

BEFORE THE HEARING PANEL

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of an application by Winstone Pulp International Limited (WPI) to the Manawatū-Whanganui Regional Council **(APP-2006012018.03)** for land disturbance associated with the construction of a wetland and for the discharge of up to 750 m³/day of condensate wastewater associated with proposed wood processing operations.

REPORT TO THE COMMISSIONERS

MR TREVOR ROBINSON (CHAIR), MR GREG RYDER, MS MIRIA POMARE

SECTION 42A REPORT OF DR OLIVIER AUSSEIL – WATER QUALITY AND ECOLOGY, TRAVERSE ENVIRONMENTAL LTD, ON BEHALF OF THE MANAWATŪ-WHANGANUI REGIONAL COUNCIL

22 September 2026

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A. INTRODUCTION

Qualification and Experience

1. My full name is Olivier Michel Nicolas Ausseil (pronounced “O-Say”).
2. I am a Principal Scientist and Director of Traverse Environmental Limited (previously Aquanet Consulting Ltd). I have the following qualifications and experience relevant to the evidence I shall give.
3. I hold a PhD of Environmental Biosciences, Chemistry and Health from the University of Provence, France. I also hold a Master of Science Degree of Agronomical Engineering from the National Higher Agronomical School of Montpellier, France, and a DEA (equivalent Masters Degree) in Freshwater Environmental Sciences from the University of Montpellier II, France.
4. I have over 20 years’ experience in New Zealand as a scientist working in local government and as a private consultant working for regional councils and local authorities, central government and government agencies, iwi / hāpū, catchment and community groups and the private sector.
5. Prior to forming Aquanet Consulting Ltd in June 2007, I was employed by Horizons Regional Council from July 2002 to June 2007, where I held the positions of Project Scientist, Environmental Scientist - Water Quality, and Senior Scientist - Water Quality.
6. I have been involved in providing freshwater technical advice and supporting the development of regional freshwater policies in several regions in New Zealand since 2005, including the Manawatū-Whanganui, Hawke’s Bay, Greater Wellington, Canterbury, Waikato and Gisborne regions. I authored a series of technical reports that formed the basis for most of the numerical targets presently found in the Manawatū -Wanganui Regional Plan (‘One Plan’).
7. I have worked as a technical advisor on behalf of the consenting authority, the applicant and/or submitters on well over 150 resource consent applications, compliance assessments and/or prosecution cases for a wide range of activities, including municipal

and industrial wastewater and stormwater discharges to water, water abstractions, river works, infrastructure and land use development activities.

8. My work routinely involves providing assessment of effects on water quality and/or aquatic ecology; recommending, or assessing compliance with, resource consent conditions; and designing or implementing water quality/aquatic ecology monitoring programmes, at the scale of a specific activity and at a wider catchment or regional scale.
9. I have been engaged by Horizons Regional Council ('Horizons') to undertake an independent professional review of the surface freshwater quality and ecology assessments provided as part of the resource consent applications by WPI.
10. I am familiar with the WPI pulp mill site, the proposed discharge location and the Whangaehu River and its catchment through my involvement in the previous resource consent application by WPI in 2010-2011, when I was engaged by Horizons as independent water quality and ecology expert, and previous work in the Ruapehu and Rangitikei districts.
11. As part of my technical review role for Horizons, I participated in meetings with the Applicant's team, discussed the freshwater ecological survey with Ms Treffery Barnett (Babbage Consultants, author of the freshwater ecology memo (#07), and contributed to Horizons' S92 request for further information.
12. I confirm that I am familiar with the Code of Conduct for Expert Witnesses as set out in the Environment Court Code of Conduct for Expert Witnesses Practice note 2023. I have read and agree to comply with the Code. Except where I state that I am relying upon the specified evidence or advice of another person, my evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

B. OUTLINE OF EVIDENCE

13. As part of this technical assessment, I have reviewed the following documents that I have considered and understood to represent the most up to date information from the Applicant

that are of relevance to the water quality and ecology aspects of the project (document numbers are as per the application bundle):

