Porirua Wastewater Treatment Plant

2021/2022 Annual Resource Consents Report

Control Sheet

Document Title: Porirua Wastewater Treatment Plant 2021/2022 Annual Resource Consents Report

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Executive Summary

The following report was prepared by Wellington Water on behalf of the Porirua City Council (PCC) for the Greater Wellington Regional Council (GWRC). This report includes results and observations that satisfy the reporting requirements of the following Porirua Wastewater Treatment Plant resource consents:

WGN 980083 [33805]

The Porirua WWTP is governed by the resource consent under the Greater Wellington Regional Council consent file number WGN980083. In general, the consent allows the discharge of treated and partially treated effluent from the Porirua City Council's Wastewater Treatment Plant at Rukutane Point through an existing outfall at or about map reference NZMS 260:R27;320.097.

The report will cover the annual period from July 2021 to June 2022 as requested in this resource consent.

WGN 980083 (02)

The Porirua WWTP is governed by the resource consent under the Greater Wellington Regional Council consent file number WGN980083 (02). In general, the consent allows the discharge of contaminants from the Porirua City Council's Wastewater Treatment Plant to the air at the or about map reference NZMS 260: R27;632.096.

The report will cover the annual period from July 2021 to June 2021 as requested in this resource consent.

WGN 980083 (03)

To occupy the coastal marine area with a concrete deflection wall and the outfall structures, the resource consent under the Greater Wellington Regional Council consent file number WGN980083 (03) was obtained.

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WGN980083 [33805]

Condition (10)

Before 1 October 2003, the permit holder shall sample the treated effluent at the sample point required by condition 9 and the following effluent standards shall apply.

(a) Based on daily 24 hour flow proportioned composite sampling, with a running geometric mean and 90 percentile calculated each day using 90 consecutive daily test results, the effluent shall meet the following standard:

(i) Biochemical Oxygen Demand: Geometric mean of 90 day consecutive BOD5 values shall not exceed 30g/m^3 and no more than 10% of 90 consecutive daily values shall exceed 75g/m^3.

(ii) Suspended solids: Geometric mean of 90 day consecutive daily suspended solids values shall not exceed 30g/m^3 and no more than 10% of 90 consecutive daily values shall exceed 75g/m^3.

(b) Based on no fewer than one flow proportioned 24 hour composite sample collected on a normal Monday to Friday working day on a quarterly basis, concentrations of metals and other specified compounds shall not exceed the following limits:

Arsenic	0.5g/m^3
Cadmium as the element	0.05 g/m^3
Chromium	0.2 g/m^3
Copper as the element	0.8 g/m^3
Nickel as the element	0.05 g/m^3
Lead as the element	0.5 g/m^3
Zinc as the element	2.0 g/m^3
Mercury as the element	0.002 g/m^3
Phenol	0.2 g/m^3
Cyanide as CN	0.1 g/m^3
Chlorinated hydrocarbons	0.01 g/m^3

Condition 10 is no longer enforced since the 1 October 2003 date has passed. Therefore, no reporting for this condition is required.

Condition (11)

After 1 October 2003, the permit holder shall sample the treated effluent at the sample point required by condition 9 and the following effluent standards shall apply.

(a) Based on daily 24 hour flow proportioned composite sampling, with a running geometric mean and 90 percentile calculated each day using 90 consecutive daily test results, the effluent shall meet the following standard:

(i) Biochemical Oxygen Demand: Geometric mean of 90 day consecutive BOD5 values shall not exceed 30g/m^3 and no more than 10% of 90 consecutive daily values shall exceed 75g/m^3.

(ii) Suspended Solids: Geometric mean of 90 day consecutive suspended solids values shall not exceed 30g/m^3 and no more than 10% of 90 consecutive daily values shall exceed 75g/m^3.

(b) Based on no fewer than 20 representative grab samples per month, (such samples shall be taken from the date of commencement of this permit, on separate days per month between the hours of 9am and 5pm), the effluent shall not exceed the following standard:

(i) Faecal coliform bacteria: Geometric mean of 1000 per 100 millilitres and no more than 10% of monthly samples shall exceed 2,000 per 100 millilitres.

(c) Based on no fewer than one flow proportioned 24 hour composite sample collected on a normal Monday – Friday working day on a quarterly basis, concentrations of metals and other specified compounds shall not exceed the following limits:

Arsenic	0.5g/m^3
Cadmium as the element	0.05 g/m^3
Chromium	0.2 g/m^3
Copper as the element	0.8 g/m^3
Nickel as the element	0.05 g/m^3
Lead as the element	0.5 g/m^3
Zinc as the element	2.0 g/m^3
Mercury as the element	0.002 g/m^3
Phenol	0.2 g/m^3
Cyanide as CN	0.1 g/m^3
Chlorinated hydrocarbons	0.01 g/m^3

Section (a)

Figure 1 and Figure 2 below presents a graphical summary of the geometric mean and the 90th percentile compliance for the Biological Oxygen Demand and the Suspended Solids daily analytical results.

