BEFORE THE INDEPENDENT HEARINGS PANELS APPOINTED TO HEAR AND MAKE RECOMMENDATIONS ON SUBMISSIONS AND FURTHER SUBMISSIONS ON PROPOSED PLAN CHANGE 1 TO THE NATURAL RESOURCES PLAN FOR THE WELLINGTON REGION

UNDER	the Resource Management Act 1991 (the Act)
AND	
IN THE MATTER	of Hearing of Submissions and Further Submissions on Proposed Plan Change 1 to the Natural Resources Plan for the Wellington Region under Schedule 1 of the Act

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STATEMENT OF EVIDENCE OF DR PETER STANLEY WILSON

ON BEHALF OF GREATER WELLINGTON REGIONAL COUNCIL

TECHNICAL EVIDENCE – COASTAL HUMAN CONTACT

HEARING STREAM 2 – OBJECTIVES

28 FEBRUARY 2025

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INTRODUCTION

1 My full name is Peter Stanley Wilson. I am a Principal Marine and Water Quality Scientist at SLR Consulting, where I have worked since February 2019. Prior to this role, I held the position of Coastal Water Quality Scientist at the Waikato Regional Council for four years. In these roles, my responsibilities have focused on marine science, research, and resource management with a focus on sediment and water quality.

2 I have prepared this statement of evidence on behalf of Greater Wellington Regional Council (**the Council**) in respect of technical matters arising from the submissions and further submissions Proposed Plan Change 1 to the Natural Resources Plan for the Wellington Region (**PC1**).

3 This statement of evidence relates to the matters in the Section 42A Report – Objectives and specifically the enterococci objectives included in Tables 8.1 and 9.1 of Objectives WH.O3 and P.O3, respectively.

QUALIFICATIONS AND EXPERIENCE

4 I hold a Bachelor of Science degree in chemistry and a Master of Science with Honours degree in chemistry, both from the University of Waikato. I also hold a PhD in marine biogeochemistry from Auckland University of Technology.

5 I have 12 years of experience in local government, consulting, and academia with a focus on resource management; ecological impact assessments; and designing, implementing, and reporting on monitoring programmes, including regional state of the environment programmes and a regional coastal recreational water quality programme. I have provided technical advice and reported on a range of coastal and marine activities and discharges, including marine farms, stormwater, wastewater treatment plants, ports, and marinas. I routinely assess activities against the requirements of the Resource Management Act 1991, New Zealand Coastal Policy Statement 2010, National Environmental Standards, and regional coastal plans. I have also prepared and presented ecological evidence previously at Council hearings and the Environment Court.

6 I have been involved in this process since December 2024.

CODE OF CONDUCT

7 I have read the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2023 (Part 9). I have complied with the Code of Conduct in preparing this evidence. My experience and qualifications are set out above. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this evidence are within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

SCOPE OF EVIDENCE

8 My evidence addresses the enterococci (human contact) coastal water objectives within Objectives WH.O3 and P.O3 of PC1 in Whaitua Te Whanganui-a-Tara (**TWT**) and the Te Awarua-o-Porirua (**TAoP**) Whaitua.

9 This evidence relies on the following information:

9.1 Technical evidence of John Oldman (DHI), providing the output of the modelled scenarios;

9.2 Information in PC1, with specific reference to objectives and policies relating to coastal recreational water quality and, more specifically, the enterococci objectives in Tables 8.1 and 9.1 - Coastal water objectives for TWT and TAoP, respectively;

9.3 Information in Section 32 report: Part B Implementation of the National Objectives Framework for Whaitua Te Whanganui-a-Tara and Te Awarua-o-Porirua Whaitua for Proposed Plan Change 1 to the Natural Resources Plan for the Wellington Region, with specific reference to Section 3.14 *Coastal water objectives*, Part C Section 2.1.3 *Coastal water objectives: Objectives WH.O3 and P.O3*;

9.4 Background information contained in: Greer, M.J.C., Blyth, J., Eason, S., Gadd, J., King, B., Nation, T., Oliver, M., Perrie, A. 2023. Technical assessments undertaken to inform the target attribute state framework of proposed Plan Change 1 to the Natural Resources Plan for the Wellington Region. Torlesse Environmental Limited, Christchurch, New Zealand.