- a. The application letter dated 9 July 2026
 - b. The Application, AEE Discharge renewal dated March 2025 (#15(01))
 - c. The Planning report (#04), in particular sections 3, 6, 7 and 8)
 - d. Technical memo 1 (Project summary and torrefaction) (#05)
 - e. Technical memo 2 (Water quality assessment) (#06)
 - f. Technical memo 3 (Ecology) (#07)
 - g. Technical memo 8 (Whangaehu River framework) (#08)
 - h. Section 92 Applicant Response dated 11 June 2026 (#14)
 - i. Section 92 Applicant Response dated 9 September 2025 (#15(02))
14. I have also read the submissions received, with a focus on any water quality or ecology matters raised.
15. In this report I have provided the following:
- a. A description of the water quality and ecology of the receiving environment, the Whangaehu River, including an assessment against the One Plan¹ targets and NPS-FM attribute states (“bands”);
 - b. A description of the proposed activity, being the discharge of up to 750 m³/day of condensate wastewater from proposed wood processing operations at Tangiwai to the Whangaehu River;
 - c. An assessment of the potential effects of the proposed activity on water quality and ecology of the Whangaehu River, including against the One plan targets and NPS-FM attribute states.
 - d. A comment on relevant matters in relation to water quality and ecology matters raised in submissions.

¹ All references to the One Plan in this report are to the current online version, as amended on 12 March 2026, unless otherwise specified <https://www.horizons.govt.nz/your-council/plans-and-strategies/one-plan/one-plan-as-amended-by-pa6-2026> (Accessed September 2026)

16. The scope of my review is limited to the potential effects of the discharge of condensate wastewater on the surface water quality and ecology of the Whangaehu River. My review does not cover potential effects on air, soil or groundwater or potential effects from the construction of the wetland.
17. In accordance with section 42A (1A) and (1B) of the RMA, I have minimised the repetition of information included in the application and where I have considered it appropriate, adopted that information.
18. In preparing this report, I have relied upon the expert evidence to this section 42A report from the following:
 - a. A technical memo from Ms Jenny Simpson related to the air discharge. Ms Simpson's review includes a review of the likely composition of the liquid fraction (condensate) of the torr gas combustion process, which is of particular relevance to my assessment. The gas combustion process, which drives the composition of the condensate, is outside my area of expertise. I have thus relied on Ms Simpson's expert opinion on these matters.
 - b. Mr Kerry Pearce's s 42A report on erosion and sediment control and earthworks associated with the construction of the proposed wetland.
 - c. A technical memo from Mr James Blackwell related to contaminated land matters, particularly in relation to the proposed HDPE liner, seepage, and the potential for contaminants in underlying soils to enter the wetland discharge and subsequently the Whangaehu River.

C. APPLICATION AND PROPOSED DISCHARGE

19. The application I have reviewed is for the discharge of up to 750 m³/day of condensate from a torrefaction wood processing plant to the Whangaehu River at the same discharge point as the historical discharge from the site's pulp mill. The existing outfall is located on the true left bank of the river, approximately 700 metres upstream of the Tangiwai railway bridge.
20. The daily volume of the proposed discharge is up to 750 m³/day. I have thus assumed in my assessment that the discharge volume was always 750 m³/day. This is an environmentally

conservative assumption, that was also made in the application's water quality assessment (Technical memo 02, section 5).