The treatment plant was compliant to effluent BOD and suspended solids quality requirement of the consent for financial year 2021/2022.

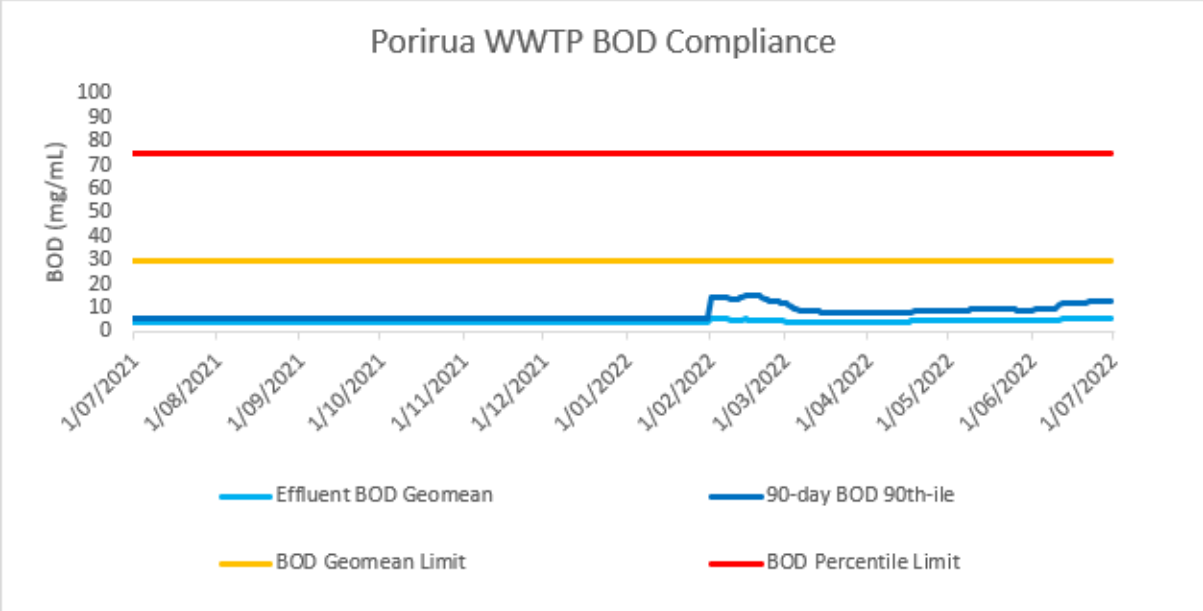


Figure 1- Effluent BOD geomean and 90th percentile data for the FY21/22.

A graphical representation of the daily effluent results can be found in Appendix i: Daily Effluent Results. The daily values can be found in quarterly reports and certificates of laboratory analysis can be provided upon request.

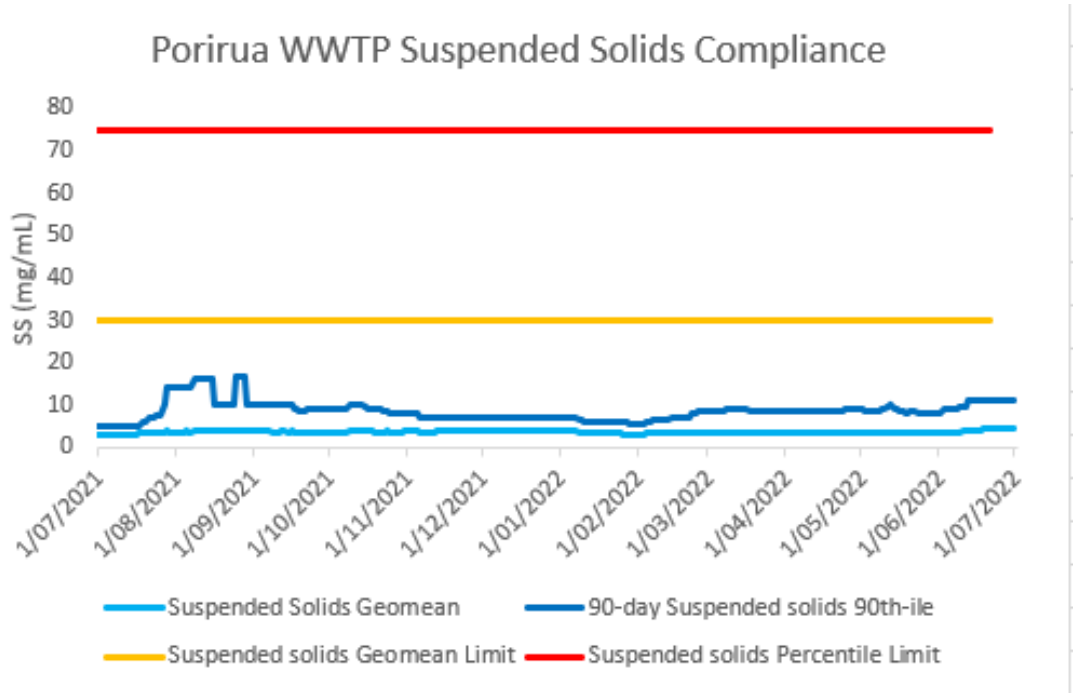


Figure 2- Effluent suspended solids geomean and 90th percentile data for the FY21/22

Section (b)

Table 2 below is a summary of the geometric mean and percent compliance for faecal coliforms analytical results.