BACKGROUND CONTEXT

10 PC1 implements the National Policy Statement for Freshwater Management (**NPS-FM**) 2020 for TWT and TAoP. This involves setting objectives, policies, rules and other methods to manage activities such as urban development, earthworks, stormwater, wastewater and rural land use. Accordingly, PC1:

10.1 Defines target attribute states (**TAS**) for the compulsory attributes in Appendices 2A and 2B of the NPS-FM 2020;

10.2 Sets equivalent coastal water quality and ecology objectives; and

10.3 Establishes provisions that will contribute to the achievement of those TAS and coastal objectives.

11 Development of the TAS was underpinned by planning and technical work conducted in the TWT and TAoP Whaitua Implementation Programmes (**WIP**s). Through these processes, values and attribute states were identified by each Whaitua Committee. This resulted in recommendations for attribute state frameworks and the PC1 targets for enterococci for human health. Enterococci is a genus of bacteria measured in estuarine and marine waters as an indicator of faecal contamination; this is the counterpart to the measurement of *E. coli* in freshwaters.

12 The MfE/MoH (2003) guidelines[1] provide an estimated risk of gastrointestinal illness and respiratory infection following contact recreation in marine waters (e.g., swimming) based on average enterococci concentrations, which is summarised in **Table 1**. Note that these guideline values apply to the 95th percentile of a long-term dataset (generally ≥3 years) and not individual samples as they are for long-term grades.

[1] Ministry for the Environment and Ministry of Health (2003) Microbiological water quality guidelines for marine and freshwater recreational areas.

Table 1: Summary of enterococci guideline values and their associated illness risk from MfE/MoH (2003), Table H1.

95th percentile value of enterococci/100 mL	Estimated risk	
	Gastrointestinal illness	Acute febrile respiratory infection
≤ 40	< 1%	< 0.3%
41-200	1-5%	0.3-1.9%
201-500	5-10%	1.9-3.9%
> 500	> 10%	> 3.9%

13 The attribute state framework for human health for recreation in coastal waters from the TAoP WIP was based on the MfE/MoH (2003) guidelines and supplemented to align with the equivalent table for *E. coli* for primary contact sites in the NPS-FM (Table 22) by adding an attribute state titled "*Percentage of exceedances over 500 enterococci per 100 mL*". This table is presented below (**Table 2**).

Table 2: Human health for recreation state table from the TAoP WIP

Value	**Human health for recreation**		
Attribute	Enterococci		
Attribute unit	Enterococci/100 mL		
Attribute state	**Numeric attribute state**		**Narrative attribute state**
	95 percentile (cfu/100 mL)	**Percentage of exceedances over 500 enterococci per 100 mL**	
A	≤40	≤5%	Estimated GI risk is <1% and AFRI risk is <0.3% from a single exposure. The estimated GI risk is >10% and AFRI risk is >4% less than 5% of the time
B	≤200	≤10%	Estimated GI risk is 1-5% and AFRI risk is 0.3-2% from a single exposure. The estimated GI risk is >10% and AFRI risk is >4% between 5 and 10% of the time.
C	≤500	≤20%	Estimated GI risk is 5-10% and AFRI risk is 2-4% from a single exposure. The estimated GI risk is >10% and AFRI risk is >4% between 10 and 20% of the time.
D	>500	>20%	Estimated GI risk is >10% and AFRI risk is >4% from a single exposure. The estimated GI risk is >10% and AFRI risk is >4% more than 20% of the time.
GI is gastrointestinal illness and AFRI is acute febrile respiratory infection			

14 Further analysis of the attribute state framework used in the TAoP and TWT WIPs found them to not be appropriate for use in PC1[2]. Specifically, this referred to the "*Percentage of exceedances over 500 enterococci per 100 mL*" statistic. The reasons for this were that the statistic was not supported by a quantitative microbial risk assessment (**QMRA**) and that the values were in direct conflict with the 95th percentile threshold. As such, only the 95th percentile targets in the WIPs were carried through to PC1 (Tables 8.1 and 9.1).

[2] see Greer et al. 2023, Section 12.1 Enterococci

COMPARISON OF EXISTING AND PROPOSED TARGETS

15 The operative Natural Resources Plan includes an objective (**O18**) that coastal waters are suitable for contact recreation (and Māori customary use). Targets to enable this objective are in Table 3.3 and these are ≤540 *E. coli* per 100 mL for estuaries and ≤500 enterococci per 100 mL for the open coast and harbours; this is based on the 95th percentile of at least 30 data points collected over three years. A footnote to Table 3.3 classifies TWT and TAoP harbours as harbours so the applicable target is enterococci. Achieving this target means that there is a ≤10% risk of gastroenteritis following swimming.