21. The application's water quality assessment assumed a constant discharge rate of 0.00868 m³/s (8.7 L/s). I did not find any additional information in the application further characterising the discharge rates, such as median or average flows and whether the discharge will be relatively constant or made of "pulses". While the discharge from the torrefaction plant may be somewhat variable, I expect the passage through the constructed wetland will significantly attenuate any flow peakiness, given the stated minimum retention time of 2.8 days². On this basis, I am comfortable with the discharge flow rate assumptions made in the water quality assessment.
22. The proposed condensate discharge quality is summarised in Table 1 of the application's water quality assessment, which provides "average" concentrations of a range of contaminants. The application's water quality assessment, and my review, are based on this assumed discharge quality. I do note, however, that:
 - a. The proposed condensate quality is based on limited analytical results from a Danish facility. No indication of spread around the proposed "average" discharge quality was provided, although I appreciate this may be difficult to evaluate in the absence of an operational plant and discharge. It would be useful if information about expected peak concentrations in the discharge could be provided by the Applicant in their s 41 B report;
 - b. Further information was requested on the expected quality of the discharge. Based on information provided in the s 92 response dated June 2026 (#14), it is my understanding that most organic compounds that could be expected to be present in the torr and biomass combustion gases are expected to be destroyed by the high combustion temperature of 850 °C. As a result, the concentrations of organic compounds (such as volatile organic compounds, dioxins and furans, terpenes, organic acids etc.) in the condensate are expected to be "very low".

² Application Technical Memo 2 - water quality (#06), Table 2.

- c. I have discussed with Ms Simpson aspects relating to the likely chemical composition of the discharge, and understand she generally agrees with these conclusions, as long as the combustion peak temperature and time at peak temperature (2 seconds at or above 850 °C) described in the application are achieved. I have relied on Ms Simpson's conclusions as detailed in her memorandum in relation to these matters.
- d. In practice, and in the absence of an operational plant, the actual quality of the future discharge is unknown, and I suggest it will have to be tested once the plant and discharge are operating to verify it is consistent with the proposal (see recommendations, paragraphs 47-48).

D. RECEIVING ENVIRONMENT

- 23. The Whangaehu River takes its source at the Mt Ruapehu Crater Lake. Upstream of Tangiwai (i.e. the WPI discharge point), it is a fast-flowing river, on a bed of boulders and large cobbles. Downstream of Tangiwai, it receives a number of significant tributaries, including the Waitangi Stream and the Tokiahuru Stream, before entering a gorge section. Further downstream, the lower Whangaehu is joined by its largest tributary, the Mangawhero River, before flowing into the Tasman Sea just west of Rātana.
- 24. Land use in the Whangaehu River catchment above the WPI discharge point is composed of native land cover (53%), exotic forestry (25%) and sheep and beef farming (22%)³. It is my understanding there are no significant point-source discharges upstream of the WPI site.
- 25. The source of the Whangaehu River is the outlet of Mt Ruapehu's Crater Lake, which profoundly influences the river's water quality. Periodic overflows from the Crater Lake have a natural influence on the Whangaehu River's water quality, including (Table 3):
 - a. Very acidic waters: median pH of 2.6 upstream of the discharge over the last 5 years,
 - b. High suspended solids and turbidity, causing low water clarity for a mountain river (median clarity of 0.3 m upstream of the discharge),

³ <https://www.freshwater-scenario-builder.co.nz/rivers>

- c. High phosphorus concentrations: median DRP and TP concentrations of 0.089 and 0.091 mg/L respectively,
 - d. Moderately elevated ammoniacal-N concentrations, for a river unaffected by point-source discharges: 0.128 and 0.531 mg/L as median and 95th percentile concentrations, respectively.
 - e. All other common water quality determinands are consistent with a typical mountain river, such as relatively low nitrogen (DIN and TN), *E. coli*, temperature and cBOD₅ and high dissolved oxygen (DO).
26. Metal concentrations are relatively elevated, which is expected in volcanic/geothermal areas. Dissolved concentrations of most common metals (presented in the application's water quality assessment, Table 4) exceed the Australian and New Zealand Guidelines for Fresh and Marine Water Quality's default Guideline Values (DGVs).
27. The water management framework of the One Plan recognises the need to manage water bodies within the Region for the different environmental, social and economic values they hold. Water Management Areas (WMAs) and sub-areas (WMs-As) are the spatial component of the water management framework in the One Plan, made of forty-three WMAs and 124 WMs-As (One Plan, RP Schedule 1). The WPI discharge is located within the Upper Whangaehu WMs-A (Whau_1a).
28. Water body values associated with each surface WMs-A are listed in the One Plan's RP Schedule 2. The following values are listed for Upper Whangaehu WMs-A (these are area-wide values, therefore applicable to the Whangaehu River at the point of discharge):
- a. Life Supporting Capacity (LSC), Upstream Volcanic Acidic (UVA) class
 - b. Aesthetics (AE)
 - c. Contact Recreation (CR)
 - d. Mauri (Mau)
 - e. Industrial Abstraction (IA)
 - f. Irrigation (I)
 - g. Stockwater (SW)