In July 2015, an agreement with GWRC was made to use only the first 20 faecal coliform analytical results for compliance purposes.

Date	Faecal Coliforms	
	20 Sample Geometric Mean	20 Sample Percent Compliance
	cfu/100mL	%
31-Jul-21	30	90
31-Aug-21	19	95
30-Sep-21	14	100
31-Oct-21	10	100
30-Nov-21	16	100
31-Dec-21	342	80
31-Jan-22	49	100
28-Feb-22	49	90
31-Mar-22	36	100
30-Apr-22	12	100
31-May-22	12	100
30-Jun-22	34	100
Limits	**1000**	**85**

Table 1: Monthly Faecal Coliform Geometric Mean and Percent Compliance

In December 2021, the percent compliance for faecal coliform did not achieve the required percent compliance threshold.

GWRC have requested an explanation for the December 2021 effluent faecal coliform exceedance. A response was given on 26 April 2022.

In summary, the non-compliance in effluent faecal coliform was due to a combination of wet weather and a failure of the automated communication between the flow meter and the UV.

A graphical representation of the daily effluent results can be found in Appendix i: Daily Effluent Results. The daily values can be found in quarterly reports and certificates of laboratory analysis can be provided upon request.

Section (c)

Below is a summary of the quarterly metals and other specified compounds analytical results.

Compound	Units	Limit	05/07/2021	04/10/2021	25/01/2022	04/04/2022
Arsenic	**g/m³**	**0.5**	0.0011	0.0023	0.0013	0.00098
Cadmium as the element	**g/m³**	**0.05**	0.00005	0.00005	0.0005	5E-5
Chromium	**g/m³**	**0.2**	0.0013	0.0022	0.005	0.0022
Copper as the element	**g/m³**	**0.8**	0.0015	0.0018	0.002	0.0016
Nickel as the element	**g/m³**	**0.05**	0.00056	0.00076	0.001	0.00072
Lead as the element	**g/m³**	**0.5**	0.00019	0.00012	0.001	0.00015
Zinc as the element	**g/m³**	**2.0**	0.016000001	0.023	0.016000001	0.02
Mercury as the element	**g/m³**	**0.002**	5E-5	5E-5	0.0005	5E-5
Phenol	**g/m³**	**0.2**	0.002	0.01	0.004	0.002
Cyanide as CN	**g/m³**	**0.1**	0.005	0.005	0.005	0.005
Chlorinated hydrocarbons	**g/m³**	**0.01**	See note	See note	See note	See note

Table 1: Quarterly Metals and other Specified Compounds Analytical Results

Note: The Porirua WWTP Quarterly Reports contain the full analytical results of the metals and other specified compounds as well as the breakdown of the chlorinated hydrocarbons.

Condition (14)

The permit holder shall monitor the enterococci and faecal coliform contents of the receiving waters at six shoreline locations between Titahi Bay Beach and Te Korohiwa Rocks. The shoreline monitoring locations shall include the following sites:

- At or about 200 metres generally eastwards of the outfall;
- At or about 200 metres generally southwestwards of the outfall; and
- Titahi Bay Beach

In addition, the permit holder shall establish a sample control site and measure background enterococci and faecal coliform contents of the coastal waters. All sampling locations shall be to the satisfaction of the Manager, Consents management, Wellington Regional Council.

Please note that the original control site posed a health and safety issue for the technician when collecting the sample. A meeting was held with GWRC on site 29th August 2020 regarding the relocation of the control site sampling location. GWRC agreed to the new sample location via e-mail on 12th September 2020 so the new control site is at the end of Whitireia Road. The following is a list of the seven sampling points and a map of their locations:

Sampling Point 1 - Te Korohiwa Rocks
Sampling Point 2 - West of Outfall
Sampling Point 3 - East of Outfall
Sampling Point 4 - Titahi Bay Beach South
Sampling Point 5 - Titahi Bay Beach
Sampling Point 6 - Mount Cooper
Control Point - Whitireia Park.

