaminant loads from up-catchment areas and urban stormwater that will dominate visual and other impacts.
- Dry weather overflows are relatively infrequent, typically small and most do not reach waterways.

In respect of the potential for adverse effects on the character of the Wherowhero/Waipaoa Estuary. The hydrodynamic modelling (Appendix J) indicates that WWOs may be dispersed throughout the Bay during a large (10-year ARI) rain event under current stormwater and wastewater drainage.

However, it is highly dispersed and diluted at the point at which it reaches the estuary and effects on natural character are likely to be less than minor – particularly given the large flows and contaminant (sediment and other contaminants from rural activities) loads discharged from the large Waipaoa Estuary during such a significant rainfall event.

Following the implementation of the DrainWise Programme, overflow discharges (both frequency and volume) will be substantially reduced, further reducing the potential for any adverse effects on the natural character of the rivers and the Wherowhero/Waipaoa Estuary.

6.11 Cultural Effects

Tūranganui-a-Kiwa tangata whenua uniquely identify (in terms of cultural, spiritual, historical and traditional association) to the three main rivers that traverse the Tūranga (Gisborne) urban area – converging to flow to the ocean. These are the following rivers:

- Waimata;
- Taruheru;

[46] G22 Schedule : Marine Areas of Coastal Significance as Defined in the Coastal Environment Plan

- Tūranganui;
- Waikanae.

They also associate with Tūranganui-a-Kiwa (Poverty Bay), its beaches and associated environments

An assessment of tangata whenua values and the cultural effects of wastewater overflows has been undertaken by the KIWA Group in their Engagement Report (Appendix L). Detail of the group members and engagement process is provided in Section 7, together with the KIWA Group's recommendations.

Tangata whenua in Tairāwhiti have a long history of grievance in terms of wastewater, and have strong relationships with their awa and moana. Both wastewater and non-wastewater issues affect tangata whenua wellbeing and relationships with the rivers, coastal environments, and the bay.

In terms of the current state of the receiving environment, tangata whenua note that there are many non-wastewater issues that cause negative cultural impacts, including broader catchment issues, land transformation and developments, the effects of colonisation, a lack of governance structure and process that fully realise true partnership, participation, and protection. None of these issues are considered to reduce any of the tangata whenua wastewater concerns identified through the process undertaken by the KIWA Group.

The cultural effects of wastewater overflows, as identified by the KIWA Group are summarised below. The KIWA Group's assessment was predominantly focussed on the cultural effects of WWOs, however their report also considered additional information on the effects of DWOs.

- The practice of allowing wastewater overflows is abhorrent to tangata whenua - it encroaches upon core fundamental principles of customary social and spiritual rights and practises, and it affects them deeply spiritually, socially, and culturally. The KIWA Group recognised that after achieving performance of an average of 1 overflow every 2 years, there would be an improvement, however the overarching tapu of mixing wastewater with natural water and 'chronic' issue of tapu would remain. Overall tangata whenua supported the reductions but indicated their aim is the elimination of all wastewater overflows.
- The wastewater overflows significantly diminish tangata whenua wellbeing. However, tangata whenua see the reduction in the number of wastewater overflow events and associated wastewater volumes as resulting in a shorter duration of negative effects, but the 'chronic' issue of tapu would remain. Further, human wastewater discharges are tapu, and their effects cannot be measured appropriately in western science terms. Based on the overflow reduction proposed, tangata whenua wellbeing would be improved, but only partially. The less frequent overflows would still impact on tangata whenua wellbeing. The KIWA Group identify the need for better monitoring of cultural effects and the integration of tikanga and mātauranga Māori into Council processes as having the potential to contribute towards improvements in wellbeing.
- Wastewater overflows have a significant negative impact on the mauri of affected waterbodies - this is felt by all tangata whenua, and in respect of wastewater overflows in Tairāwhiti, particularly by local iwi and hapū with intrinsic and historical connections to these waterbodies. A reduction in wastewater overflows, in combination with integration of tikanga, mātauranga māori, and Māori values into Council management of overflows, will reduce impacts on tangata whenua.

- While the cultural significance of the water bodies is without doubt known, valued, and respected by tangata whenua, the overall iwi and hapū connections to these waterbodies and whakapapa (cultural identity) have been significantly diminished on account of the wastewater overflows - the status quo makes tangata whenua feel alienated, estranged, and aggrieved
- Wastewater overflows produce significant negative effects for tangata whenua, directly impacting on key cultural practises. In particular the KIWA Group state that able to operate in accordance with and across the full breadth of tikanga has been impossible for tangata whenua because of the overriding effects of wastewater overflows – wastewater overflows militate against interacting meaningfully with these waterbodies. The KIWA Group advise that a reduction in wastewater overflows, in combination with integration of tikanga into Council management of overflows, may result in some improvements in tikanga practices. But the full breadth of tikanga requires a more significant change. This change would result in a shorter duration of negative effects, but the 'chronic' issue of tapu would remain.
- The spiritual health of the waterbodies, wairuatanga, is greatly affected by wastewater overflows, and tangata whenua's spiritual practices, protocols, and associations with the awa and moana have been greatly undermined - this has been exacerbated by mortuary wastewater within the wastewater overflows. The KIWA Group advise that mortuary wastewater must be removed from the conventional wastewater system.
- Mahinga kai, in respect of customary practices and protocols of a Marae community, is essentially no longer carried out on the waterbodies affected by the wastewater overflows; the water bodies are generally considered unfit for gathering kai for tangi, hui, and in expressing manaakitanga to manuhiri, kaumātua and whānau members, mostly because of the spiritual impacts of wastewater discharges. A reduction in wastewater overflows, in combination with integration of tikanga in respect of overflows, may reduce impacts on tangata whenua. The possibility exists that after long periods of time post-wastewater overflow event that mahinga kai could be practised – but this needs to be considered by tangata whenua in a mātauranga Māori approach. This change would result in a shorter duration of negative effects, but the 'chronic' issue of tapu would remain. The elimination of mortuary wastewater from the conventional wastewater system is an absolute requirement before mahinga kai practices can be considered. Overall, tangata whenua support the reductions but reiterate their view that the aim must be to eliminate wastewater overflows.
- These challenges in exercising customary rights and practices in the awa and moana are also borne out in negative impacts on whānaungatanga, with the nature and quality of relationships within and between whanau, hapū and iwi no doubt reduced because of the diminished state of these substantial elements in Māori culture. The fact that overflows still do occur, albeit less frequently, will significantly diminish the possibilities for use of wai resources in expressing whānaungatanga.
- While some parts of the waterbodies are still used by tangata whenua for collecting kai, this is generally as individuals and whanau and not as hapū and iwi collectives, and this is done reluctantly and often out of necessity. Māori have historically and continue today to rely on the awa and moana for food and materials, and harvesting kai is part of the cultural identity and fabric of Māori communities - wastewater overflows have substantially negatively affected this integral component of tangata whenua life, affecting this fundamental element of tangata whenua life. The KIWA Group see that the reduction in overflow frequency and volume will provide a substantial improvement for

tangata whenua. This would however depend on appropriate tikanga processes, including placement and lifting of rahui, and application of a Te Ao Māori lens in monitoring and notification processes. This change would result in a shorter duration of negative effects, but the 'chronic' issue of tapu would remain.

- A reduction in overflows should reduce Māori concerns regarding use of the waterbodies, bit it will not eliminate the concerns, particularly those related to human wastewater. This would however depend on appropriate tikanga processes, including placement and lifting of rahui, and application of a Te Ao Māori lens in monitoring and notification processes.
- The KIWA Group advise that the role of tangata whenua as kaitaki, with mana whenua (authority), has not been acknowledged, recognised and provided for in respect of management of wastewater overflows. The reduction in overflows will only improve this if tikanga, mātauranga Māori, and Māori values are integrated into Council management of overflows, with participation of tangata whenua in wai management.

Tangata whenua for various reasons consider themselves unable to effectively fulfil their role as kaitiaki in terms of wastewater overflows into the city's rivers.

The KIWA Group made a number of recommendations which would help to reduce the cultural effects of wastewater overflows (see Section 7). These have been acknowledged and addressed through the proposed consent conditions, outlined in section 9.

Overall, the KIWA Group conclude that Council's proposed reduction in wastewater overflows is considered as a step in the right direction, however tangata whenua will continue to object to wastewater overflows, the desire being to work with Council to achieve total elimination of wastewater overflows.

In summary, although the consent will result in an improvement to the current effects faced by tangata whenua, these cannot be eliminated and the continued discharge of wastewater to water will continue to result in significant adverse effects on cultural values.

7 CONSULTATION

7.1 Iwi Engagement

7.1.1 KIWA Group

Council partnered with the KIWA Group to undertake tangata whenua consultation. The KIWA Group was mandated to undertake this work through Council's Wastewater Management Committee (WMC). Members included:

- Ian Ruru – Te Rūnanga o Tūranganui a Kiwa (TROTAK);
- Ray Farmer - Te Aitanga-a-Māhaki;
- Joanne Pere - Te Aitanga-a-Māhaki;
- Karena Toroa - Ngai Tāmanuhiri;
- David Hawea - Te Whānau-a-Kai;
- Keith Katipa - Te Whānau-a-Kai;
- Owen Lloyd - Ngā Ariki Kaiputahi;
- Matawhero Lloyd - Ngā Ariki Kaiputahi;
- Samuel Lewis – Rongowhakaata;
- Murray Palmer – Rongowhakaata;
- Dianne Irwin – Ngāti Oneone;
- DJ Irwin – Ngāti Oneone;
- Wolfgang Kanz – Gisborne District Council.

The purpose of the KIWA Group is to provide expert cultural and technical advice as directed by Council's Wastewater Management Committee to support the development of wastewater management in Gisborne. The KIWA Group has been engaged in a technical sense, as representatives of Tūranganui-a-kiwa iwi and hapū, for their expert cultural input and guidance.

An intensive engagement process was followed, with the intention of working together with relevant iwi and hapū to enable accurate and comprehensive assessment and reporting on the effects of wastewater overflows on tangata whenua.

This work focussed on tangata whenua values and perspectives, with dialogue between iwi, hapū and Council. Western science knowledge, values and perspectives also formed part of these discussions, primarily as supporting information within a mātauranga context. Tikanga and mauri were key points of discussion in respect of wai Māori and wastewater (waikino). The engagement process was supported in a practical sense through previous reports and use of the Mauri Compass (an environmental health assessment tool, used in this instance to identify and measure through collective engagement the effects of wastewater overflows upon tangata whenua and their customary rights and practises), used in this instance to promote korero and assessment.

Both wastewater and non-wastewater issues affect tangata whenua wellbeing and relationships with the rivers, coastal environments, and the bay. The wastewater overflows effects are discussed in Section 6.11 and summarised as below:

- The practice of allowing wastewater overflows is unacceptable to tangata whenua - it encroaches upon core fundamental principles of customary social and spiritual rights and practises, and it affects them deeply spiritually, socially, and culturally.
- Wastewater overflows produce significant negative effects for tangata whenua, directly impacting on key regulatory cultural practises, rendering it near impossible to apply fundamental processes that would return the waterbody to a safe balanced state.
- While the presence of human wastewater within a natural water environment is repugnant to tangata whenua ethics and values, the addition of mortuary wastewater is absolutely abhorrent both physically and spiritually.
- Tangata whenua consider themselves unable to effectively fulfil their role as kaitiaki in terms of wastewater overflows into the city's rivers.
- While GDC's proposed reduction in wastewater overflows is considered as a step in the right direction, tangata whenua will continue to object to wastewater overflows, the desire being to work with Council to achieve total elimination of wastewater overflows.
- There are many non-wastewater issues that affect tangata whenua with negative cultural impacts, including broader catchment issues, land transformation and developments, the effects of colonisation, a lack of governance structure and process that fully realise true partnership, participation, and protection. None of these issues reduce any of the wastewater concerns identified through this process.[47]

The KIWA Group provided the following key recommendations:

- Tangata whenua need to be engaged on an ongoing basis moving forward, in a meaningful, authentic, and practical manner; this engagement reports reflects the Tangata Whenua the position at a point in time, and systems need to be put in place to ensure changes over time are addressed.
- All possible avenues must be explored to bring forward the DrainWise Implementation Programme, including seeking alternate sources of funding and approaching the Trust Tairāwhiti (formerly the Eastland Community Trust), and involving tangata whenua in those discussions.
- Tangata whenua should be provided with opportunities to work alongside Council to resolve these issues.
- Monitoring related to wastewater overflows should be reviewed to include cultural elements, and make the monitoring relevant to kaihoe waka, shellfish gathering, and other Māori resource-use practices.