- h. Existing Infrastructure (EI)
 - i. Capacity to Assimilate Pollution (CAP)
29. None of the reach-specific values identified in Schedule 2 for this sub-area are applicable to the reach of the Whangaehu River at, or near, the proposed discharge point.
30. The One Plan (Schedule 5) also defines water quality targets for each WMs-A. Table 1 below provides a brief summary of current compliance with key water quality targets. Upstream of the proposed discharge, the river meets the Ammoniacal-N and *E. coli* targets, but does not meet the DRP, DIN, pH or visual clarity targets, primarily due to natural factors.
31. Table 2 presents a summary of NPS-FM Attribute States (bands). The Whangaehu River upstream of the proposed discharge point is in Band C for ammonia, and band D for DRP and suspended fine sediment (SFS). These attribute states appear particularly poor for a mountain river with limited human activities in its upstream catchment, but, similarly to the exceedances of the One Plan targets, these are, in my opinion, primarily driven by natural factors.
32. A number of surveys of aquatic communities of the Whangaehu River in the vicinity of the proposed discharge point have been undertaken over the years, including in support of previous consent applications by WPI, e.g. Bioresarches (1985), Kingett Mitchell (2006), Golder Associates (2008) and, more recently, as described in the application's Freshwater Ecology memo (#07) (Babbage, 2026). The following (paragraphs 33 to 35) is a brief synthesis of these surveys.
33. Surveys of fish communities in the Whangaehu catchment indicate that fish generally do not appear to be present in the mainstem of the Whangaehu River⁴; however, there are sporadic records of obligatory migratory fish species (e.g. longfin eel, or tuna) in some of the Whangaehu River's tributaries, including the Waitangi Stream, indicating native fish must be able to successfully migrate the length of the Whangaehu River at least at times (unless of

⁴ There are no records of fish in the mainstem of the Whangaehu River in the New Zealand Freshwater Fish Database

course these eels were human-introduced). Some of the upper Whangaehu's tributaries (e.g. the Tokiahuru Stream and tributaries) hold locally significant trout fisheries.

34. A number of surveys show macroinvertebrate communities in the Whangaehu River near the proposed point of discharge tend to be characterised by low abundance and diversity of macroinvertebrates species. For example, the 2026 survey only found 6 or 7 individuals at each of the Whangaehu river sites vs. over 200 in the Waiohana Stream. It is likely that the species composition and low abundance primarily reflect macroinvertebrate drift and episodic re-colonisation from non-acidic tributaries, rather than permanent, established communities.
35. Periphyton communities in the Whangaehu River upstream of the proposed discharge tend to be characterised by low overall biomass, composed of thin diatom and/or green algae films. Visible heterotrophic growths (sewage fungus) were never recorded upstream of the discharge. A combination of low nutrient supply, frequent flow disturbance, acidic pH and low water clarity/high suspended solids are probably the key drivers of the low periphyton biomass.

Table 1: Assessment of water quality data collected between January 2020 and December 2024 in the Whangaehu River at the sites upstream from Winstone Pulp mill and at Kauangaroa, against the relevant One Plan water quality targets for Whau_1a (for Whangaehu at U/S Winstone Pulp Mill) and Whau_3a (for Whangaehu at Kauangaroa ('K')). Q is the river flow. FEP: Flow Exceedance Percentile.