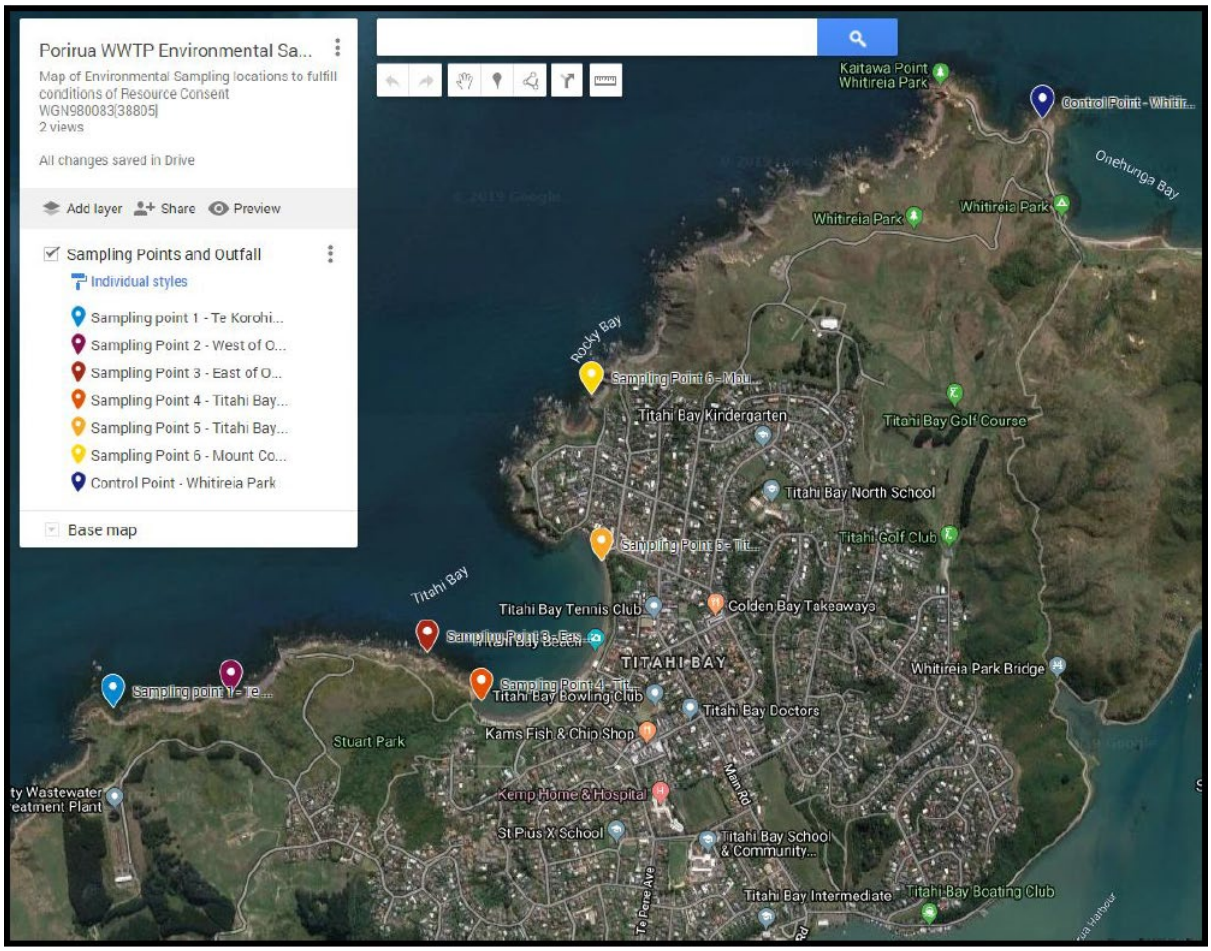


Figure 3: Shoreline Monitoring Sampling Sites

Condition (15)

The water at all sampling locations required by condition 14 shall be monitored for enterococci and faecal coliforms ~~at least three~~ monthly. ~~Between 1 April and 30 September and monthly between 1 October and 31 march, until such time as any new disinfection plant is commissioned. For the first 12 months after commissioning such monitoring shall be carried out on at least a monthly basis. Thereafter, the monitoring may be at such reduced intensity as determined by the Manager, Consents Management, Wellington Regional Council.~~

In the event of a discharge of partly or untreated sewage effluent due to either plant malfunction, or *plant overflow*, or *plant bypass*, the above said waters shall further be monitored at or about 24 hours, 72 hours, and 144 hours after that discharge commenced.

For each water sample required by this condition, the permit holder shall make record of the date, time, weather, wind and tidal conditions at its sampling location. These records for each preceding quarter shall be supplied to the Manager, Consents Management, Wellington Regional Council, in the quarterly monitoring report required by condition 17.

Shoreline samples are collected from all the sampling locations mentioned in Condition (14) during bypass or overflow events 24 hours, 72 hours, 144 hours after the discharge. If there has not been a discharge event during the month period, samples are collected from all sampling locations at the end of the month to comply with Condition (15).

Below is a summary of the bypass and overflow events that have occurred each month during this reporting quarter. The breakdown for each month and explanation of the events can be found in Condition (21). The results from each set of samples collected can be found in Appendix ii: Shoreline Monitoring Data. Analytical results from each set of samples collected can be made available upon request.