[47] Te Whānau-a-Kai reviewed the above bullet point and provided the below:

"There are many non-wastewater issues that affect Tangata Whenua with negative cultural impacts, including broader catchment issues, land transformation and developments, the ongoing effects of colonisation, a lack of governance structure and process that that fail to recognise the Treaty of Waitangi. These issues have little effect on the wastewater concerns identified through this process."

- Current public health monitoring procedures and locations should be reviewed to make sure they adequately capture health risks.
- Management protocols related to dry and wet weather overflows should be reviewed by the KIWA Group, integrating tikanga aspects such as the placement of rahui and other processes.
- Tangata whenua need to be kept informed on the DrainWise Implementation Programme, and be given opportunities to input.
- Projects to improve mauri should be identified, rectified (implemented) and then ongoing protection provided.

These recommendations are reflected in the conditions of consent presented in Section 9. In particular through the establishment of a Tangata Whenua Reference Group (Conditions 14 to 17) to provide a forum for on-going advice and input into the implementation of the consent (and other matters) and through a Tangata Whenua Cultural Monitoring Plan (Condition 7).

Māori have stated they hope that this engagement process sets a platform for iwi and hapū to better influence change and work together more with Council, to make sure the required solutions to the problem are delivered, and the wastewater outcomes are achieved.

7.1.2 Marine and Coastal Areas Act

In accordance with sections s62(2)-(3) of the Marine and Coastal Areas Act (MACA), Council has sought the views of all parties who have applied for Customary Marine Title (CMT) in the area potentially affected by overflows. These letters are attached at Appendix O. At the time of lodgement, no responses were received.

7.2 Targeted Stakeholder Engagement

On 6 May 2020, two wastewater overflow information sessions were held with key stakeholders via Zoom. Attendees included:

- Group 1 (Water User Groups):
  - John Wells –Gisborne Yacht Club;
  - David Corrin –Midway Surf Club;
  - Walton Walker –Horouta Waka Ama;
  - Flo Bub -Gisborne Board Riders Club.
- Group 2 (Technical Group)
  - Cathy Walker – Health Protection Officer - Hauora Tairawhiti;
  - Wanita Tuwairua-Brown - Health Protection Officer Trainee - Hauora Tairawhiti;
  - Eben Herbert – East Region, Fish and Game Council;
  - Murray Palmer – Environmental consultant and Rongowhakaata Representative;
  - Marty Bayley –Eastland Port;
  - Manu Graham -RMA Planner – Department of Conservation;
  - Samuel Lewis – Rongowhakaata Representative.

Attendees were provided with information sheets prior to the meeting (attached at Appendix P) and a short PowerPoint presentation was delivered, followed by a question and answer session. Meeting notes are attached at Appendix Q.

Overall, the meetings provided a useful forum to clarify the scope and nature of the consent application. In terms of key actions, Council has worked directly with the Gisborne Board Riders Club to improve its overflow warning systems to be more inclusive and collaborative.

7.2.1 Technical Session – Ecology and Public Health

On 5 May 2020, Council had a virtual technical session with Ian Ruru (KIWA Group Chairman), Murray Palmer (Nga Mahi Te Taiao) and Dr Bruce Duncan (Duncan Health) to discuss the QMRA. At this meeting, a number of matters were raised which are summarised below:

- The QMRA does not address potential longer-term risks due to the persistence of pathogens (including viruses) in sediments, and re-suspension of sediments.
- Pathogens settle in the sediment, they survive longer in the sediment than in water only, and they remain viable and still affect health for longer periods of time.
- The end of the Tūranganui River, at The Cut, may be a depositional area for sediment, and going forward it would be worthwhile doing additional investigations into health risk from these sediments.
- Public health risks are not just present at the beaches, but also the rivers.
- Faecal source tracking was discussed as a means to better understand the relative risks of human versus animal-derived pathogens.
- From an ecological perspective, rivers affected by wastewater overflows have been heavily impacted by sediment (muddiness) and habitat transformation.

7.3 Public Consultation/Engagement

7.3.1 Long Term Plan

The DrainWise programme is identified as a 'major project' in Council's 2018-2018 LTP. Significant community consultation was undertaken to determine the preferred option. Of the 993 submission points raised through submissions to the LTP, 93 were specific to the DrainWise programme.

The majority of submitters (76%) supported Council's preferred option (and provided no further comment). Following the LTP hearings, Council approved the preferred option for inclusion in the LTP. This means:

"Council will continue to replace its aging pipe network, increase maintenance on its network, and fund 40% of the fixes required to remove flooding on private property where the flooding is a result of multiple contributing properties and would be unreasonable to undertake enforcement on the greatest affected property only. For the remaining properties, we will be relying on the owners to pay for their repairs but Council will look to alternative funding options or ways to reduce the financial impact to those owners." (Source: GDC Submission Full Details with Response by Submitter for Long Term Plan 2018-2028).

Other key themes that came out of the submissions included:

- Further education/awareness work is recommended. This has occurred through the DrainWise Programme and, more recently, through information sheets in respect of this resource consent application.
- Continue to seek alternative funding to assist low-income property owners or alternative funding and enforcement mechanisms. As discussed in Section
- Policy should include a plan showing the end-stage for the elimination of WWOs to the rivers. The initial target is progressively improve performance to achieve no overflows in a 50% AEP event. Further targets may be considered once that is achieved.
- Consider an Independent Panel, including technical experts and community members, to provide oversight and advice during this Project. It is considered that the primary issues are well understood such that an independent technical advisory panel is not required. However, a high level of transparency and reporting is proposed to ensure that the community are well informed of progress.

7.3.2 DrainWise

Council's DrainWise programme is about working together with property owners to help fix problems with wastewater and stormwater drains. The programme is supported by a 2018/28 Long Term Plan budget of $20.8 million over 10 years.

A community awareness and education programme was commenced by Council in January 2019 and this is ongoing. The aim of the campaign was to *'inform and challenge the people of Te Tairawhiti about wastewater discharges and drainage issues in the Gisborne district'*. This included information dissemination through a range of forums and media, including:

- Updates to the DrainWise page on Council's website, including two new pages called 'what we've done' and 'what we're doing' which can be easily updated as progress is made;
- A five part mini-series which sought to ensure the community understood the causes of our wastewater discharge problem and also how they could be part of the solution to control it. The series was made up of five separate key messages which were derived from the 2016 DrainWise plan. These five messages covered the following themes: Only flush the 3 Ps; Stormwater and wastewater don't mix; Sinks aren't rubbish bins; Get to know your gully trap; and Healthy water, healthy community. Each key message was woven together by scripted dialogue from members of the community using sharp, no-nonsense graphics and confronting images, with strong calls to action.
- Additional communication channels used to promote the key messages included the GDC Facebook page, GDC website, full page adverts and separate inserts in the Gisborne Herald, six large billboards strategically placed around the city, flyers distributed via mail drop box and at community events as well as event participation and radio station interviews.
- A DrainWise Art competition for kids and local artists – with designs painted on Gisborne footpaths to raise awareness of stormwater pollution.

As recorded in the DrainWise Awareness & Education Campaign – Final Report (prepared by Hinemihiata Lardelli, 2019 – Appendix R), data both anecdotal and statistical, showed the campaign was extremely well received by the community. This report also includes recommendations for further work to reinforce the key messages.

In addition, Facebook data shows the five-part mini-series was very successful in its reach (views) and in terms of engagement (reactions, comments and shares). A snapshot of the posts and associated performance (as at 28/05/2020) is provided below in Figure 42 and Figure 43.

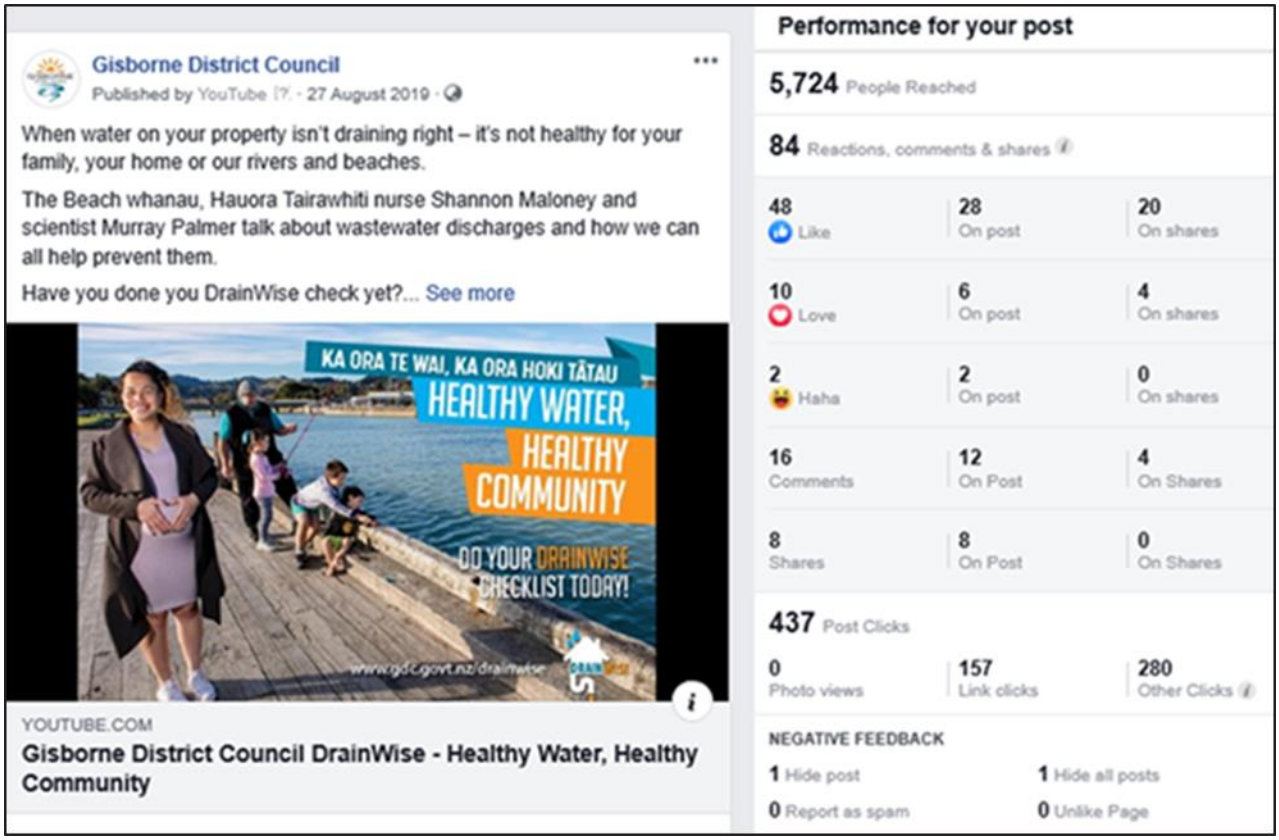
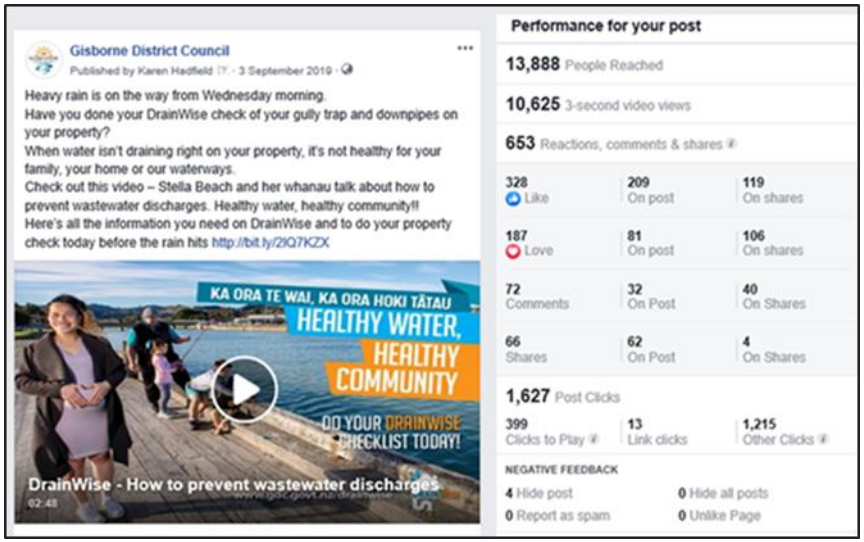
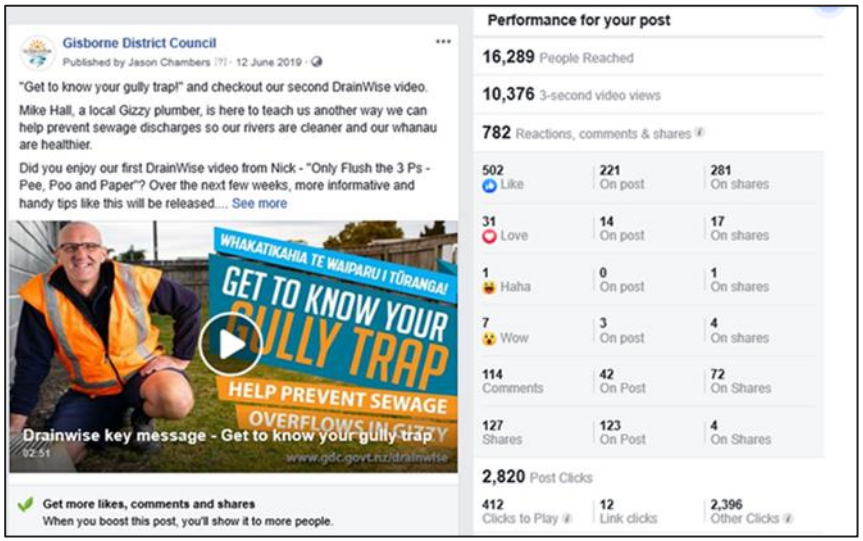