16 Tables 8.1 and 9.1 of the notified version of PC1 adopt the proposed enterococci targets from the TWT and TAoP WIPs as coastal objectives. For Wellington Harbour (including its estuaries) the Pāuatahanui Inlet (**the Pāuatahanui arm**) of Te Awarua-o-Porirua Harbour (**TAoP Harbour**) and the Open Coast (in TAoP) the target is ≤200 enterococci per 100 mL, while for the Onepoto arm of TAoP Harbour, the objective is ≤500 enterococci per 100 mL. The other coastal water management units, which include Mākara Estuary, Wainuiomata Estuary, and Wai Tai, have a proposed objective of "maintain or improve".

17 In general, PC1 proposes to implement more stringent enterococci targets than the operative NRP in all coastal management units except the Onepoto arm of TAoP harbour, where the NRP objective of ≤500 enterococci per 100 mL is maintained, and the Mākara Estuary, Wainuiomata Estuary, and Wai Tai where the objective is "maintain or improve".

ASSESSMENT OF CURRENT STATE AGAINST THE PROPOSED PC1 ENTEROCOCCI OBJECTIVES AND ESTIMATED REDUCTIONS REQUIRED TO ACHIEVE THE OBJECTIVES

18 As noted earlier in my evidence, notified PC1 proposed enterococci coastal water objectives of ≤200 or ≤500 enterococci/100 mL (95th percentile), or "maintain or improve". Here, I assess the current state of recreational water quality and the amount of change required to achieve these objectives. I highlight where substantial reductions would be required that may result in them being difficult to achieve.

Available data

19 Recreational water quality monitoring is conducted at a number of coastal locations throughout TWT, TAoP, and Wai Tai / Open Coast (monitoring enterococci concentrations). This provides a robust understanding of long-term baseline water quality at these locations.

20 Recreational sites are monitored during the summer months by Council. These data are publicly available on the Land and Water Aotearoa (**LAWA**) website.[3] These locations are indicative of popular swimming locations and are the basis of the locations assessed in my evidence. The 5-year, 95th percentile of enterococci concentrations as of 17 December 2024 is used as the current state in my assessment in this evidence.

21 In addition to measured estimates of the current state, modelled concentrations throughout TAoP Harbour are available for the period between 2004 and 2014 (Oldman 2019). When paired with the estimated freshwater *E. coli* loads presented in Greer (2025)[4], this modelled baseline allows an estimation of reduced enterococci loads in the harbour based on meeting two freshwater scenarios (further described in Dr Greer's evidence):

21.1 The current freshwater *E. coli* TAS for rivers in the TAoP Whaitua; and

21.2 The NPS-FM 2020 minimum required improvement (MRI) in freshwater *E. coli* concentrations in the TAoP Whaitua (i.e., one attribute state – See Clause 3.11(3) of the NPS-FM 2020),

22 How reductions in *E. coli* might translate to enterococci concentrations in TAoP Harbour has been assessed via the Coastal Receiving Environment Scenario Tool (CREST) which is described in Mr John Oldman's Statement of Primary Evidence.[5] Briefly, CREST allows a user to input sub-catchment load reduction scenarios and compare model results to baseline (current land use) estimates.

23 Due to the difference in model data availability, slightly different approaches have been taken when discussing the current and target states of enterococci at sites within the TAoP and TWT Whaitua. I discuss each Whaitua separately in the following sections.

Sites within TAoP

24 Site locations within TAoP included in the recreational water quality monitoring programme and assessed here are shown in **Figure 1**.

[3] lawa.org.nz
[4] Greer M. 2025. Approach used to estimate load reductions to achieve the copper, zinc and *E. coli* TAS in Proposed Change 1 to the Natural Resources Plan for the Wellington Region.
[5] See paragraphs 28-33.