Month	Bypass/Overflow Events	
	Consented	Non-Consented
July 2021	2	0
August 2021	2	1
September 2021	0	0
October 2021	1	0
November 2021	0	0
December 2021	2	0
January 2022	0	0
February 2022	2	0
March 2022	0	0
April 2022	0	0
May 2022	0	0
June 2022	1	0

Table 2: Monthly Bypass and Overflow Events

Condition (18)

Notwithstanding any enforcement action Wellington Regional Council may choose to take, should the criteria set out in conditions 10 or 11 be exceeded or breached, or the effects in condition 13 (a) – (c) be caused by the discharge, the permit holder shall undertake the following:

(a) Immediately notify the Manager, Consents Management, Wellington Regional Council.

(b) Immediately investigate the reason why the criteria was exceeded.

(c) Immediately identify and undertake whatever appropriate remedial action to the satisfaction of the Manager, Consents Management, Wellington Regional Council, to mitigate the effects.

(d) Forward within five working days to the Manager, Consents Management, Wellington Regional Council, a report on the steps taken to ensure that the criteria are not breached in the future.

Notifications were sent to regional council if there were breaches in the consent except for the 19th of August 2021 incident.

GWRC had requested an explanation in relation to non-compliances at Porirua Wastewater Treatment Plant on 9 March 2022. Wellington Water had provided the response on 26 April 2022.

The following non-compliance notices were given to Wellington Water during the financial year 2021/22.

Month Issued	Facility	Non-compliance Notice	Description
August 2021	Porirua WWTP	Abatement Notice A961	Release of undisinfected effluent on 21 Jan 2021 due to power surge and also on 22-23 March 2021 due to human error. The notice requires that the abatement notice be complied with and the UV upgrade project be completed by 30 Sep 2021.
October 2021	Porirua WWTP	Formal Warning	Effluent quality non-compliance to faecal coliform limits last October and December 2020.

Table 3: Non-compliance Notices

Condition (21)

In the event of a plant malfunction or the discharge of untreated or partially treated effluent, the permit holder shall: • Immediately notify both the Manager, Consents Management, Wellington Regional Council, and the Public Health Service. • If required by Manager, Consents Management, Wellington regional Council, provide within 48 hours a written report to the Manager, detailing manner and cause of the malfunction and the nature of the released effluent, and the steps taken (and being taken if appropriate) to remedy and control that discharge, and to prevent any such releases of untreated or partially treated effluent.

Table 6 summarises the bypass and/or overflow events for the July 2021 to June 2022 reporting year. We had 10 bypass discharges during this reporting period, and one sludge carryover event on 19th August 2021.

Notifications were submitted to GWRC for all discharges except for the 19th of August 2021 event. The explanation for this incident was detailed on the response letter given to GWRC on 26th April 2022.

Start (Date + Time)	Finish (Date + Time)	Duration	Volume Treated During Bypass	Total Volume of Bypass	Consented	Cause
		hrs/mins	m^3	m^3	Y/N	
17/07/21 5:35	19/07/21 4:28	46 h 53 min	143,205	10,453	Y	Wet Weather
22/07/21 7:28	23:07/21 1:52	18h 24 min	53,558	2,567	Y	Wet Weather
08/08/21 12:40	09/08/21 4:40	16h 19 min	53,352	3,666	Y	Wet Weather
19/08/21	-	-		-	N	Sludge carry over
28/08/21 8:22	28/08/2021 14:47	6h 25 min	20,431	790	Y	Wet Weather
12/10/21 3:44	12/10/21 3:45	0h 1 min	103	0.2	Y	Wet Weather
06/12/21 7:39	08/12/2021 0:20	40h 41 min	135,998	1,999	Y	Wet Weather
16/12/21 11:38	16/12/21 13:21	01h 43 min	5,759	149	Y	Wet Weather
5/02/22 4:05	6/02/22 18:41	38h 36 min	128,884	109	Y	Wet Weather
12/02/22 15:59	14/02/22 14:22	46 h 23 min	159,461	6,823	Y	Wet Weather
09/06/22 4:55	09/06/22 16:30	11h 35 min	40,425	5,009	Y	Wet Weather

Table 4: Bypass and Overflow Events

Condition (23)

The permit holder shall take all reasonable steps to investigate and implement ways and means of minimizing infiltration and stormwater ingress into the sewerage system and provide the Manager, Consents Management, Wellington Regional Council with an annual progress report.

An inflow and infiltration report can be found in appendix iii.

Condition (24)

Within nine months of the commencement of the permit, the permit holder shall establish a community liaison group. That community liaison group should include representatives of the Titahi Bay Residents and Ratepayers Progressive Assn Inc, Regional Public Health, the community as determined by the risk communication strategy, and the permit holder. Nothing in this condition shall be interpreted as requiring any member of the community liaison group to attend any or all of the group's meetings. The permit holder shall report in writing to the Manager, Consents Management, Wellington Regional Council, annually as to the consultation activities undertaken. A copy of the report shall be forwarded by the permit holder to each member of the community liaison group.