Figure 42: DrainWise Mini Series Post - Have You Done Your DrainWise Check?





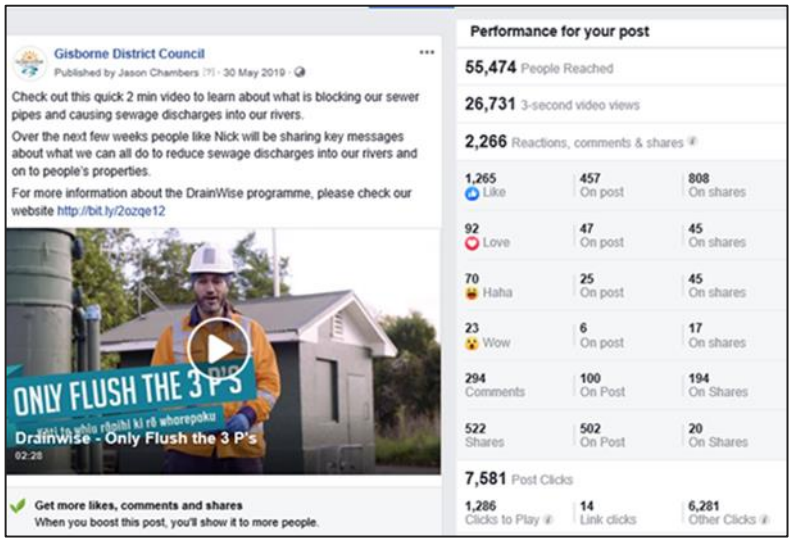


Figure 43: DrainWise Mini Series Posts

As evidenced by these report summaries this information series has been viewed by a large number of people, with one post achieving more than 55,000 views and the attached video more than 26,000 plays. This level of interest demonstrates the importance the community places on the management of the wastewater and their role in contributing to this management.

7.3.3 Other Engagement

As part of this consent application, information sheets summarising what causes overflows (wet and dry weather), what Council is doing to reduce overflows, and key challenges and opportunities have been added to the Gisborne District Council website, along with the ability to provide feedback (via online form or to the DrainWise email): https://www.gdc.govt.nz/resource-consent-for-wastewater-overflows/. A link to this information and request for feedback was also circulated in Council's He Panui (online newsletter).

As at 08/06/2020 feedback has been received from six individuals/organisations. A summary of the key themes/comments relating to effects or improvements are provided below:

- Overflows affect people's ability to use the rivers.
- Concerns with effects of overflows on the rivers and seas.
- The situation (frequency of discharges) doesn't seem to be improving.
- Council needs to be directed to fix the problem and should publicise the causes of overflows and get citizen buy-in to alleviate the problem.
- The state of the wastewater and stormwater drainage systems for each property should be recorded on Land information Memorandums (LIMs) so buyers are aware of any issues and the likelihood of a required fix, and any associated costs. This may also mean sellers are forced to commit to repairs prior to the sale or will share the cost with the purchaser, eventually lessening the problem.
- Consider use of dye to check stormwater pipes and cross connections.
- Council should consider requiring a filter on private property sewer pipes so the problem and associated cost to clean the filter is on the private property owner.
- There are commercial industries such as the Rock Lobster Industry which can be affected by land based pollution events. Any works Council takes to reduce planned and unplanned wastewater overflows that could enter the marine environment are supported.

7.4 Summary

In summary, engagement has been undertaken with tangata whenua to help understand the effects of wastewater discharges on Māori cultural values and also to establish a working relationship to enable tangata whenua to contribute to and be involved in the implementation of the wastewater overflow consent. Council is committed to continuing this relationship and conditions of consent have been proposed to ensure that this occurs.

Wider community and stakeholder engagement has also occurred, particularly through the DrainWise programme and more recently through consent related information. The high level of interest shown in the DrainWise resource material demonstrates the importance the community places on wastewater issues.

8 STATUTORY MATTERS

8.1 Activity Status

Consent for wastewater overflows is required under the TRMP. The application is to authorise overflows, subject to a range of actions and measures that seek to progressively reduce overflow frequency, volume and risk.

Consent has been sought for the following activities:

- The point source discharge of untreated sewage/wastewater, resulting from overflows from wastewater reticulation, during wet weather to land or freshwater.

  Consent for this activity is sought as a **restricted discretionary activity** under Rule 6.2.3(10) of Part C6 of the TRMP.
- The point source discharge of untreated sewage/wastewater, resulting from overflows from wastewater reticulation during dry weather, to land or freshwater.

  Consent for this activity is sought as a **non-complying activity** under Rule 6.2.3(15) of Part C6 of the TRMP.
- The point source discharge of untreated sewage/wastewater, resulting from overflows from wastewater reticulation in both dry and wet weather, to the coastal marine area (CMA).

  Consent for this activity is sought as a **non-complying activity** under Rule 2.6.2(6) of Part D of the TRMP.

Overall, consent is sought as a **non-complying activity**.

8.2 Notification

Council as applicant requests that the application be publicly notified.

8.3 Summary of Relevant Statutory Instruments

The statutory instruments of most relevance to the overflows consent are:

- The RMA and relevant National Policy Statements prepared under it, notably the:
  - National Policy Statement for Freshwater Management (2017) (NPSFM);
  - New Zealand Coastal Policy Statement (2010) (NZCPS);
  - National Policy Statement on Urban Development Capacity (2016) (NPSUDC).
- Marine and Coastal Area (Takutai Moana) Act 2011.
- Ngā Rohe Moana o Ngā Hapū o Ngāti Porou Act 2019.
- Gisborne's statutory document, the:
  - Tairāwhiti Resource Management Plan (TRMP), which is essentially a 'one plan' incorporating the Regional Policy Statement, regional plan provisions and regional coastal plan provisions.
- S104(1)(c) matters including Statutory Acknowledgements and Iwi Management Plans.

A brief overview of these instruments and key provisions is provided below. A detailed assessment of the application against the relevant objectives and policies of the national policy statements and TRMP is provided in Appendix S.

8.4 RMA Part 2

The purpose of the RMA is to achieve the sustainable management of natural and physical resources. Natural resources include by definition, land, water, air, soil, minerals and energy, and all forms of plants and animals. The wastewater network is a physical resource of regional significance given its role in providing for the health, safety and economic development of Gisborne city.

Sections 6, 7 and 8 of the RMA set out the matters to be considered in achieving the purpose of the RMA.

These sections outline:

1) The matters of national importance that must be recognised and provided for (s6);

2) Other matters to which particular regard must be had (s7); and

3) The requirement to take into account the principles of the Treaty of Waitangi (s8).

An assessment against Part 2 has been undertaken for the following reasons:

- For completeness purposes; and
- Given the age of the coastal provisions in the TRMP (which have not been updated to give effect to the NZCPS 2010).

8.4.1 Section 5 - Purpose

The purpose of the RMA is to promote the sustainable management of natural and physical resources. Sustainable management is defined in section 5(2) as:

(2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—

(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and

(b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.

The wastewater network is essential regional infrastructure. An effective and efficient wastewater network is fundamental and core infrastructure supporting an urban environment by transporting wastewater away from homes, commercial activities and industries and providing for its treatment and disposal.

Gisborne's wastewater network has expanded and been significantly improved over time to meet the needs of a growing city and changing community and cultural expectations. As with all wastewater (and drainage) networks, this continual process of expansion and improvement is on-going, in order to meet

the foreseeable needs of future generations and to provide for the health and well-being of the community.

The proposed approach to wastewater overflow management, and conditions of consent set out the management framework for overflow events, seeks to protect natural and physical resources and the health and safety of communities. Finally, through these proposed consent conditions, the potential adverse effects caused by the overflow events on the environment and to human health are avoided (where possible) or mitigated.

8.4.2 Section 6 – Matters of National Importance

Section 6 of the RMA addresses matters of national importance that shall be recognised and provided for. The following matters are considered relevant to this proposal:

(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:

(c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:

(d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:

(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:

(g) the protection of protected customary rights:

The proposal recognises and provides for the preservation of the natural character of Tairāwhiti's coastal and freshwater environments. The discharges are temporary and transient, and as discussed in Section 6, are unlikely to affect identified areas of high natural character. Importantly, the proposal is to reduce overflow frequencies and volumes through a process of progressive improvement such that any minimal effects on natural character will be less as a result of the application and the management processes it includes.

In respect of significant indigenous vegetation and significant habitats of indigenous fauna, the receiving environments are highly modified watercourses and none are identified as being significant. While indigenous fauna are present in some watercourses, the ecological assessment provided in Appendix H concludes that adverse effects on ecology are no more than minor – and any effects will reduce as overflows are progressively reduced.

Access to Gisborne's rivers and the CMA during and post an overflow event may be limited for a temporary duration to manage public health risk. Progressive overflow reduction will reduce how often this occurs due to wastewater overflows from an average of 2.5 time per year to approximately once every two years.

Engagement with tangata whenua has confirmed that the practice of allowing wastewater overflows is unacceptable to tangata whenua as it affects them deeply spiritually, socially, and culturally. The

wastewater overflows have a significant negative effect on tangata whenua, in terms of cultural identity, mauri, tikanga, wairua, kaitaikitanga, the practice of customary rights and protocols, and substantially diminishing or making it impossible to practice some fundamental elements of Māori society and culture. Human wastewater, particularly containing mortuary wastewater, mixing with natural water is tapu for tangata whenua.