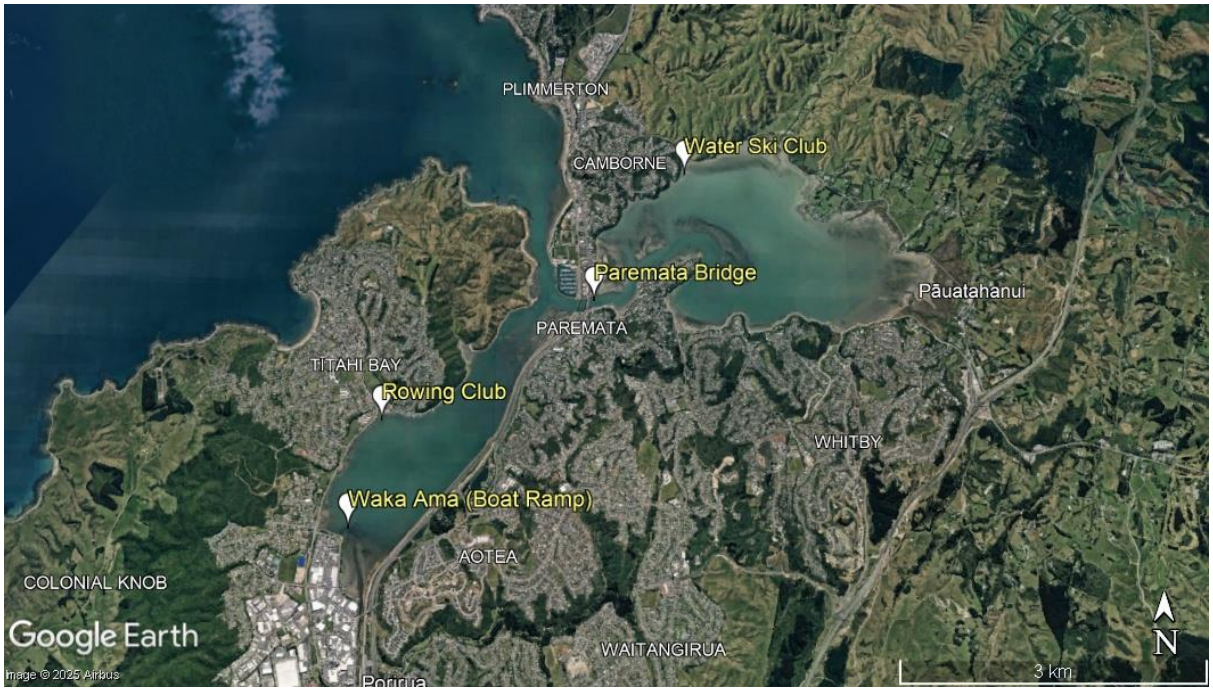

Figure 1: Council recreational water quality monitoring locations in TAoP.

25 The available monitoring data indicate that the current state of all four sites monitored in TAoP Harbour would not meet the proposed PC1 enterococci objective (**Table 3**). In contrast, under the modelled (**CREST**) baseline the Water Ski Club site does meet the objective (**Table 3**). Such differences in measured and modelled results are expected due to differences in the period they represent (2017 for baseline and 2022-2024 for current state), the variability and uncertainty associated with modelling approaches, and the naturally high variability of coastal water quality. Nevertheless, I note that modelled and measured estimates of state presented in **Table 3** are generally in the same 'ballpark' at most sites.

26 Regarding the extent to which compliance with freshwater targets will drive improvement in enterococci concentrations in TAoP Harbour towards the PC1 objectives, based on the outputs from CREST it is estimated that:

26.1 The *E. coli* load reductions required to meet the current PC1 TAS for rivers in the TAoP Whaitua (See Greer 2025)[6] will likely result in the achievement of the PC1 coastal objective at all sites in the TAoP Harbour, with all sites, except Waka Ama predicted to have 95th percentile concentrations <200 enterococci/100 mL; and

[6] Greer M. 2025. Approach used to estimate load reductions to achieve the copper, zinc and *E. coli* TAS in Proposed Change 1 to the Natural Resources Plan for the Wellington Region.

26.2 If *E. coli* loads are only reduced to the extent required to achieve MRI (i.e., a one-attribute state improvement) for rivers in the TAoP Whaitua, three of the four sites monitoring sites in the TAoP Harbour would meet the PC1 objective <500 enterococci/100 mL (**Table 3**). However, it is predicted that, despite improving by an estimated 60% from the modelled baseline, 95th percentile concentration at Waka Ama site would still be more than two times higher than the PC1 objective (1308 enterococci/100 mL).