A Community Liaison Group was established with representatives of the Titahi Bay Residents and Ratepayers Progressive Assn Inc, Regional Public Health, the community as determined by the risk communication strategy, and the permit holder.

A community liaison group meeting was held on 23rd November 2021.

A webinar was held on 11th November 2021 to discuss the clarifier sludge carry over issue.

WGN980083 (02)

Condition (8)

If required by the Manager, Consents Management, Wellington Regional Council, the permit holder shall carry out monitoring of air-borne pathogens to demonstrate compliance with condition 6 or 7. The ,monitoring shall be undertaken at six monthly intervals and the results forwarded to the Manager, Consents Management, Wellington Regional Council within one moth of each survey being conducted. The location of the sample site shall be mutually agreed by the permit holder and the Manager, Consents Management, Wellington Regional Council. The survey s shall be carried out by a standard method to the satisfaction of the Manager, Consents Management, Wellington Regional Council.

The Manager, Consents Management, Wellington Regional Council has not requested these surveys be performed.

Condition (9)

The permit holder shall keep a record of any complaints received. The complaints will be forwarded to the Manager, Consents Management, Wellington Regional Council, within twenty-four hours of the complaint being received by the permit holder. The permit holder shall endeavor to record the complainant's name, time of the incident, wind direction and speed, as well as the plant operating conditions at the time of the complaint.

The table below shows the complaints received for FY21/22.

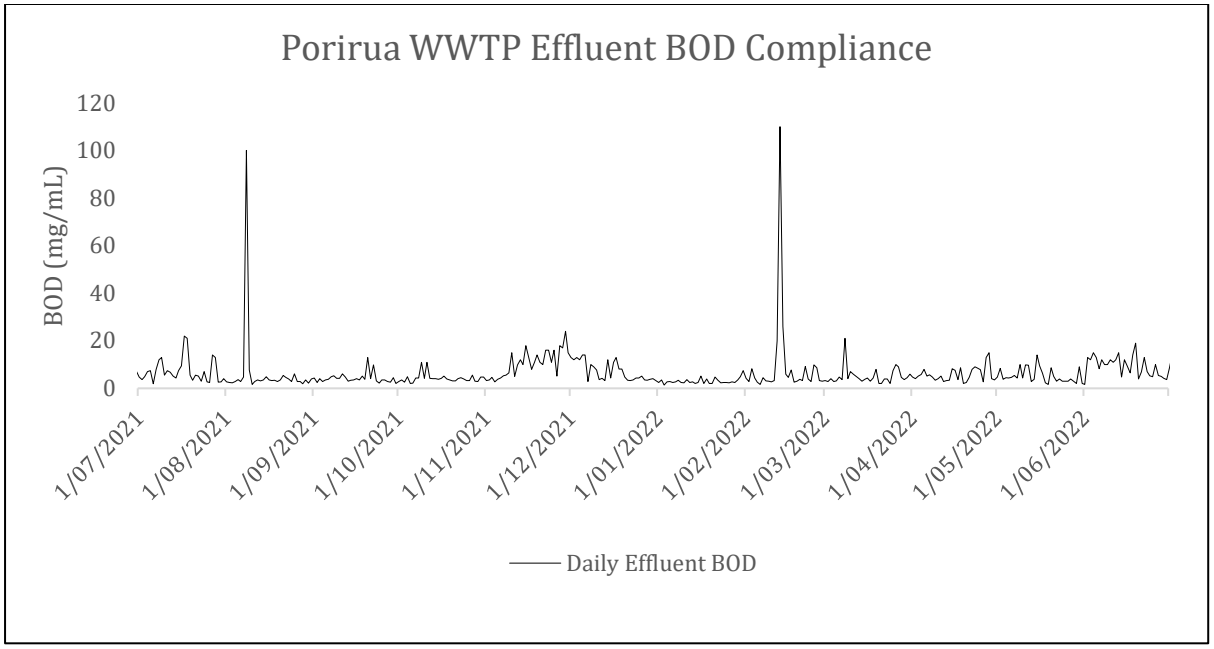
Date and time:	Incident Description	Wind direction:	Windspeed:	Notes
16/04/22 10:02	the smell today was disgusting it was a beautiful hot day and we couldn't have our windows open it stunk of raw sewage we brought this section for a high price with stringent rules around the smell. I'm really starting to get angry it's not rocket science to work out there's an odour problem so what's been done about it. It's about time there was some action and not talk	Northerly	Strong	Normal, no unusual odours detected by operator except usual farm smells. Centrifuges were not running, no bins were produced that day
2/05/2022 8:07 pm	Porirua WWTP complaint stating: Good evening I am emailing to tell you that this evening the smell of sewerage was unbearable even know the wind was blowing about 50km per hour from the norwest.this is getting to be ridiculous this is starting to happen more often and it's unacceptable I'd say since we haven't had a strong northerly for a while the plant will be pumping sewarage out to mix up in rough ocean to disguise it we are only one family living here the neighbours will be moving in in one week so this will be a problem no doubt they will smell it too.			Complaint was received on 3/05/2022 7:32 pm from a consultant. Forwarded to Veolia for investigation on 4/05/2022 9:50 am. Please note that this complaint did not go to proper channel, so investigation was not made immediately.
3/05/2022 7:32 pm	The smell was bad again today right up at the house what is your response or are you not the right person to talk to?			Complaint was received on 3/05/2022 7:32 pm from a consultant. Forwarded to Veolia for investigation on 4/05/2022 9:50 am. Please note that this complaint did not go to proper channel, so investigation was not made immediately.