At the same time it is noted that the reduction in wastewater overflows proposed by Council will improve the current situation and tangata whenua advise that they will continue to object to wastewater overflows and seek to work together with Council with the objective of eventually eliminating overflows. Council is committed to working with tangata whenua, and the wider community, to progressively reduce overflows. Conditions of consent have been proposed that include establishing a Tangata Whenua Reference Group, and working together to include cultural elements into monitoring programmes and to advise on overflow response protocols in respect of tikanga aspects such as the placement of rahui.

As such, the relevant RMA s6 matters have been recognised and provided for.

8.4.3 Section 7 - Other Matters

Under section 7 of the RMA, the following "other matters" are considered relevant:

(a) kaitiakitanga:

(b) the efficient use and development of natural and physical resources:

(c) the maintenance and enhancement of amenity values:

(d) Intrinsic value of ecosystems:

(f) maintenance and enhancement of the quality of the environment:

(i) the effects of climate change:

Particular regard has been had to these matters. In summary:

- In terms of kaitiakitanga, as indicated above, engagement with tangata whenua has been undertaken, and conditions of consent have been proposed to address matters raised by the KIWA Group and providing avenues for Maori to exercise kaitiakitanga.
- The wastewater network is a substantial and essential drainage network and a physical resource of critical significance to Gisborne. Its efficient and effective operation (while mitigating adverse effects) is essential. It is designed/sized to current best practice and currently operates at a level that is consistent with best national practice. Future improvements through physical network upgrades, as well as Council's programme of progressive reduction of stormwater inflow and infiltration (targeting high impact areas first) will continue to improve performance and represents the most cost effective, efficient and enduring way of reducing overflows.
- The progressive reduction in overflow events (and associated duration and volume), reduction in overflow points, as well as Council's response procedures, seek to mitigate effects amenity values and the quality of the environment, acknowledging that the amenity and quality of the existing receiving environment (particularly in wet weather events) may be impacted even in the absence of overflows as discussed in Section 5.

- The wastewater network design and overflow performance measures and targets take into account anticipated climate change projections by ensuring that all stormwater and wastewater network modelling (and sizing of new/upgraded infrastructure) take into account the impacts of climate change.

8.4.4 Section 8 – Treaty of Waitangi

Section 8 of the RMA requires:

> *In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).*

In preparing this consent application, the principles of the Treaty have been taken into account. Engagement has been undertaken with tangata whenua and the proposed conditions of consent seek an on-going relationship throughout the implementation of the consent.

8.5 National Policy Statement for Freshwater Management 2014 (Updated 2017)

The NPSFM provides guidance to the considerations and expectations for freshwater management within New Zealand. It seeks to maintain or improve the overall quality and quantity of freshwater resources and maintain the life supporting capacity of freshwater resources. Of particular relevance are the following objectives[48]:

- Objective AA1: To consider and recognise Te Mana o te Wai in the management of fresh water.
- Objective A1: To safeguard:
  - the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and
  - the health of people and communities, as affected by contact with fresh water;

  in sustainably managing the use and development of land, and of discharges of contaminants.
- Objective A2: The overall quality of fresh water within a freshwater management unit is maintained or improved while:
  - protecting the significant values of outstanding freshwater bodies;
  - protecting the significant values of wetlands; and
  - improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated.
- Objective A3: The quality of fresh water within a freshwater management unit is improved so it is suitable for primary contact more often, unless:
  - regional targets established under Policy A6(b) have been achieved; or
  - naturally occurring processes mean further improvement is not possible.

[48] These are provided in full in Appendix S.

- Objective C1: To improve integrated management of fresh water and the use and development of land in whole catchments, including the interactions between fresh water, land, associated ecosystems and the coastal environment.
- Objective CA1: To provide an approach to establish freshwater objectives for national values, and any other values, that:
  - is nationally consistent; and
  - recognises regional and local circumstances.
- Objective D1 To provide for the involvement of iwi and hapū, and to ensure that tangata whenua values and interests are identified and reflected in the management of fresh water including associated ecosystems, and decision making regarding freshwater planning, including on how all other objectives of this national policy statement are given effect to.

The Freshwater Chapter (C6) and Waipaoa Catchment Plan Chapter (DF1) of the TRMP regulates discharges and activities which impact on the water quality of water resources in the Gisborne region. The TRMP creates a requirement to maintain or improve water quality, and where water quality is degraded, to improve water quality to at least the National Bottom Line – or to meet the Objectives, Targets and Limits set in Catchment Plans. The only Catchment Plan currently in place is the Waipaoa Catchment Plan.

The primary spatial area for managing fresh water within a catchment is the Freshwater Management Unit (FMU). Values are identified at the FMU level and objectives and limits are set to reflect these values. Furthermore, the consideration of overall water quality is assessed across the whole of each FMU. The Waipaoa Catchment is made up of four FMUs. The Gisborne FMU is relevant to this application. This is assessed below.

The application and on-going operation and management of the wastewater network is considered to be consistent with the over-arching objectives of the NPSFM. In particular:

- It is an existing discharge and the aim is to progressively reduce wet weather wastewater overflows and manage dry weather overflows to a practicable minimum, hence maintaining or improving the overall quality of fresh water;
- Similarly, the application seeks to improve the quality of fresh water within a freshwater management unit so it is suitable for primary contact more often;
- Tangata whenua values and interests have been identified through engagement and reflected in conditions of consent.

8.6 New Zealand Coastal Policy Statement 2010

No direct discharges of wastewater from the network to the CMA are anticipated. There are no formal overflows points that direct wastewater to the CMA and, as the wastewater network is 'land based', dry weather overflows from the network are extremely unlikely to be discharged directly to the CMA (without having first passed over land or via a river). However, the NZCPS is still of relevance to this application as overflows do (or can occur in terms of dry weather overflows) discharge into the *coastal environment*.

Although the coastal provisions of the TRMP have not been updated to give effect to the NZCPS, it is acknowledged that the more recent freshwater provisions of the TRMP (developed under the NPSFM),

have also taken into account the NZCPS. These provisions provide an integrated approach to managing across the freshwater and coastal water interface.

The NZCPS provides guidance for managing the effects of land use and discharges on the coastal environment. The NZCPS includes the objective of safeguarding *"the integrity, form, functions and resilience of the coastal environment and sustain its ecosystems … by ….maintaining coastal water quality and enhancing it where it has deteriorated from what would otherwise be its natural condition, with significant adverse effects on ecology and habitat, because of discharges associated with human activity"*.

In respect of the discharge of contaminants, the NZCPS acknowledges that wastewater (alongside stormwater) is a key contributor to adverse effects in coastal waters. The NZCPS seeks to manage discharges to the coastal environment, having regard to a range of factors including the sensitivity of the receiving environment, the capacity of the receiving environment to assimilate contaminants and avoiding significant adverse effects on ecosystems. In achieving this the NZCPS sets several directive policies of relevance to wastewater including:

- Policy 21 Enhancement of water quality

  Where the quality of water in the coastal environment has deteriorated so that it is having a significant adverse effect on ecosystems, natural habitats, or water-based recreational activities, or is restricting existing uses, such as aquaculture, shellfish gathering, and cultural activities, give priority to improving that quality by:

  c. where practicable, restoring water quality to at least a state that can support such activities and ecosystems and natural habitats;

- Policy 23 Discharge of contaminants

  1. In managing discharges to water in the coastal environment, have particular regard to:

  a. the sensitivity of the receiving environment;

  b. the nature of the contaminants to be discharged, the particular concentration of contaminants needed to achieve the required water quality in the receiving environment, and the risks if that concentration of contaminants is exceeded; and

  c. the capacity of the receiving environment to assimilate the contaminants; and:

  d. avoid significant adverse effects on ecosystems and habitats after reasonable mixing;

  e. use the smallest mixing zone necessary to achieve the required water quality in the receiving environment; and

  f. minimise adverse effects on the life-supporting capacity of water within a mixing zone.

  2. In managing discharge of human sewage, do not allow:

  a. discharge of human sewage directly to water in the coastal environment without treatment; and

  b. the discharge of treated human sewage to water in the coastal environment, unless:

  i. there has been adequate consideration of alternative methods, sites and routes for undertaking the discharge; and

  ii. informed by an understanding of tangata whenua values and the effects on them.

The NZCPS sets an expectation that water quality and ecosystems will be maintained or enhanced where degraded, that there is a consideration of alternatives and discharges are informed by an understanding of tangata whenua values and the effects on them.

As discussed above, the application is consistent with the expectation for progressively improving water quality in both freshwater and marine waters. While ecological effects associated with current discharges have been assessed as being minimal, a reduction in overflow frequency and volume will further reduce any such effects.

Alternative options such as storage have been assessed; but the fundamental cause of overflows is the excessive ingress of stormwater into the wastewater network and it is considered that substantially reducing this inflow is essential to a long term sustainable wastewater network. Reducing on-property flooding also results in other social and health benefits, including compliance with the Residential Tenancies (Health Homes Standards) Regulations 2019. Structural network options become more viable and can be considered in the future, once the majority of stormwater has been removed.

Engagement has been undertaken with tangata whenua to understand values and effects of them and on-going engagement and involvement is proposed (and incorporated into proposed conditions of consent).

Accordingly, it is concluded that the application is consistent with the provisions of the NZCPS.

8.7 National Policy Statement on Urban Development Capacity 2016

The NPSUDC recognises the national significance of:

a. urban environments and the need to enable such environments to develop and change; and

b. providing sufficient development capacity to meet the needs of people and communities and future generations in urban environments.

Gisborne is classified as a medium growth area under the NPSUDC. The application is for the discharge of wastewater overflows from both the existing public network and future networks to come under Council ownership and management. The targets for improvement outlined in Section 4 above recognise future growth, as does the infrastructure maintenance and upgrade programme outlined in the Long Term Plan and 30 Year Infrastructure Strategy.

Overall, the proposal is considered to be consistent with the NPSUDC as it will allow for the management and progressive reduction of overflow events, whilst taking into account future growth.

8.8 Marine and Coastal Area (Takutai Moana) Act 2011

The purpose of this Act is to—

(a) establish a durable scheme to ensure the protection of the legitimate interests of all New Zealanders in the marine and coastal area of New Zealand; and

(b) recognise the mana tuku iho exercised in the marine and coastal area by iwi, hapū, and whānau as tangata whenua; and

(c) provide for the exercise of customary interests in the common marine and coastal area; and

(d) acknowledge the Treaty of Waitangi (te Tiriti o Waitangi).

The Marine and Coastal Area (Takutai Moana) Act 2011 (MACA) applies if the application for resource consent is 'in relation to a part of the CMA' where no Customary Marine Title (CMT) orders or agreements apply, but applications have been made to the Court for CMT (and notice has been given), or an applicant has applied to enter into direct negotiations with the Crown.

There are nine parties/applicants who have applied for CMT within the wider Gisborne area, and those claims are currently working their way through the High Court process. As such, there are not currently any CMT orders or agreements in effect yet. Although direct overflows of wastewater to the CMA are not proposed and are highly unlikely, wastewater overflows may be transported (by rivers) to the CMA in some events – although any effects are temporary and will be progressively reduced.

As such, Council has conservatively (and out of an abundance of caution) sought the views of all parties/applicants within the discharge area and/or within the dispersion modelling. At the time of lodgement, no responses have been received. It is noted that a number of CMT applicants have also been party to the tangata whenua engagement that has been undertaken and reported in Section 7.

8.9 Ngā Rohe Moana o Ngā Hapū o Ngāti Porou Act 2019

The purpose of this Act is to contribute to the legal expression, protection, and recognition of the continued exercise of mana by ngā hapū o Ngāti Porou in relation to ngā rohe moana o ngā hapū o Ngāti Porou. To this end, this Act gives effect to the deed of agreement between ngā hapū o Ngāti Porou and the Crown. As noted above there are no direct overflows of wastewater to the CMA proposed by the application and these are highly unlikely to occur, but may be transported (by rivers) to the CMA in some events – although any effects are temporary and will be progressively reduced. As this legislation is relatively recent and refers to activities 'adjacent' to ngā rohe moana o ngā hapū o Ngāti Porou, the Applicant has again taken a conservative approach and anticipates that GDC regulatory may wish to provide a copy of the application to Ngāti Porou on direct notification (s16 of the Act).