27 These results suggest that the actions required to achieve the freshwater *E. coli* TAS for rivers in the TAoP Whaitua are also likely to result in the achievement of the enterococci costal objectives for TAoP Harbour. Making the freshwater TAS more lenient (as requested by a number of submitters) and only requiring the NPS-FM 2020 *E. coli* MRI is likely to result in freshwater TAS that are still generally consistent with achieving the enterococci coastal objectives through most of the TAoP Harbour. This suggests that in addition to being consistent with the best available MfE/MoH (2003) guidance, the current enterococci objectives for TAoP Harbour are also likely to be achieved through the actions necessary to meet the *E. coli* requirements of the NPS-FM 2020. Importantly, however, this does not apply at the Waka Ama site.

28 Sites exceeding 500 enterococci per 100 mL may not be suitable for human contact and may require signage to inform the public of health risks at this location. As Waka Ama site is a popular location for recreational use, I consider that the current objective of ≤500 enterococci per 100 mL is appropriate following the MfE/MoH (2003) guidance, even though I acknowledge that the 90% reduction in FIB load required to achieve this objective is going to be difficult to achieve (the financial implications of achieving this target in the context of freshwater TAS are discussed in Mr David Walker's Statement of Primary Evidence). Thus, I consider that if the freshwater TAS are made more lenient, future management of faecal contamination should focus directly on achieving the coastal outcomes, as it will no longer be possible to rely on the achievement of the freshwater TAS as a mechanism to achieve the coastal enterococci objectives.

Table 3: Summary of current state and modelled future states in TAoP (all values are 95th percentile of enterococci per 100 mL. Where TAS = Target attribute state and MRI = minimum required improvement. Colours correspond to the attribute state in

Table **2** (A = blue; B = green; C = yellow; D = orange). Current state as at 14 November 2024.

Site	Monitored (5-year, summer)		CREST Scenario Outputs					PC1 Objective	% reduction from monitored current state
	Current	Current State	Baseline	TAS		MRI			
				State	(% reduction from baseline)	State	(% reduction from baseline)		
Waka Ama	2680	D	3270	262	92	1308	60	500	81
Rowing Club	1820	D	1079	87	92	432	60	500	73
Paremata Bridge	378	C	119	31	74	62	48	200	47
Water Ski Club	1083	D	357	103	71	193	46	200	82

Sites within TWT, Wai Tai, Open Coast and Mākara and Wainuiomata Estuaries

29 There are no relevant modelled scenarios for sites within TWT, Wai Tai, Open Coast and Mākara and Wainuiomata Estuaries[7] so a different approach was required to assess these sites against the proposed PC1 objectives than for sites in TAoP. For these sites, the percentage reduction required to meet targets of ≤200 enterococci/100 mL (current PC1 coastal objective) and ≤500 enterococci/100 mL are presented (

[7] There are no monitoring sites in the Mākara and Wainuiomata Estuaries. Thus, these areas are not assessed numerically in this statement of evidence.

30 **Table** 4). The ≤500 enterococci/100 mL threshold has been considered (in addition to the current coastal objective) as it is an appropriate target for sites used for recreational (human contact) following the MfE/MoH (2003) guidance[8]. Thus, it could be adopted as a possible alternative objective where the ≤200 enterococci/100 mL objective may be unfeasible or difficult to achieve.

31 To provide a threshold at which the proposed PC1 objective may be difficult to achieve, I have used a reduction value of 50%. This is subjective but generally aligns with a similar threshold used to identify if a TAS would be difficult to meet based on stormwater or wastewater mitigations.[9] The reduction required to achieve the ≤500 enterococci/100 mL objective was only done for sites where a greater than 50% reduction would be required to meet the ≤200 enterococci/100 mL objective.

32 There are 28 sites monitored within TWT. A summary of the change required for the proposed PC1 objectives is as follows:

32.1 Ten sites had a current state of <200 enterococci/100 mL (i.e., meet the current PC1 coastal objectives);

32.2 Ten sites would require a reduction of <50% to achieve the ≤200 enterococci/100 mL objective (i.e., do not currently meet the current PC1 objective but potentially could).

32.3 Three[10] sites would require a reduction of >50% to achieve the ≤200 enterococci/100 mL objective but <50% to achieve a ≤500 enterococci/100 mL objective (i.e., unlikely to meet PC1 coastal objective now or in the future but potentially could meet a less stringent objective of ≤500 enterococci/100 mL).