One Plan targets	Statistic	Target	U/S Winstone Pulp mill	Kauangaroa
Total ammoniacal-N (mg/L)	Average	0.320	0.182 (Met)	0.032 (Met)
	Max	1.7	0.79 (Met)	0.143 (Met)
	Overall		Met	Met
Soluble Inorganic Nitrogen (SIN) (mg/L)	Average, when Q≤20th FEP	0.070	0.205	0.278
			Not met	Not met
Dissolved Reactive Phosphorus (DRP) (mg/L)	Average, when Q≤20th FEP	0.006	0.102	0.014
			Not met	Not met
pH	Range	U/S: 7.0-8.2 K: 7-8.5	0	48% (26/54)
			Not met	Not met
Visual clarity (m)	% compliance	3.0	0	0
	When Q≤50th FEP		Not met	Not met

<i>E. coli</i> (cfu/100mL)	% exceedances, 1 Nov to 30 Apr, when Q ₅₀ th FEP	260/100mL	0	6% (1/17)
	% exceedances, Q ₅₀ th FEP	550/100mL	0	11% (5/44)
			Met	Not met

Table 2: Assessment of water quality data collected between January 2020 and December 2024 in the Whangaehu River at the sites upstream from Winstone Pulp mill and at Kauangaroa, against the relevant NPS-FM attribute state bands.

NPS-FM attribute	Statistic	U/S Winstone Pulp mill	Kauangaroa
Un-ionised ammonia (toxicity) (mg/L)	Median	0.005 (B)	0.001 (A)
	95 th percentile	0.024 (C)	0.003 (B)
	Overall	C	B
Nitrate-nitrogen (toxicity) (mg/L)	Median	0.045 (A)	0.23 (A)
	95 th percentile	0.057 (A)	0.681 (A)
	Overall	A	A
Dissolved Reactive Phosphorus (DRP) (mg/L)	Median	0.089 (D)	0.011 (C)
	95 th percentile	0.362 (D)	0.034 (C)
	Overall	D	C
Suspended fine sediment (SFS) (m)	Median	0.26	0.15
		D	D
<i>E. coli</i> (cfu/100mL)	Median	2 (A)	87 (A)
	95 th percentile	2 (A)	3050 (D)
	Exceedances (%) > 260/100mL	0 (A)	30% (16/54) (B)
	Exceedances (%) > 540/100mL	0 (A)	20% (11/54) (D)
	Overall	A	D

E. ASSESSMENT OF EFFECTS

36. I note that the “historical” discharge from the pulp mill was very different (in terms of its quantity and quality) from the new, proposed discharge. Information about the historical discharge and its effects on the Whangaehu River (including river monitoring data downstream of the discharge point) is not directly relevant to the consent application under consideration and is thus not discussed in my review. Only the monitoring data for the site upstream of the discharge is relevant, as it represents the river in the absence of the proposed discharge, i.e. it represents the existing receiving environment.

37. The application's assessment of the potential effects of the condensate discharge on the water quality of the Whangaehu River relies on a very simple mass conservation (mass balance) approach, under a single, static scenario. The scenario assumes that:
- a. the maximum discharge volume (750 m³/d) is discharged to the Whangaehu River when the river is under low flow conditions (Mean Annual Low Flow, MALF). This results in an assumed dilution ratio of 1:266. This is an environmentally conservative assumption. In practice, the dilution ratio will be greater (and thus the resulting in-river concentrations lower) because the discharge is unlikely to be at the maximum volume all the time and the river will be at higher flows most of the time.
 - b. the wetland provides no removal of contaminants. In practice, this is also likely to be an environmentally conservative assumption, particularly with regard to metals and organic contaminants.
 - c. the discharge quality is equivalent to that of the proposed "average" discharge concentrations.
 - d. Full mixing is achieved (i.e. the in-river concentrations are calculated assuming full mixing of the discharge with the river's water).
38. The mixing characteristics of the discharge into the Whangaehu River are not, to my knowledge, discussed in the application documents. I have also not seen an assessment against the One Plan definition of reasonable mixing⁵. The Water Quality memo and the Planning Report appear to refer to the effects being assessed after either "mixing" or "reasonable mixing" interchangeably; however, the mass balance calculations supporting this conclusion assume full mixing (not reasonable mixing). In theory, the effects of the discharge must be assessed at the end of the zone of reasonable mixing. In my experience, the outcomes of a reasonable mixing assessment can be quite different from those assuming full mixing in many situations. However, in the specific situation of this discharge, I am comfortable that my conclusion that the potential effects of the discharge on the Whangaehu River's water quality are likely to be no more than minor, and meet S107(1)