8.10 Tairāwhiti Resource Management Plan

The TRMP covers all Gisborne District Council's resource management plans, including the regional policy statement (RPS), regional coastal plan, regional plan and district plan. A full assessment of the proposal against the relevant objectives and policies is set out in Appendix S. However, a broad overview of these provisions is provided below.

8.10.1 Part B – Regional Policy Statement

The RPS section of the TRMP sets the framework for the sustainable and integrated management of resources across the Tairāwhiti region. It identifies regionally significant issues and sets out objectives and policies that direct how natural and physical resources are to be managed. Being a high-level policy framework, the lower order regional and district plan provisions are required to give effect to the RPS.

The RPS includes several sections of specific relevance to the overflows consent, including provisions set out in:

- B1 – Tangata Whenua.

  In summary, provisions identify the need to take into account the principles of the Treaty of Waitangi, have regarding to kaitiakitanga (and accommodate the views of individual iwi and hapū), promote

(where practicable) the preservation and protection of sites of value to Māori, and recognise and provide for the relationship of Māori with their culture, traditions, ancestral lands, and other resources.

- B4 – Coastal Environment.

  In summary, provisions relate to water quality (that this is maintained or enhanced/improved where appropriate), avoiding or mitigating the effects of point-source discharges on receiving waters, recognising the mauri of water and protecting natural physical resources and biological communities in the coastal environment.

- B6 – Freshwater.

  In summary, provisions relate to the sustainable management of land and freshwater, that water quality is maintained or improved where degraded or does not meet the relevant objectives for the freshwater unit, scheduled waterbodies are protected or enhanced to provide for their values, the mauri of waterbodies is recognised and provided for and action is taken to restore the mauri of degraded waters, and mana whenua values are reflected in resource management processes.

It is considered that the application is consistent with the RPS for the reasons set out above, particularly in relation to the:

- Progressive reduction in overflow events and hence reduction of adverse effects and improvement in water quality;
- Improvement management and operational regime;
- Ongoing public health risk management through monitoring and signage; and
- Engagement with tangata whenua and the inclusion of conditions to better enable kaitiakitanga and involvement in the implementation of the consent.

8.10.2 Chapter C2 – Built Environment, Infrastructure and Energy

Chapter C2 sets out how Council will manage the infrastructure resources of the Gisborne district, including in relation to network utilities. The TRMP notes that *"network utility operations are essential to the day-to-day activities of the people in Gisborne district*", and that *"this chapter seeks to facilitate the efficient use and development of utility networks, while avoiding, remedying or mitigating any adverse effects arising from network utility activities"*.

The wastewater network is piece of essential regional infrastructure and an effective and efficient wastewater network is fundamental in an urban environment. Gisborne's wastewater network has expanded and been significantly improved over time to meet the needs of a growing city and changing community and cultural expectations. As with all wastewater (and drainage) networks, this continual process of expansion and improvement is on-going, in order to meet the foreseeable needs of future generations and to provide for the health and well-being of the community.

While the operation of the wastewater network can give rise to adverse effects, these are avoided, remedied or mitigated in accordance with the management methods, objectives and targets outlined in this application.

The application is considered to be consistent with the infrastructure provisions set out in this chapter.

8.10.3 Chapter C3 - Coastal Management

Chapter C3 provisions are regional plan provisions, regional coastal plan provisions and district plan provisions applying to the coastal environment. This chapter provides the policy framework for activities in the coastal environment (an area considered to encompass both the coastal marine area [CMA] and adjacent coastal land [and water]).

The provisions are grouped under:

1) broad issue areas, or
2) general activities classes.

Additional objectives and policies are also provided under the Coastal Environment Overlay section, which focus on the natural heritage values within the Coastal Environment.

The coastal management provisions include objectives and policies relating to discharges to the CMA and to the coastal environment. No direct discharges to the CMA are proposed, or likely to occur, but a coastal permit has been sought in the extremely unlikely event that a direct discharge to the CMA occurs.

The provisions seek that the physical and cultural quality of water and land in the coastal environment is maintained, or where practicable enhanced. The key objectives relating to water quality seek to progressively upgrade the quality of existing discharges to water of the coastal environment, and to avoid adverse effects on natural character and amenity from such discharges (where practicable), and where not practicable to remedy or mitigate such effects.

It is considered that the application is consistent with the coastal management provisions. A key aim of the consent is to progressive reduce wastewater overflows and hence adverse effects and improve water quality.

8.10.4 Chapter C6 – Freshwater

Chapter C6 provisions are regional plan provisions. Chapter C6 outlines the policies, rules and other methods for the management of freshwater resources within the region. Where the policies and rules refer to water quantity zones, minimum flows and allocation caps these are set within the individual catchment plans. Relevant policies include general water quality policies and policies for the management of point source discharges.

Section C6 includes a number of policies relating to point source discharges, and specific policies in relation to both DWOs and WWOs.

The key policy relating to WWOs is C6.2.1(9):

Discharges of untreated sewage from the reticulated infrastructure network shall be managed to:

a) Minimise the frequency of these discharges; and

b) Achieve performance of an overflow occurrence of no more than 50% probability in any given year;

c) Issue discharge permits for no longer than 5 years except where there is evidence from past performance to demonstrate that wastewater overflow events can reliably achieve the performance standard in clause b. above.

The performance targets for WWOs set out in this application are consistent with this policy.

In terms of DWOs the policy direction seeks no direct discharges to surface waterbodies, or to land where it can flow directly into a waterbody or to groundwater of untreated sewage / wastewater. Although the network is operated to avoid DWOs to the extent possible, in some circumstances discharges are unavoidable, can occur through 3rd party actions, and could occur anywhere throughout the network. As discussed above, the Gisborne wastewater system current performance is in line with national best practice.

However, to reduce and minimise the likelihood of dry weather overflows, Council has a range of management tools in place including proactive maintenance and education programmes, as well as defined performance targets to ensure that the wastewater system is appropriate managed, maintained and operated.

8.10.5 Chapter DP1 – Port Coastal Management Area

The provisions of DP1 are regional plan, regional coastal plan and district plan provisions. The exception is the rules, which are just regional coastal plan provisions applying only to the CMA.

This Management Area includes the existing Port Gisborne basin and a section of the Turanganui River. The primary purpose of the Port Coastal Management Area is to provide for activities related to the use of vessels and the transport of goods into and out of the Gisborne district, for which a location in the coastal environment is an operational necessity. The only provision relevant to this application is objective 4 which states *"Non port-related development provided for in the Port Coastal Management Areas in a way that does not compromise the operational requirements of the Port or those port-related industries and activities which have a direct relationship with marine activities and which benefit from a location in the Port".*

Overflow discharges to the Port Coastal Management Area will not compromise the operational requirements of the Port or directly associated activities and any discharges will be progressively reduced over time in line with the identified objectives and performance targets in section 4.

8.10.6 Chapter DC2 – General Coastal Management Area

The provisions of Chapter DC2 are both regional plan and regional coastal plan provisions and apply to the coastal environment. The General Management Area includes that portion of the coastal environment that is not within the Port or Significant Values Coastal Management Areas and encompasses the greater proportion of the Gisborne district coastal environment.

This Management Area seeks to ensure that use, development and protection of the coastal environment is appropriate by ensuring that adequate information regarding any proposed activity is supplied so that the effects of the activity on the coastal environment can be determined prior to any decision being made.

The key objective for this management area is the *'maintenance and enhancement of the quality and integrity of the coastal environment'*. The effects of overflow events are temporary, and the quality and integrity of the coastal environment will be maintained (and progressively enhanced) as a result of the

overflows consent which includes a programme of progressive improvement. On-going monitoring and performance reporting is proposed to ensure that these improvements are delivered.

8.10.7 Chapter DF1 – Freshwater Management Units: Waipaoa Catchment Plan

The provisions set out in Chapter DF1 are regional plan provisions.

The Waipaoa Catchment incorporates 12 major sub-catchment areas with a combined land area of 2,205km². The area is largely defined by the water catchment boundary of the Waipaoa River but also includes the separate catchment areas of the Waikanae Stream and Taruheru River. These two areas do not drain directly into the Waipaoa River but are both important components of the Poverty Bay Flats and to the Poverty Bay groundwater system and are included within this catchment plan.

Freshwater values and FMUs in the Waipaoa Catchment are closely related. The values identified through the catchment planning process have helped to inform the development of three Freshwater Management Units. They are:

a) Waipaoa Hill Country

b) Te Arai

c) Poverty Bay Flats

d) Gisborne Urban.

Of relevance to this application is the Gisborne Urban FMU.

Gisborne Urban Freshwater Management Unit

The two prominent freshwater bodies within this management unit are the Taruheru River and the Waikanae Stream. These waterways are identified as having important in-stream and indirect amenity values – including swimming, boating and fishing. The freshwater values being managed for in this FMU are set out in Table 19 and include:

Table 19: Gisborne Urban FMU - Values Being Managed For (Source: Figure DF1.21 of the TRMP)

Freshwater Values Being Managed For	
Prominent values identified	**Other values identified**
Human health (swimming)	Mahinga kai
Fishing	Natural form and character
Transport and turanga waka	Wai tapu
Ecosystem health	Mauri

The FMU includes a range of objectives (narrative and/or numeric) for the following attributes:

- Dissolved oxygen – INTERIM OBJECTIVE;
- Nitrate toxicity - INTERIM OBJECTIVE;

- Ammonia toxicity - INTERIM OBJECTIVE;
- Enterococci;
- Physical habitat;
- Clarity;
- Fish;
- Birds.

There are also water quality limits and targets in relation to temperature and suspended sediments.

As discussed in Appendix S (Statutory Assessment), overflow discharges are not likely to affect the ability to achieve the narrative/numeric objectives for most attributes. The exception to that are enterococci numeric objectives, where wastewater overflows may contribute significant levels of enterococci during overflow events (as discussed in Section 6.5).

However, it is noted that the median numeri objective of 280 CFU/100mL is currently met at most sites, other than the upper-most site on the Taruheru River (Tuckers - above the influence of wastewater overflows) and the Hirini site on the Kopuawhakapata Stream (where no overflow points are located). Reduction in the frequency and volume of overflows, as proposed in this application, will contribute to maintaining this target being met.

Infrequent wastewater overflows are more likely to affect the 95%ile objective of 500 CFU/100mL. However background water quality (in the absence of overflows) well exceeds the objective at all sites, particularly in upper catchment areas, indicating substantial catchment microbial sources. Reduction in the frequency and volume of overflows as proposed in this application, such that overflows do not occur in events less than the 50% AEP rainfall event, will contribute to the substantial reduction in catchment sources that is required to meet this numeric objective.

The analysis of monitoring data during past overflows events (Section 6.5) indicates that maximum ammonia concentrations in river water at all locations during all overflow events were substantially below the Gisborne Urban Freshwater Management Unit median guideline (1.3 g/m^3). The low concentrations measured during overflow events indicate that ammonia toxicity is not a concern in the monitored rivers. The contribution of ammonia from wastewater overflows is appears to be low and very unlikely to cause toxicity-related effects on aquatic organisms. As wastewater overflow frequency and volumes decrease in the future, any minimal effects will be further reduced.

In respect of nitrate toxicity, the numeric objective for the Gisborne Urban FMU (NOF Band A) is currently being met and the aim is to maintain current state[49]. In respect of the monitoring undertaken during overflow events, the highest nitrate-N concentrations were regularly recorded at the Taruheru Lytton site, in the outer urban area. Nitrate-N concentrations exceeded the ANZECC (2000) freshwater and SE Australian estuarine triggers for the protection of ecosystems at the three downstream sites in Taruheru River, NOF Bottom lines were not exceeded for any single sample during the monitoring periods examined. While the aim of the Gisborne Urban FMU to maintain its current state in respect of nitrate

[49] DF1.6 Summary of Waipaoa Catchment Plan Objectives, Limits and Targets. TRMP Part D, page 101

toxicity, any potential effects associated with wastewater overflows will further reduce as overflow frequency and volume decrease over time.