32.4 Two[11] sites would require a reduction of >50% to meet a ≤500 enterococci/100 mL objective (i.e., unlikely to meet PC1 coastal objective now or in the future and unlikely to meet a less stringent objective of ≤500 enterococci/100 mL by 2040).

33 From this assessment, the greatest reductions from the current state would be required at the Wellington City Waterfront at Shed 6, Wellington Harbour at Taranaki St Dive Platform,

[8] See above at para **Error! Reference source not found.**.
[9] See Dr Greer's Statement of Evidence, at para 206.
[10] Petone Beach at Water Ski Club, Petone Beach at Sydney Street, and Petone Beach at Kiosk.
[11] Wellington City Waterfront at Shed 6 and Wellington Harbour at Taranaki St Dive Platform.

and Ōwhiro Bay sites. In the past five years, monitoring results indicate that each of these locations was suitable for swimming 74% of the time (i.e., the enterococci concentration at the time of sampling was <280 enterococci/100 mL – the single sample alert threshold from MfE/MoH (2003)). This indicates that these sites experience infrequent but very high concentrations of faecal bacteria.

Table 4: Summary of current state and reductions required to meet PC1 objectives in TWT and Wai Tai / Open Coast. Cell colours correspond to the attribute state in

Table **2** (A = blue; B = green; C = yellow; D = orange). Reductions >50% are highlighted in red and underlined. Current state as at 14 November 2024.

Site	**Current (5-year, summer)**		**% reduction from current state to achieve:**		**PC1 Target** (95th %ile)
	95th %ile	**Current State**	**200 enterococci/ 100 mL**	**500 enterococci/ 100 mL**	
Te Whanganui-a-Tara (Harbour and estuaries)					
Petone Beach at Water Ski Club	574	D	65	13	200
Petone Beach at Sydney Street	920	D	78	46	
Petone Beach at Kiosk	660	D	70	24	
Sorrento Bay	356	C	44		
Lowry Bay at Cheviot Road	256	C	22		
York Bay	233	C	14		
Days Bay at Wellesley College	208	C	4		
Days Bay at Wharf	148	B	Currently met		
Days Bay at Moana Road	272	C	26		
Rona Bay at N end of Cliff Bishop Park	474	C	58		
Rona Bay at Wharf	249	C	20		
Robinson Bay at HW Shortt Rec Ground	156	B	Currently met		
Robinson Bay at Nikau Street	101	B	Currently met		
Wellington City Waterfront at Shed 6	1365	D	85	63	
Whairepo Lagoon	404	C	50		
Wellington Harbour at Taranaki St Dive Platform	1800	D	89	72	
Oriental Bay at Freyberg Beach	51	B	Currently met		
Oriental Bay at Wishing Well	200	B	Currently met		
Oriental Bay at Band Rotunda	423	C	53		
Balaena Bay	315	C	37		
Hataitai Beach	254	C	21		
Shark Bay	185	B	Currently met		
Mahanga Bay	148	B	Currently met		
Scorching Bay	28	A	Currently met		
Worser Bay	253	C	21		
Seatoun Beach at Wharf	173	B	Currently met		
Seatoun Beach at Inglis Street	220	C	9		

Site	Current (5-year, summer)		% reduction from current state to achieve:		PC1 Target (95th %ile)
	95th %ile	Current State	200 enterococci/ 100 mL	500 enterococci/ 100 mL	
Breaker Bay	51	B	Currently met		
Wai Tai					
Lyall Bay at Tirangi Road	452	C	56		Maintain or improve
Lyall Bay at Onepu Road	165	B	Currently met		
Lyall Bay at Queens Drive	149	B	Currently met		
Princess Bay	23	A	Currently met		
Island Bay at Surf Club	574	D	65	13	
Island Bay at Reef St Recreation Ground	896	D	78	44	
Island Bay at Derwent Street	142	B	Currently met		
Ōwhiro Bay	1051	D	81	52	
Open Coast (TAoP)					
Karehana Bay at Cluny Road	408	C	51		200
Plimmerton Beach at Bath Street	628	D	68	20	
Plimmerton at South Beach	738	D	73	32	
Tītahi Bay at Bay Drive	293	C	32		
Tītahi Bay at Toms Road	218	C	8		
Tītahi Bay at South Beach Access Road	458	C	56		
Mākara and Wainuiomata Estuaries					
No monitoring sites			Unknown		Maintain or improve