⁵ A distance from the discharge point being the least of seven times the width of the river, the point at which the discharge reaches the full width of the river, or 200 metres.

standards, will hold true after reasonable mixing as defined in the One Plan. I have reached this conclusion by (1) considering the natural characteristics of the Whangaehu River's bed and flow at the point of discharge and how these may affect mixing characteristics (2) including a degree of environmental conservatism when considering the significance of the effects.

39. Overall, and although it does not account for potential “peak” concentrations in the discharge, the scenario used is environmentally conservative, and the very simple “static” scenario approach is sufficient given the overall conclusions that the discharge's effects are not likely to be more than minor (see below).
40. The outcomes of the application's assessment of the potential effects of the condensate discharge to the Whangaehu River assessment are summarised in Table 4 of the water quality assessment. I have checked the calculations and I am comfortable they are correct.
41. The potential effects of the discharge on water temperature do not appear, however, to be discussed in the application. The condensate water is expected to be significantly warmer (c. 50 °C) than the receiving environment and could potentially cause a temperature increase in the Whangaehu River. Using a simple heat balance approach with environmentally conservative scenarios (discharge temperature: 50 °C, river temperature 0-10 °C, dilution ratio 1:266), the maximum potential temperature increase caused by the discharge after full mixing would be less than 0.2 °C. In practice, I expect the condensate temperature will be buffered in the wetland to close to ambient air temperature (given the stated minimum residence time of 2.8 days), resulting (assuming a discharge at 25 °C) in effects on river water temperature less than 0.1 °C, which can be considered no more than minor.

F. SUBMISSIONS

42. I confirm I have read the submissions received on the application and provide the following commentary in response to matters related water quality or ecology raised in submissions.
43. I note the concern raised by Ngati Rangi (submission #15) about the wetland being constructed on contaminated soil, and the risk of contaminants from contaminated land being discharged into the river. I understand from Mr Blackwell's contaminated land

assessment that the wetland is to be fully lined, and that, provided the HDPE liner is correctly installed, quality assured and maintained, seepage should be near-zero and the risk of contaminants from the underlying soils entering the wetland discharge and subsequently the Whangaehu River would be low.

44. I note the concerns raised by Mr Graeme Curwen (submission #14):
- a. Mr Curwen is correct that the composition of the condensate will not be pure water. There will be a range of organic and inorganic compounds in the vapour, some of which will be destroyed via combustion. This is discussed in Ms Simpson's memo and in my evidence at paragraph 22.
 - b. Mr Curwen raises the issue of access to pH data for the Whangaehu River. I have enquired with Horizons' Science department, and it is my understanding that Horizons currently do not undertake any high-frequency ('continuous') monitoring of pH in the Whangaehu River. Such monitoring was undertaken historically at three sites (Tangiwai flood gauge, Karioi and SH49) but was discontinued at different times (e.g. 2010 for Karioi and 2024 at SH49).
45. Te Whatu Ora / Health NZ (submission #17) discuss water quality aspects, which I generally agree with, including the expectation that there should not be any microbiological water quality concerns associated with the condensate water. Any microbiological water quality contributions from wildlife associated with the wetland would be no different from that of a natural wetland and are expected to be no more than minor, particularly if the wetland is planted and open water areas are limited.