Wastewater overflows are highly unlikely to affect the ability to meet narrative standards for physical habitat, clarity, fish and birds.

Accordingly, it is considered that the application is consistent with the expectations of the Gisborne Urban FMU.

8.11 Assessment – RMA s104(1)c)

RMA s104 requires 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; and

(ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and

(b) any relevant provisions of—

(i) a national environmental standard;

(ii) other regulations;

(iii) a national policy statement;

(iv) a New Zealand coastal policy statement;

(v) a regional policy statement or proposed regional policy statement;

(vi) a plan or proposed plan; and

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

8.11.1 RMA s104(1)(a)

Section 104(1)(a) requires the consent authority to have regard to 'any actual and potential effects on the environment of allowing the activity'.

A range of technical studies and assessments have been undertaken to understand the effects of wastewater overflows, both at the current time and in the future following the implementation of the DrainWise programme. In respect of the cultural effects of wastewater overflows, these have been assessed using the 'mauri compass', which has been developed for the region, combined with engagement with tangata whenua.

In summary, as assessed in Section 6 above, actual and potential effects as a result of overflows include effects on:

- Water quality;

- Ecology;
- Public health risk;
- Emerging organic contaminants;
- Natural character;
- Cultural values; and
- Public amenity.

Overall, the effects are considered acceptable. While current discharges may give rise to some adverse effects, particularly in relation to microbial contaminants and pathogens, overflows will be subject to a range of actions and measures that seek to progressively reduce overflow frequency, volume and risk and hence adverse effects, consistent with the relevant statutory instruments.

8.11.2 RMA s104(1)(ab)

In terms of s104(1)(ab) it is considered that the discharges are not of a nature that would require specific offsetting or environmental compensation measures to ensure positive effects on the environment. Ecological and water quality effects are generally temporary and no more than minor. The operation of the wastewater network itself is of significant positive benefit to the community and environment.

It is considered that investment and effort is best directed to measures, such as the DrainWise programme that seeks to reduce stormwater that gives rise to wet weather overflows and improved maintenance and public education, to reduce the occurrence of wastewater overflows.

8.11.3 RMA s104(1)(b)

In terms of s104(1)(b) there are no relevant national environmental standards or other regulations. Assessment against the most relevant objectives and policies of the NZCPS and NPSFM is provided in Appendix S. Assessment against the relevant objectives and policies of the TRMP, including the RPS, is also provided in Appendix S.

8.11.4 RMA s104(c)

In accordance with Section 104(1)(c), the consent authority may consider any other relevant matters in order to make a determination on the application. Other matters that are considered to be relevant are summarised below.

Statutory Acknowledgements

A Statutory Acknowledgement is a formal acknowledgement by the Crown of the mana of tangata whenua over a specified area. It recognises the particular cultural, spiritual, historical and traditional association of an iwi with the site, which is identified as a statutory area.

Statements of Statutory Acknowledgements are set out in Treaty of Waitangi claim settlement legislation. The text for each statutory acknowledgement includes:

- identification and description of the statutory area;
- a statement of association detailing the relationship between the relevant iwi; and

- details of the statutory area.

These statements of association have been recognised and taken into account in developing this application.

Statutory areas only relate to Crown-owned land and include areas of land, geographic features, lakes, rivers, wetlands, and coastal marine areas. With respect to bodies of water such as lakes, rivers and wetlands, the statutory acknowledgement excludes any part of the bed not owned or controlled by the Crown.

Statutory Acknowledgements are currently in place for the following water bodies (affected by overflows):

Ngāti Porou statutory areas are:

- Tūranganui River and its tributaries (to the extent that this area is within the area of interest), upstream of the coastal marine area.
- Waimata River (as a tributary of the Tūranganui River) to the extent that this area is within the area of interest), upstream of the coastal marine area.

Rongowhakaata statutory areas are:

- Tūranganui River within Rongowhakaata area of interest.
- Taruheru River within Rongowhakaata area of interest.
- Waimata River within Rongowhakaata area of interest.
- Waikanae Stream within Rongowhakaata area of interest.
- Rongowhakaata coastal marine area within Rongowhakaata area of interest.

Ngai Tāmanuhiri statutory areas are:

- Ngai Tāmanuhiri coastal marine area; and
- Part Waipaoa River (including Karaua Stream).

Iwi Management Plans

Iwi or hapū Management Plans are a policy statement that describe resource management issues important to tāngata whenua. The plans provide iwi resource management strategies for sustainable development of natural and physical resources. They may also have information relating to specific cultural values, historical accounts, descriptions of areas of interest, hapū and iwi boundaries (rohe) and consultation and engagement protocols for resource consent and plan changes. The plans are not a substitute for consultation or partnership.

The Council has formally received Iwi Management Plans (IMP) from:

- Ngā Ariki Kaiputahi; and
- Te Aitanga-a-Māhaki.

The Ngā Ariki Kaiputahi includes a summary of the history of Ngā Ariki Kaiputahi, as well as their vision and kaitiakitanga objectives. Key concerns for Ngā Ariki Kaiputahi, as listed in the IMP include tapu, mana and mauri of ecosystem. They consider *"Best practice are a blend of important principles and values such*

as Tapu, Mana, Mauri, Rahui, Karakia and Tikanga that contribute to sustaining the balance of the natural world and the Nga Ariki Kaiputahi way of life." The IMP seeks to be a starting point for advancing participation in the management of environmental and physical resources, and inclusion in decision making processes.

The Te Aitanga-a-Māhaki Iwi Environmental Inventory provides an assessment of the state of the rohe and environmental transformations that have occurred, including making specific reference to the impact if sewage disposal practices on traditional resources. Further, the inventory identifies the following significant water issues for iwi:

1) Kaitiakitanga – limited input into plans and implementation.
2) Cultural landscapes – restoring mauri, protecting waahi tapu.
3) Wastewater discharge – untreated discharge to the moana.
4) Coastal development – limited tangata whenua input.

This application sets out a programme for continual improvement in relation to matters 2) and 3).

These plans are acknowledged and have been taken into account in the development of this consent application, including through the proposed consent conditions relating to the ability for tangata whenua to advise on, and input into, the implementation of the consent.

8.12 Assessment – RMA s104D

To be able to grant consent to a non-complying activity, a consenting authority must be satisfied that either the adverse effects of the activity on the environment will be minor (s104D(1)(a)), or the proposed activity will not be contrary to the objectives and policies of a proposed plan and/or plan (s104D(1)(b)).

This consideration is commonly known as the 'threshold test' or the 'gateway test'. If either of the limbs of the test can be passed, then the application is eligible for approval, but the proposed activity must still be considered under Section 104. There is no primacy given to either of the two limbs, so if one limb can be passed then the 'test' can be considered to be passed.

The current adverse effects of wet and dry weather overflows on the environment have the potential to be more than minor, particularly in relation to cultural effects. However, adverse effects are episodic and temporary. Importantly, the aim of the consent is to substantially reduce WWOs and manage DWOs to a practicable minimum – noting that Council's performance is already (prior to these improvements) on par with better performing councils nationally. Accordingly, any existing adverse effects will be substantially reduced.

Notwithstanding this, an assessment of the proposal against the relevant objectives and policies of the TRMP, in accordance with s104D(1)(b), is provided below (and a full statutory assessment is provided in Appendix S).

- The TRMP includes a range of water quality provisions which seek that coastal water quality is maintained or enhanced and that improvements to water quality are made where appropriate; for example Objectives B4.3.1(3), B4.7.1(1), C3.10.2(1), Policies C3.10.13(2) and (7a). Similarly, under the freshwater provisions of the TRMP, the plan seeks that the quality of freshwater is maintained and is improved where it is degraded or does not meet the relevant objectives for the freshwater unit

(Objective B6.2.1(2), Policies B6.2.6(2) and (5)). The TRMP also provides a number of general water quality policies in C6.2.1 and policies relating to point source discharges at C6.2.2.

The application is consistent with the overall objectives because it seeks to progressively reduce wastewater overflows and progressively reduce the adverse effects of wastewater discharges, and hence improve water quality over time. This improvement will be achieved through a range of mechanisms, including reducing the frequency and volume of overflow events, as well as through implementing a hierarchy of overflow points (wet weather) and improved overflow management protocols to better manage overflows.

While the wastewater network overflow performance is on-par with the better performing Council networks across New Zealand, network design, management and maintenance and overflow response is being continually improved and refined to reduce overflows and effects on water quality.

The enterococci (95%ile) numeric attribute for the Gisborne Urban FMU is not currently being met. While wastewater overflows may contribute to this degraded state, it is primarily a result of 'background' (ie non-overflow discharges). Nothwithstanding this, a substantial reduction in overflow frequency and discharge volume is proposed, consistent the relevant policy direction seeking improvement. While overflows are unlikely to influence the achievement of other attributes, implementation of the DrainWise Programme, together with ongoing refinements of the network operations and management, will further reduce any contribution from wastewater overflows. .An assessment of the cultural impacts of the proposal and recognition of the mauri of waterways has also been recognised and provided for through the process and is discussed in more detail below, along with mana whenua values, matauranga and tikanga.

DWOs are unpredictable and could occur anywhere throughout the network as a result of unexpected problems in the network. The GWS is land based and covers much of the Gisborne urban area. However, DWOs can from time to time result in discharges over land to surface waters. DWOs are responded to as quickly as possible, to reduce effects and potential discharges to water. Council's network meets best practice design and Council's DWO performance is on-par with the better performing Council networks across New Zealand.

To further reduce the likelihood of DWOs, Council has increased its proactive maintenance of critical wastewater assets to minimise the risk of build-up of material in the network leading to dry weather overflows. Council also undertakes regular education campaigns to reduce foreign materials being disposed of into the network. As demonstrated in Section 7, these have generated significant interest and views. Accordingly, DWOs will be managed through relevant consent conditions.

Minimising wastewater overflow discharges, both wet and dry, is fundamental to the consent application. In terms of wet weather overflow (WWO) performance of no more than 50% probability in any given year within ten years is a key aim of the consent. Substantial studies have been undertaken to understand the causes of these overflows and priorities for their resolution to provide confidence that the target can be met. As indicated above, DWOs are avoided (to the extent practicable) and otherwise managed and responded to as detailed in the application. Given the causes of DWOs primarily occur through 3rd party actions, public education is an essential component of reducing DWOs.

- The TRMP includes a range of provisions specific to recognising and providing for tangata whenua values (set in in Chapter B1 – Tangata Whenua, as well as integrated within coastal and freshwater provisions in Chapters B4 – Coastal Environment, B6 – Freshwater, C3 – Coastal Management and C6 – Freshwater). The TRMP also seeks that the mauri of water is recognised and that action is taken to restore the mauri of degraded waters (Objectives B4.7.1(2) and B6.2.1(10), Policies C3.6.3(5) and C6.2.2(2c)).

  An assessment of the cultural impacts of wastewater overflows has been undertaken by tangata whenua and a summary of this process, and its outcomes, is included in Section 7 of the application. Conditions of consent have been proposed that enable and provide for tangata whenua to advise on, and input into, the implementation of the consent. The mauri of the receiving environments is recognised within this application and a range of mechanisms are proposed to better monitor values from a cultural perspective and to progressively work with tangata whenua to restore the mauri of degraded waters. This is supported by tanagta whenua's application of the 'Mauri Compass' to both the current and future situation.

- Objectives B4.8.1(1), C3.10.2, C3.14.1(1) and Policy C3.2.3(8) seek to avoid, mitigate or remedy the adverse effects on receiving waters and preserve natural character.

  The consent includes a range of methods and management approaches to avoid, mitigate or remedy the adverse effects on receiving waters. The intent of the consent is to reduce and mitigate adverse effects, particularly public health risk, through the implementation of the DrainWise Programme to reduce overflows; appropriate operation, management and maintenance of the network; and robust overflow response and monitoring processes to manage potential health risk. In addition, while existing effects on natural character and amenity of the environment are temporary and primarily occur during heavy rainfall events, the proposed management regime will further reduce any minimal existing adverse effects on the natural character of the rivers and the Wherowhero/Waipaoa Estuary.