RESPONSE TO SUBMITTERS

34 In the following paragraphs, I respond to submission points that relate specifically to coastal human contact.

Baseline state

35 A number of submissions related to the lack of baseline data, which made it not possible to determine whether the proposed targets are reasonable, appropriate, and achievable. I have included current state information for all coastal recreational sites in my evidence based on the last five years of monitoring, which I consider appropriate for making these

considerations. Further, I have used the current state data and assessed the amount of change required to achieve the proposed PC1 objectives.

Enterococci targets in Wai Tai / Open Coast

36 EDS and Forest & Bird seek for the Wai Tai / Open Coast targets for enterococci to be reduced from ≤200 to ≤40 enterococci/100 mL. I do not agree with this submission. Open coast sites are typically expected to have higher water quality than estuarine sites because of lower influences from land use. The recreational sites located in Wai Tai / Open Coast are all close to the mouth of an estuary and typically within an urbanised bay; therefore, these sites are highly influenced by estuarine water quality and land use, making them more similar to estuarine sites than open coast sites. Some locations, for example, Ōwhiro Bay and Lyall Bay are also exposed to discharges from wastewater outfalls. These sites may not be expected to have water quality as good as locations further away from substantial estuarine or developed catchment influences. As such, I consider an objective of ≤200 enterococci/100 mL appropriate for the monitored sites in Wai Tai / Open Coast. Efforts to improve water quality within TWT and TAoP will inherently improve water quality at recreational locations near the estuary mouth.

Faecal coliforms

37 EDS and Forest & Bird seek to include a target for faecal coliforms. I do not agree with this submission. The recreational water quality guidelines (MfE/MoH, 2003) provide guidelines for faecal coliforms as a water quality indicator of the suitability of shellfish gathering (i.e., if the guideline is met, shellfish are likely to be suitable for gathering). The guidelines are: 1) a long-term median faecal coliform concentration <14 MPN/100 mL, and 2) no more than 10% of samples should exceed 43 MPN/100 mL.

38 The reliability of faecal coliforms as an indicator of the suitability of shellfish gathering has been questioned over time. A recent report commissioned by MfE[12] stated that "*While FIB* [faecal indicator bacteria] *provide valuable information about the faecal contamination status of shellfish harvesting waters and flesh, evidence relating FIB in shellfish to human health is moderate at best as their presence does not always reliably predict the presence*

[12] Stott, R., Wood, D. (2024). Faecal indicator bacteria in shellfish. In: Lohrer, D., et al. *Information Stocktakes of Fifty-Five Environmental Attributes across Air, Soil, Terrestrial, Freshwater, Estuaries and Coastal Waters Domains*. Prepared by NIWA, Manaaki Whenua Landare Research, Cawthron Institute, and Environet Limited for the Ministry for the Environment. NIWA report no. 2024216HN (project MFE24203, June 2024). [https://environment.govt.nz/publications/information-stocktakes-of-fifty-five-environmental-attributes]

of pathogens, nor do they relate to non-faecal derived pathogens or marine biotoxins which can present a significant risk to shellfish consumers." As such, it is my opinion that faecal coliforms should be omitted from the coastal objectives due to their low reliability.

39 Alternatively, the Ministry of Primary Industries test shellfish and seawater for toxic algae weekly from popular shellfish gathering areas around New Zealand.[13] If the shellfish are potentially not safe to eat, they issue public health warnings and put up signs at affected beaches. This approach provides an element of protection to shellfish gathers from shellfish toxins; however, this is notably a different issue to faecal contamination.

CONCLUSIONS

40 Recreational water quality monitoring is conducted weekly during the summer months (November to March, inclusive) at a number of coastal locations throughout TWT, TAoP, Wai Tai and Open Coast (TAoP) (monitoring enterococci concentrations). This provides a robust understanding of the current state of quality at these locations.

41 I consider that having an objective of no more than ≤500 enterococci per 100 mL is appropriate at locations used for recreational (human contact) following the MfE/MoH (2003) guidance. Sites exceeding 500 enterococci per 100 mL may not be suitable for human contact and may require signage to inform the public of health risks at this location.