Table 4: Complaints Received FY21/22

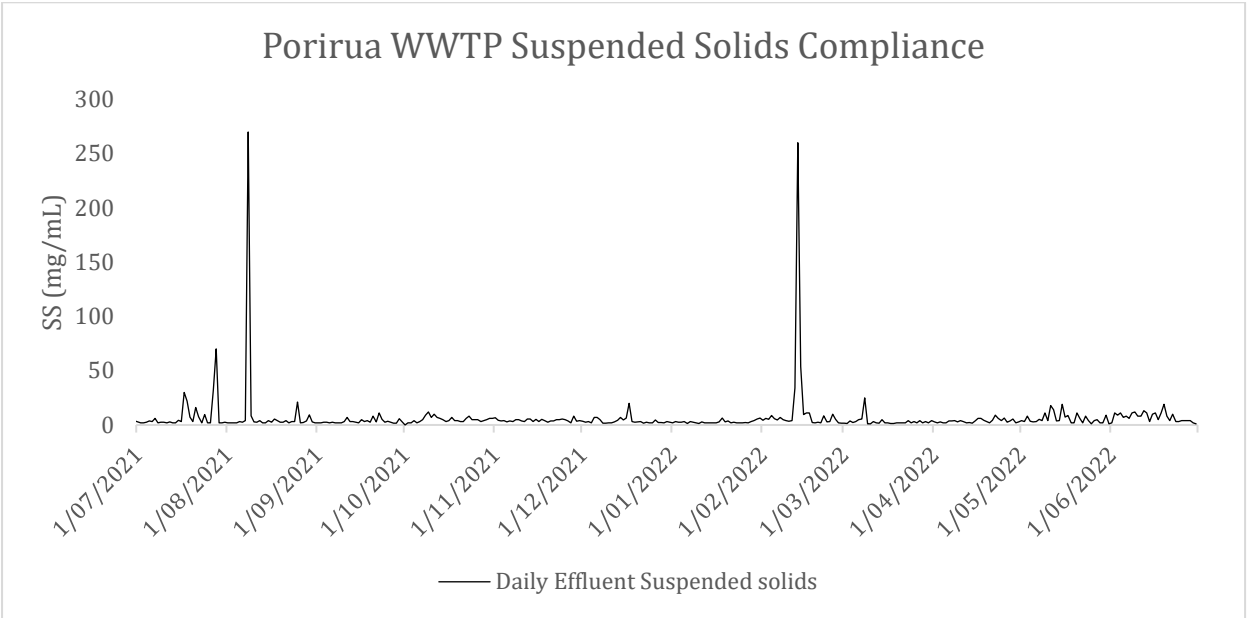
Appendix i

Daily Effluent Quality Results

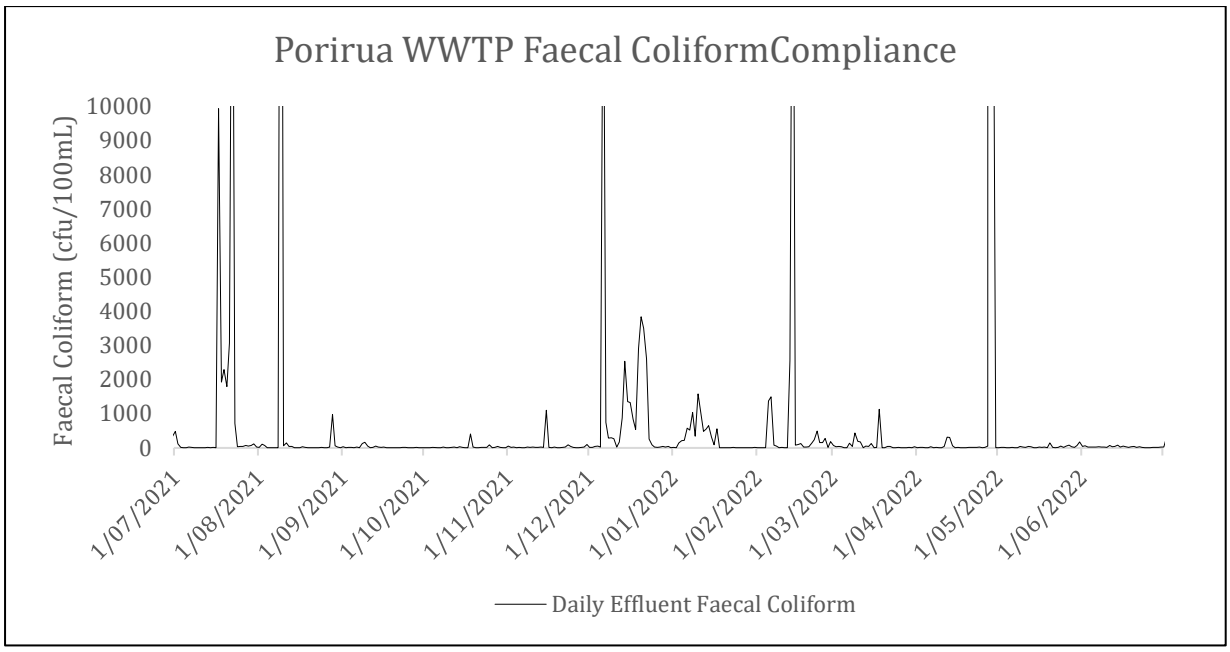
Effluent BOD Results



Effluent Suspended Solid Results



Effluent Faecal Coliforms Results



Appendix ii

Shoreline Monitoring Results

Shoreline Monitoring Data

	Te Korohiwa Rocks								200m South West of Outfall								200m East of Outfall								South End Titahi Bay							
Date	Enterococci	Faecal Coliforms	Wind Direction	Wind strength	Tide	Sea conditions	WWTP Bypass/ Overflow Event	Possible Source (if out of spec)	Enterococci	Faecal Coliforms	Wind Direction	Wind strength	Tide	Sea conditions	WWTP Bypass/ Overflow Event	Possible Sources (if out of spec)	Enterococci	Faecal Coliforms	Wind Direction	Wind strength	Tide	Sea conditions	WWTP Bypass/ Overflow Event	Possible Sources (if out of spec)	Enterococci	Faecal Coliforms	Wind Direction	Wind strength	Tide	Sea conditions	WWTP Bypass/ Overflow Event	Possible Sources (if out of spec)
dd/mm/yyyy	cfu/100mL	cfu/100mL	--	--	--	--	Y/N	--	cfu/100mL	cfu/100ml	--	--	--	--	Y/N	--	cfu/100mL	cfu/100ml	--	--	--	--	Y/N	--	cfu/100mL	cfu/100ml	--	--	--	--	Y/N	--