- Objectives C2.1.3(1) and (2) and Policies C2.1.4.1(1) – (3) seek to provide for the efficient operation of essential network infrastructure in a manner that avoids, as far as practicable, remedies or mitigates any adverse effects on the environment..

  The wastewater network is piece of essential regional infrastructure and an effective and efficient wastewater network is fundamental in an urban environment. Gisborne's wastewater network has expanded and been significantly improved over time to meet the needs of a growing city and changing community and cultural expectations. As with all wastewater (and drainage) networks, this continual process of expansion and improvement is on-going, in order to meet the foreseeable needs of future generations and to provide for the health and well-being of the community.

  This application provides for the ongoing operation of the network, subject to a range of management and maintenance requirements and a programme of progressive improvement which collectively ensure adverse effects are avoided, remedied or mitigated. This is considered to be consistent with the infrastructure provisions set out in Chapter C2 of the TRMP, in particular. Further, infrastructure policies recognise the need to provide for the ongoing operation of network utilities and for their future development and operation, as well as the benefits of efficient network infrastructure, as long

as infrastructure is managed in a manner that avoids, as far as practicable, remedies or mitigates any adverse effects on the environment.

Overall, the proposal is considered consistent with this policy direction.

A more detailed assessment against each relevant objective and policy in the TRMP is provided at Appendix S. Overall it is considered that the application is not contrary to, and is largely consistent with and gives effect to, the objectives and policies of the TRMP.

As such the application can be considered under Section 104 and a determination made on the application as provided by Section 104B.

8.13 RMA s105

Section 105 of the Act lists specific matters for a discharge permit or coastal permit to which a consent authority must have regard to. These include the three matters below.

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

This is described in section 6 – Assessment of Effects. This describes the nature of the wastewater discharge and adverse effects on freshwater, estuarine and coastal waters and associated ecosystems. This has informed the wastewater overflow management response (particularly for wet weather overflows, through limiting overflow points to the larger rivers with greater assimilative capacity).

b) The applicant's reasons for the proposed choice

The wastewater overflow management objectives and associated overflow performance measures (as set out in section 4) represent what is considered the efficient and effective way of reducing wet and dry weather overflows and mitigating their effects when such events occur.

c) Any possible alternative methods of discharge, including discharge into any other receiving environment

As dry weather overflows primarily occur as a result of 3rd party actions (blockages etc) there are few alternative methods available to Council to the current proposal which provides for on-going maintenance, surveillance, public education and response. Council has placed significant emphasis on the aspects within its direct control, including improving maintenance and ensuring appropriate and timely responses to minimise the likelihood of DWO discharges reaching water.

For wet weather overflows, a number of alternatives are available and have been considered. These are discussed in Section 3.5. While alternative options have been considered, Council is of the firm view that the most effective and enduring method of reducing overflows is to substantially reduce the volume of stormwater entering the wastewater network. Alternative options, such as additional storage, can then be considered once substantial volumes of stormwater has been removed.

8.14 RMA s107

Section 107 of the Act applies to the application as it imposes restrictions on the granting of certain discharge permits. A discharge permit shall not be granted if, after reasonable mixing, the discharge of a

contaminant or water into water is likely to give rise to all or any of the following effects in the receiving waters:

- the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
- any conspicuous change in the colour or visual clarity;
- any emission of objectionable odour;
- the rendering of freshwater unsuitable for consumption;
- any significant adverse effects on aquatic life.

Despite the above, a consent authority may grant a discharge permit if it is satisfied that the discharge is consistent with the purpose of the Act, and:

- that exceptional circumstances justify the granting of the permit; or
- that the discharge is of a temporary nature; or
- that the discharge is associated with necessary maintenance work.

In terms of dry weather overflows, these are unpredictable, but the effects are mitigated as much as possible through education, proactive maintenance, timely responses and clean-ups. In rare instances dry weather overflows may occur to small streams and not be picked up (due to cracked pipes etc), where there could be effects on aquatic life. However, in general these overflows are of a temporary nature and generally have temporary effects in terms of any conspicuous change in the colour or visual clarity (if there is a discharge to a waterbody) and emission of objectionable odour.

In terms of wet weather overflows, generally these will not produce conspicuous oil or grease films, scums or foams. However, some floatable or suspended materials may be present in the discharge. As these occur in high rainfall events, when these discharges occur, there would generally be no conspicuous change in the colour or visual clarity, due to the contribution of other discharges (such as sediment run-off) from upstream catchments. As these discharges occur in saline environments at the bottom of catchments, the water would normally be unsuitable for consumption, irrespective of the wastewater discharge. Further, as discussed in section 6, effects of wet weather overflows on aquatic life are considered to be minimal.

Accordingly, it is considered that consent can be granted as the discharges are of a temporary nature. Additionally, there are exception circumstances that justify the granting of the permit. These are:

- The drainage network is essential infrastructure and its on-going operation is essential to the health and safety of the Gisborne community;
- A programme is in place that seeks to achieve the wet-weather overflow performance target of an overflow occurrence of no more than 50% probability in any given year, consistent with Policy C6.2.2(9) of the TRMP;
- Council's current overflow performance is at a level that is on par with the best performing councils nationwide, and further management improvements and wet weather overflow reductions are proposed.

8.15 RMA s123 – Duration of Consent

Under the freshwater policies for point source discharges, policy C6.2.2(9) states:

9. Discharges of untreated sewage from the reticulated infrastructure network shall be managed to:

a) Minimise the frequency of these discharges; and

b) Achieve performance of an overflow occurrence of no more than 50% probability in any given year;

c) Issue discharge permits for no longer than 5 years except where there is evidence from past performance to demonstrate that wastewater overflow events can reliably achieve the performance standard in clause b. above.

This consent seeks a duration of 20 years.

It is considered that this term is appropriate because:

- The causes of wet weather overflows are well understood as a result of significant investigation, study and field experience; such that there is confidence that the identified level of performance in Clause b can be achieved.
- A substantial programme of work is being implemented to progressively reduce stormwater inflow to the network and, as a consequence, wet weather overflows. This programme is well underway.
- As overflows are the cumulative result of numerous sources of stormwater inflow, some time is required to implement sufficient remedial actions (primarily on private property) for an observable reduction in overflows to be achieved.
- Potential adverse effects on the environment can be appropriately managed through consent conditions which include a highly transparent reporting programme and review conditions.
- A review condition in accordance with section 128 of the RMA is proposed, providing for the ability to review the conditions of consent should circumstances change.
- Requiring a short-term consent is a 'blunt instrument' by which to manage adverse effects and does not provide sufficient certainty for public infrastructure management and investment. It will direct expenditure and resource away from resolving problems 'on the ground' to further assessment and consenting costs – and hence risks being counter-productive to achieve the desired level of performance.

Accordingly, it is concluded that the proposed programme can reliably achieve the desired level of performance as specified in Policy C6.2.2(9), albeit over a period of more than five years.

9 PROPOSED CONDITIONS OF CONSENT

9.1 Introduction

Draft conditions of consent are proposed to:

- Provide for the appropriate management of the GWS;
- Ensure overflow performance is progressively improved to meet the performance objectives and targets in Section 4;
- Give effect to the outcomes from engagement with tangata whenua;
- Ensure transparent reporting of performance.

These conditions are provided as a 'starting point' and it is expected that they will be refined during the consent process.

9.2 Proposed Conditions

Scope

1) This consent authorises the discharge of wastewater via overflows from the Gisborne City Wastewater System (**GWS**) within the Gisborne Reticulated Services Area subject to the conditions below. This includes:
   a) Discharges from formal and informal overflow points within the system during wet weather events;
   b) Discharges from formal and informal overflow points within the system, and from pipes as a result of dry weather overflows.

Advice Note:

The following activities are not authorised under this consent:

a. The discharge of Wastewater from the Gisborne Wastewater Treatment Plant which is authorised by separate consents.

b. Discharges from other wastewater networks within the wider Gisborne District (for example, Te Karaka).

Expiry

2) This consent shall expire on XX/XX/XXXX, 20 years from the date consent is granted.

Documentation

3) This consent shall be exercised generally in accordance with the information and processes included in this consent application and appendices, updated as required by these conditions, including:

a) Capital and operational works required to achieve the outcomes sought in Table 13 and Table 14, in accordance with the LTP 2018 to 2028 and subsequent versions;

b) Wastewater Overflow Location and Operation Manual;

c) Scour Overflow Events Sampling Protocol;

d) Infrastructure Investment on Private Property Strategy (IIOPPS)

Operation and Maintenance

4) The Consent Holder shall ensure that the following Operational Management Plans/Protocols shall be in place and adhered to at all times:

a) Operations and Maintenance Plan (including a Maintenance Programme);

b) Wastewater Overflow Location and Operation Manual (including scour valve opening procedures and notification processes);

c) Overflow Response and Contingency Plan (including response procedures, notification, public health risk management such as signage and notification via Council's website or Facebook and to Tangata Whenua so they can implement inter alia rahui).

(together the **"Operational Management Plans/ Protocols")**

5) Where these Operational Management Plans/Protocols do not currently exist as a standalone document, or require updating as a result of the resource consent process, the Consent Holder shall ensure the Management Plans/Protocols are prepared within 6 months of the conditions of this consent being concluded as final (following the disposition of any appeals), and submitted to Gisborne District Council.

6) The Consent Holder may submit the Operational Management Plans/Protocols either separately, or together in the form of a single document.

Monitoring

7) The Consent Holder shall ensure that the following Monitoring Plans shall be in place and adhered to at all times:

a) Wastewater Overflow Monitoring Plan (identifying monitoring required following an overflow event to water);

b) Tangata Whenua Cultural Monitoring Plan.

(together the "**Monitoring Plans"**)

8) Where these Monitoring Plans do not currently exist as a standalone document, or require updating as a result of the resource consent process, the Consent Holder shall ensure the Monitoring Plans are prepared within 6 months of the conditions of this consent being concluded as final (following the disposition of any appeals), and submitted to Gisborne District Council for approval.

9) The Consent Holder may submit the Monitoring Plans either separately, or together in the form of a single document.

10) The Consent Holder shall undertake all monitoring in accordance with, and shall comply with, the approved Monitoring Plans.

Progressive Overflow Reduction

11) The Consent Holder shall implement a programme (the DrainWise Programme) to achieve the wastewater levels of service in Table 13 and Table 14.

12) The Consent Holder shall manage the GWS and stormwater system to achieve performance a wet weather overflow occurrence of no more than 50% probability in any given year by [insert date - being year 10 of this consent being concluded as final (following the disposition of any appeals)].

13) The Consent Holder shall manage the GWS so that Dry Weather Overflows only occur as a result of network failures including, but not limited to, breakages, blockages, third party damage and mechanical or power failure at pump stations or storage facilities. At no time shall components of the network have insufficient capacity to cater for peak dry weather flow from the contributing catchment area.

Tangata Whenua Reference Group (TWRG)

14) By [date – being 2 months of the conditions of these consents being concluded as final (following the disposition of any appeals)], the Consent Holder shall provide an offer to tangata whenua groups or entities affected by the wastewater overflows, to establish and maintain a TWRG for the term of this consent with the intent of establishing the TWRG within six months of the commencement of the consent.

15) On acceptance of the offer a Memorandum of Understanding (MoU) shall be entered into by the Consent Holder and the members of the TWRG that includes as a minimum:

a) The conditions of these consents;

b) The composition of the TWRG and the process by which membership may be amended;

c) A terms of reference;

d) The rates of remuneration for members of the TWRG;

e) Period of review of the MoU and rates of remuneration.