42 The available monitoring data indicate that the current state of all four sites monitored in TAoP Harbour would not meet the proposed PC1 enterococci objective (**Table 3**). However, modelling suggests that the *E. coli* load reductions required to meet the current PC1 TAS for rivers in the TAoP Whaitua will likely result in the achievement of TAoP Harbour enterococci objectives at all sites.[14] The same modelling also suggests that more lenient freshwater *E. coli* TAS for rivers in the TAoP Whaitua would be inconsistent with the achievement of the enterococci coastal objective at the popular Waka Ama recreational site. As stated above, I do not consider it appropriate to increase the coastal objective at this site from a human health perspective, although I do acknowledge it will be difficult to achieve the current objective by 2040. Consequently, I consider that if the freshwater *E. coli* TAS are made more lenient, future management of faecal contamination will need to focus directly on reducing faecal contamination at this site, as it will no longer be possible

[13] https://www.mpi.govt.nz/fishing-aquaculture/recreational-fishing/where-unsafe-to-collect-shellfish/shellfish-biotoxin-alerts/

[14] See Greer M. 2025. Approach used to estimate load reductions to achieve the copper, zinc and *E. coli* TAS in Proposed Change 1 to the Natural Resources Plan for the Wellington Region.

to rely on the achievement of the freshwater TAS as a mechanism to achieve the coastal enterococci objectives.

43 Of the 28 sites in TWT and six sites in Open Coast (**TAoP**) that have a proposed PC1 objective of ≤200 enterococci/100 mL:

43.1 Ten sites meet the current PC1 coastal objective and there is no scientific justification for amending that objective at these sites.

43.2 For a further ten sites, the objective has not been identified as being difficult to achieve (i.e., requiring a >50% reduction in enterococci concentration) despite that objective not currently being met. In my opinion the current objectives ≤200 enterococci/100 mL should be retained at these sites.

43.3 For three[15] sites, the current objective of ≤200 enterococci/100 mL has been identified as potentially difficult to achieve. However, an alternative threshold of ≤500 enterococci/100 mL may be more readily achieved. In my opinion an amended target of ≤500 enterococci/100 mL would still be consistent with MfE/MoH (2003) guidance.

43.4 For two sites[16] even the less stringent target of ≤500 enterococci/100 mL objective has been identified as difficult to achieve. Nevertheless, I do not consider it appropriate to make the coastal objective for these sites more lenient than ≤500 enterococci/100 mL as sites exceeding this threshold may not be suitable for human contact and may require signage to inform the public of health risks at this location.

44 If coastal enterococci objectives were applied to sites (see **Table 3** and **4**) it is my opinion that the current numbers in Table 8.1 and 9.1 should generally be applied directly to the relevant sites. However, I note that:

44.1 There is justification for increasing the objective from ≤200 enterococci/100 mL to ≤500 enterococci/100 mL at the following sites (all in Wellington Harbour):

44.1.1 Petone Beach at Water Ski Club;

44.1.2 Petone Beach at Sydney Street;

[15] Petone Beach at Water Ski Club, Petone Beach at Sydney Street, and Petone Beach at Kiosk.
[16] Wellington City Waterfront at Shed 6 and Wellington Harbour at Taranaki St Dive Platform.

44.1.3 Petone Beach at Kiosk;

44.1.4 Wellington City Waterfront at Shed 6; and

44.1.5 Wellington Harbour at Taranaki St Dive Platform.

44.2 Even with the amendments listed above the objectives will be difficult to achieve at the following sites:

44.2.1 Waka Ama (Onepoto Arm of TAoP Harbour);

44.2.2 Wellington City Waterfront at Shed 6 (Wellington Harbour); and

44.2.3 Wellington Harbour at Taranaki St Dive Platform (Wellington Harbour)

44.3 There are no monitoring sites with the Mākara and Wainuiomata Estuaries for human contact, which makes the proposed objective of 'Maintain or Improve' ambiguous due to its unknown current state.

45 I do not agree with submissions requesting:

45.1 The Wai Tai / Open Coast objectives for enterococci be reduced from ≤200 to ≤40 enterococci/100 mL; or

45.2 The inclusion of an objective for faecal coliforms in Tables 8.1 and 9.1 of PC1.

DATE: 28 FEBRUARY 2025

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ON BEHALF OF GREATER WELLINGTON REGIONAL COUNCIL.