G. CONCLUSION

46. Overall, based on the assumptions made on the proposed discharge's quality and maximum daily volume and rate, I am of the opinion that:
- a. The effects of the proposed discharge on the water quality of the Whangaehu River will generally not be detectable and will be no more than minor overall;

- b. Any consequential effects on the river's living communities and ecology will also be no more than minor;
 - c. Consequently, I expect any effect of the discharge on the One Plan water quality targets or NPS-FM attribute states (bands) will be no more than minor – which in effect means that targets / bands that are met upstream of the discharge will be met downstream, and those that are not met upstream will continue not to be met, but not by any appreciably greater degree;
 - d. I also expect that the discharge will not cause exceedances of any RMA S107(1) water quality standards, specifically S107(1)(c) (films scums or foam), (d) (conspicuous change in water clarity or colour), (f) (rendering water unsuitable for farm animals) and (g) (significant adverse effects on aquatic life).
47. An important proviso is that the above conclusions are fully dependent on the assumptions made regarding the discharge's quality and quantity, which cannot be known with certainty until the plant is operational. Consequently, I recommend that monitoring of the discharge be put in place to check that the assumed discharge quality and quantity hold true once the plant is operational, including that there is no significant deterioration of the discharge's quality caused by its passage through the wetland.
48. Specifically, should the consents be granted, I recommend that:
- a. Consent condition(s) requiring continuous monitoring and regular reporting of the discharge rate. Horizons typically use conditions requiring the installation of a telemetry-capable flow meter, installed and certified to a +/- 5% accuracy.
 - b. A consent condition requiring the daily discharge volume to not exceed 750 m³/d.
 - c. Consent conditions requiring the monitoring of the discharge's chemical composition, including the constituents listed in the application, with the addition of cBOD₅ and a selection of organic compounds (VOCs, PAHs, phenol, furans). This monitoring should be regular (e.g. fortnightly) for a time following the commissioning of the plant. Depending on the results, this monitoring may shift to a "surveillance" mode, i.e.

become less intensive (e.g. monthly or less frequently, with a smaller suite of parameters).

49. Monitoring results should be compared with the “proposed” discharge quality, and any significant discrepancies should trigger an assessment of potential effects. Depending on the results of this assessment, a mechanism to ensure the nature and magnitude of effects are consistent with those described in the application will be required. Such mechanism may include, for example a requirement for gradual improvement in discharge quality and/or a reduction in maximum discharge volume. Significant discrepancies could include, for example, the average concentration of measurements taken over a period of, say, 6 months (for fortnightly sampling) or 12 months (for monthly sampling) exceeding the concentrations stated in Table 1 (or exceeding laboratory detection limits for those compounds not listed in Table 1), or any individual measurement exceeding three times the concentrations stated in Table 1 (or three times the laboratory detection limits for those compounds not listed in Table 1).
50. I have collaborated with and reviewed the conditions suggested by Ms Morton as part of the proposed condition framework. I am satisfied that the framework, provides the appropriate basis to address the matters identified in my report.

H. APPENDIX

Table 3: Summary statistics for samples collected during the five years ending in December 2024 from the Whangaeu River, upstream from the Winston Pulp mill (U/S) and at Kauangaroa (Kauang). Note: P = percentile, SD = standard deviation, CI = confidence interval, n = number of samples.