16) The purpose/role of the TWRG shall be to:

a) Recognise the importance of the wai and to recognise the kaitiakitanga of Māori who have a kaitiaki relationship with the wai;

b) Provide a forum for discussing the cultural aspects and effects of the operation of the consent;

c) Advise on management protocols related to dry and wet weather overflows to integrate tikanga aspects such as the placement of rahuis and other processes

d) Provide input in setting priorities for works and associated programmes to mitigate cultural effects;

e) Assist in identifying any research or investigations necessary to help improve the management of the stormwater and wastewater networks to mitigate cultural effects; and

f) Advise on wastewater monitoring related to wastewater overflows to include cultural elements, and make the monitoring relevant to kaihoe waka, shellfish gathering, and other Māori resource-use practices, including inputing into, reviewing and providing feedback on the Tangata Whenua Cultural Monitoring Plan (See Condition 7) to report on the performance of the wastewater network from a cultural perspective.

17) The Consent Holder shall:

a) Facilitate and fund the administration of each formal meeting of the TWRG. The first TWRG meeting shall be held as soon as practicable after the establishment of the TWRG. The TWRG shall then meet at least twice yearly, including after the Annual Report is prepared under Condition 18 or the Five Year Report prepared under Condition 20 thereafter for the term of this consent.

b) Take minutes of the TWRG, which shall be forwarded to Gisborne District Council Regulatory within four weeks of each meeting being held.

Annual Reporting

18) The Consent Holder shall report on the performance of the wastewater network and progress towards achieving the wastewater levels of service on an annual basis (Financial Year) by September of each calendar year. Reports shall be provided to:

a) Gisborne District Council Regulatory;

b) Gisborne District Council Wastewater Management Committee;

c) The Tangata Whenua Reference Group;

d) Gisborne District Council's website in a location that is accessible to all members of the public.

19) The reporting shall include:

a) The matters identified in Table 14;

b) The results of any monitoring undertaken in accordance with Condition 7a and b.

It is noted that Council undertakes bathing beach monitoring and State of the Environment monitoring. It is envisaged that this will be used as part of the on-going monitoring programme required under this consent.

Five Year Reporting

20) The Consent Holder shall report on the performance of the wastewater network and progress towards achieving the wastewater levels of service on a five yearly basis. This report shall assess:

a) The consolidated inspections and improvements undertaken over the preceding five year period;

b) Trends in overflow occurrence, including consideration of rainfall events, and an assessment of the basis for any trends;

c) Trends in water quality monitoring – both state of the environment and overflow event related;

d) The outcomes of monitoring (including cultural) that has been undertaken;

e) The implications of this monitoring on future management approaches.

f) Any updated wastewater dispersion modelling.

Review

21) The conditions of this consent may be reviewed by the Council pursuant to section 128 of the RMA (with the costs of the review process being borne by the Consent Holder) by the giving of notice, pursuant to section 129 of the RMA:

a) Within three years of the consent being granted and thereafter at three yearly intervals;

b) At any time:

i. to address any unanticipated adverse effects that arise from the exercise of the consent; or

ii. where a regional plan has been made operative which sets rules relating to minimum standards or water quality and in Gisborne District Council's (as regional authority) opinion it is appropriate to review the conditions of consent in order to enable the standards set by the rule to be met; or

iii. when a relevant national environmental standards or national planning standards have been made.

22) The review under Condition 21) may only be for one or more of the following purposes:

a) To address any material adverse effects on the environment, that in the opinion of the Council, is not contemplated by this consent which may arise from the exercise of the consent, or upon which the exercise of the consent may have an influence, including, but not limited to:

i. modifying existing conditions, to require the Consent Holder to identify the character or nature of any discharges authorised by this Consent and to report the results of any monitoring or investigations to the Manager;

ii. consideration of the conditions of this consent that may relate to the matters contained in s.108(4) of the RMA or any Act in substitution thereof;

iii. inserting conditions, or modifying existing conditions, related to water quality standards.

b) To insert conditions, or modify existing conditions to the extent necessary to give effect to any National Policy Statement or National Environmental Standard

Administrative Charges

23) The consent holder shall pay the Council's full and reasonable costs in carrying out its functions in terms of certification and monitoring under this consent.

10 SUMMARY AND CONCLUSION

Gisborne District Council owns and operates an essential wastewater system (the GWS) that services the city of Gisborne, collecting wastewater from houses, businesses and industry and transports this via a series of pipes and pumping stations to a WWTP. The treated discharge from the WWTP is currently directed to a marine outfall, located some 1.8 km offshore in Tūranganui-a-Kiwa (Poverty Bay) which is authorised under its own consent.

50% of the reticulated wastewater network is located on private property and is owned by the property owner, and the other 50% is publicly owned and managed by Council. These two components operate as one network, with both public and private responsibilities, which presents specific management challenges.

The GWS is sized and operated in accordance with current engineering practice, with the main elements of the system being sized to cater for up to four times ADWF in the main interceptors and up to six times ADWF in upper catchments. Overall, the GWS is assessed by a network model to adequately convey six times ADWF. This design capacity allows for daily peak usage when demand is the highest and a portion allows for the inevitable ingress of stormwater into the wastewater network during wet weather that occurs in any wastewater network through inflow and infiltration.

WWOs occur as a result of excessive rainwater/ stormwater entering the wastewater network through inflow and infiltration. This occurs primarily on private property, as a result of incorrect drainage, flood water overtopping gully traps, and infiltration into pipes through cracks and joints. Where the combined volume of stormwater and the wastewater flow carried in the network exceeds the capacity of the system, a combination of stormwater and wastewater will be discharged – either through formal (designed) overflow points or otherwise via informal overflow points such as manholes and private gully traps at low points in the system. When the wastewater system is becoming overloaded with stormwater, Council proactively opens overflow valves that discharge overflows to Gisborne's rivers in preference to allowing wastewater to back up and overflow via gully traps and manholes including on private property.

Over the past 14 years WWOs have occurred, on average, 2.5 times per year. While these overflows occur in heavy rain, an assessment of rainfall intensity and overflow events has not deduced any clear relationship, with both short and long duration high intensity rainfall appearing to lead to overflows.

DWOs occur as a result of unexpected problems in the wastewater network resulting in wastewater being discharged from manholes or gully traps and, in extreme cases, pump stations. In Gisborne, DWOs generally occur where there is a blockage in the network, mostly associated with a third party putting a foreign object in the wastewater system or fat build-up, and also occur in rare instances as a result of an extended power failure to a pumping station or a break in the network. DWOs are typically small, short duration events – typically between 100 and 2,000 litres and a duration of less than two hours – and most do not reach a waterway.

A resource consent for these existing overflow discharges is required under the TRMP. Consent is sought as a non-complying activity as this is the most stringent activity status that applies – to DWOs. WWOs would otherwise be a restricted discretional activity under the TRMP. Out of an abundance of caution, a

coastal permit is also sought for discharges to the CMA; however, there are no direct discharges and none are proposed.

Consent is being sought on the basis of a substantial programme of improvement, called the DrainWise programme, together with improved overflow management (including limiting overflows to identified points), appropriate overflow response/monitoring, proactive network maintenance and operational and other network management improvements. This programme of improvements continues on from the substantial work that Council has already undertaken to better manage and reduce overflows, which has seen a significant reduction in the use of overflow locations and in the volume discharged in a WWO event.

The aim of these measures and improvements is to ensure that the frequency and volume of WWOs are progressively reduced (to a target of no overflows in a 50% AEP rain event) and that all overflows are minimised to the extent practicable in line with best practice. In this regard, it is noted that Council's existing network overflow performance, both wet and dry weather, is at the upper (better) end of wastewater network overflow performance nationwide and the measures and improvements will further reduce WWOs in particular.

Council's DrainWise Programme is central to achieving improved overflow performance, and is a multi-faceted programme that includes:

- Strategic direction on Council's wastewater and stormwater network upgrades, renewals, extensions, maintenance, monitoring, and other operational activities;
- The systematic inspection of all private property connections and identification of drainage issues;
- Council fixing minor private drainage issues where possible;
- Requiring illegal drainage to be addressed as a priority;
- Identifying longer term network improvements (for example extending the public stormwater network to better drain private properties);
- Working with landowners and residents to programme works to be done in a way that can be affordable; and
- Providing material to help people understand the role and function of the wastewater and stormwater network, what not to put down it, and how to correct drainage.
- Work collaboratively with Central Government to implement the Health Homes Guarantee Act

Wastewater overflows can give rise to a range of adverse effects, including on the following:

- Social and cultural values. As indicated in the results of engagement with tangata whenua, allowing wastewater overflows is unacceptable to Tangata Whenua - it encroaches upon core fundamental principles of customary social and spiritual rights and practises, and it affects them deeply spiritually, socially, and culturally. Wider community and targeted stakeholder feedback also highlights the effects overflows have on peoples ability to interact with freshwater and coastal environments.
- Public health. Overflows can lead to public health risks through contact recreation and shellfish harvesting and consumption in affected waters. Risks associated with these adverse effects are currently mitigated through appropriate warning and signage in respect of overflow events.

- y. The ecological effects of past overflows of aquatic ecology have been assessed as being low and overflows are unlikely to give rise to any toxic effects.
- Water quality. Wastewater overflows, particularly WWOs, can contribute to degraded water quality – particularly in the Taruheru River. The primary parameters of concern are microbial indicator contaminants, notably enterococci, and to a lesser extent nutrients. As WWOs occur in heavy rain, and in the lower urban reaches of the rivers, overflows add to existing contaminant loads carried in runoff from up-catchment.

All of these adverse effects will be substantially reduced, but not eliminated, as the frequency, duration and volume of overflows is reduced through the DrainWise programme and other network management improvements are implemented. In addition, potential health risk will continue to be managed through public notification and signage.

The TRMP provides the primary statutory framework under which the consent is assessed. The TRMP includes a range of water quality provisions which generally seek that coastal water quality is maintained or enhanced and that improvements to water quality are made where appropriate. As discussed above, consent is being sought on the basis of a programme to substantially reduce stormwater inflow and, as a result, the frequency and duration of WWOs. This is entirely consistent with the aim of improving the water quality in both fresh and marine waters.

The TRMP also seeks to manage water quality in the Gisborne Urban FMU to meet a range of narrative and numeric water quality objectives. While overflows may contribute to degraded water quality, they are unlikely affect the ability to achieve the narrative/numeric objectives for most attributes that have been established. The most relevant are the enterococci numeric objectives, where wastewater overflows may contribute significant levels of enterococci during overflow events. However, it is noted that the median numeric objective of 280 CFU/100mL is currently met at most sites, other than the upper-most site on the Taruheru River (Tuckers - above the influence of wastewater overflows) and the Hirini site on the Kopuawhakapata Stream (where there are now no overflow points located). Infrequent wastewater overflows may potentially affect the 95%ile objective of 500 CFU/100mL. However, background water quality (in the absence of overflows) well exceeds the objective at all sites, particularly in upper catchment areas, indicating substantial catchment microbial sources. Reduction in the frequency, duration and volume of overflows as proposed in this application, such that overflows do not occur in events less than the 50% AEP rainfall event, will contribute to the substantial reduction in catchment sources that is required to meet these numeric objectives.

Accordingly, it is considered that the application is not contrary to, and is largely consistent with and gives effect to, the objectives and policies of the TRMP.

It is also considered that the application is consistent with Part 2 of the RMA. The wastewater network is essential regional infrastructure – an effective and efficient wastewater network is fundamental and core infrastructure supporting an urban environment by transporting wastewater away from homes, commercial activities and industries and providing for its treatment and disposal. Gisborne's wastewater network has expanded and been significantly improved over time to meet the needs of a growing city and changing community and cultural expectations. As with all wastewater (and drainage) networks, this continual process of expansion and improvement is on-going, in order to meet the foreseeable needs of future generations and to provide for the health and well-being of the community.

The proposed approach to wastewater overflow management, and proposed performance objectives and targets and conditions of consent which set out the management framework for overflow events, seek to protect natural and physical resources and the health and safety of communities. Finally, through these proposed consent conditions, the potential adverse effects caused by the overflow events on the environment and to human health are avoided (where possible), remedied or mitigated.

Accordingly, it is considered that the consent can be granted, subject to the proposed conditions (or similar).