	Ammoniacal-N		Nitrate-N		DIN		TN		DRP		TP		E. coli		pH		Vis. Clarity		Turbidity	
	g/m ³		g/m ³		g/m ³		g/m ³		g/m ³		g/m ³		/100 mL				m		NTU	
	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang
Mean	0.182	0.032	0.043	0.294	0.23	0.329	0.169	0.584	0.117	0.014	0.138	0.137	2	623	3	6.1	0.36	0.19	45.9	94.4
Min	0.012	0.002	0.020	0.059	0.042	0.089	0.02	0.05	0.004	0.002	0.015	0.033	2	2	1.9	2.6	0.01	0.01	0.4	4.3
P5	0.020	0.003	0.027	0.096	0.074	0.112	0.05	0.23	0.007	0.004	0.024	0.039	2	2	1.9	2.9	0.03	0.03	0.9	6.9
P25	0.050	0.014	0.037	0.137	0.097	0.197	0.08	0.32	0.036	0.007	0.046	0.046	2	2	2.3	4.6	0.12	0.08	4.7	13.8
Median	0.128	0.027	0.045	0.23	0.18	0.271	0.11	0.48	0.089	0.011	0.091	0.064	2	87	2.6	6.9	0.26	0.15	9.5	21.8
P75	0.269	0.040	0.049	0.41	0.31	0.444	0.19	0.71	0.164	0.015	0.183	0.121	2	328	3.7	7.5	0.42	0.29	45.8	74.0
P95	0.531	0.075	0.056	0.68	0.568	0.71	0.46	1.16	0.354	0.031	0.437	0.403	2	2567	5.1	7.9	1.21	0.40	151.4	394.1
Max	0.790	0.143	0.059	0.754	0.94	0.794	0.93	2.24	0.454	0.046	0.809	1.21	4	9700	5.6	7.9	2.10	0.42	572.0	1184.0
SD	0.181	0.027	0.009	0.184	0.189	0.183	0.155	0.419	0.111	0.01	0.144	0.216	0	1662	1.0	1.7	0.42	0.13	95.4	208.3
CI95	0.047	0.007	0.002	0.048	0.049	0.047	0.04	0.109	0.029	0.002	0.037	0.056	0	443	0.3	0.4	0.13	0.05	24.8	54.1
n	57	57	57	57	57	57	57	57	57	57	57	57	57	54	57	54	40	32	57	57

Table 4: Summary statistics for samples collected between July 2004 and December 2024 from the Whangaehu River, upstream from the WPI discharge (U/S) and at Kauangaroa (Kauang). The Whangaehu at Kaungaroa site is one of Horizon's State of the Environment long-term water quality monitoring sites. It is located on the lower Whangaehu River, a considerable distance downstream of the WPI site and monitoring data summaries for this site are provided as background information only. *Note: P = percentile, SD = standard deviation, CI = confidence interval, n = number of samples.*

	Ammoniacal-N		Nitrate-N		DIN		TN		DRP		TP		E. coli		pH		Vis. Clarity		Turbidity	
	g/m ³		g/m ³		g/m ³		g/m ³		g/m ³		g/m ³		/100 mL				m		NTU	
	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang	U/S	Kauang
Mean	0.117	0.027	0.041	0.271	0.161	0.299	0.139	0.616	0.077	0.015	0.097	0.129	3	850	3.7	6.5	0.49	0.26	57	103
Min	0.003	0.002	0.003	0.005	0.017	0.017	0.01	0.05	0.003	0.001	0.003	0.016	1	1	1.7	2.6	0.01	0.01	0.4	4.1
P5	0.005	0.005	0.023	0.068	0.046	0.079	0.025	0.232	0.003	0.003	0.019	0.034	1	2	2	3.1	0.03	0.04	2	7
P25	0.029	0.007	0.034	0.121	0.075	0.154	0.07	0.33	0.013	0.007	0.03	0.048	2	39	2.4	5.6	0.12	0.10	6	16
Median	0.074	0.016	0.04	0.22	0.12	0.244	0.1	0.48	0.04	0.011	0.06	0.067	2	138	3.1	7.2	0.35	0.20	12	28
P75	0.16	0.034	0.047	0.372	0.2	0.397	0.17	0.753	0.111	0.017	0.126	0.113	2	448	4.8	7.6	0.79	0.35	38	70
P95	0.396	0.073	0.056	0.65	0.443	0.706	0.434	1.437	0.293	0.029	0.295	0.484	4	3513	6.6	7.9	1.31	0.80	195	407
Max	0.79	0.46	0.12	0.894	0.94	1.04	0.93	3.22	0.454	0.205	0.809	1.22	195	27550	7.5	8.7	2.10	1.38	3306	2570
SD	0.132	0.038	0.013	0.184	0.136	0.192	0.124	0.43	0.092	0.02	0.107	0.184	14	2502	1.5	1.6	0.45	0.23	242	260
CI95	0.018	0.005	0.002	0.026	0.019	0.026	0.017	0.061	0.013	0.003	0.015	0.026	2	348	0.2	0.2	0.07	0.04	34	36
n	202	205	183	195	203	206	201	193	202	205	201	193	201	201	200	188	154	162	201	205