19/07/2021	6	9	S	Light	Mid	Flood	Y - 72hr	N/A	18	2	S	Light	Mid	Flood	Y - 72hr	N/A	6	2	S	Light	Mid	Flood	Y - 72hr	N/A	9	6	S	Light	Mid	Flood	Y - 72hr	N/A
21/07/2021	2	2	N	Light	Low	Flood	Y - 144hr	N/A	18	84	N	Light	Low	Flood	Y - 144hr	N/A	6	6	N	Light	Low	Flood	Y - 144hr	N/A	2	2	N	Light	Low	Flood	Y - 144hr	N/A
23/07/2021	2	2	S	Light	Low	Ebb	Y - 24hr	N/A	18	8	S	Light	Low	Ebb	Y - 24hr	N/A	34	28	S	Light	Low	Ebb	Y - 24hr	N/A	14	18	S	Light	Low	Ebb	Y - 24hr	N/A
25/07/2021	2	2	S	Light	Low	Flood	Y - 72hr	N/A	2	4	S	Light	Low	Flood	Y - 72hr	N/A	2	2	S	Light	Low	Flood	Y - 72hr	N/A	6	4	S	Light	Low	Flood	Y - 72hr	N/A
28/07/2021	6	2	S	Light	Low	Ebb	Y - 144hr	N/A	2	8	S	Light	Low	Ebb	Y - 144hr	N/A	2	2	S	Light	Low	Ebb	Y - 144hr	N/A	2	2	S	Light	Low	Ebb	Y - 144hr	N/A
30/07/2021	2	4	NW	Light	Low	Ebb	N	N/A	2	4	NW	Light	Low	Ebb	N	N/A	2	6	NW	Light	Low	Ebb	N	N/A	2	2	NW	Light	Low	Ebb	N	N/A
8/08/2021	60	110	S	Moderate	Low	Flood	Y - 24hr	N/A	86	170	S	Moderate	Low	Flood	Y - 24hr	N/A	68	98	S	Moderate	Low	Flood	Y - 24hr	N/A	80	130	S	Moderate	Low	Flood	Y - 24hr	N/A
10/08/2021	14	10	NW	Light	Low	Ebb	Y - 72hr	N/A	24	20	NW	Light	Low	Ebb	Y - 72hr	N/A	16	32	NW	Light	Low	Ebb	Y - 72hr	N/A	20	36	NW	Light	Low	Ebb	Y - 72hr	N/A
14/08/2021	54	38	SE	Light	Low	Ebb	Y - 144hr	N/A	2	2	SE	Light	Low	Ebb	Y - 144hr	N/A	56	20	SE	Light	Low	Ebb	Y - 144hr	N/A	12	14	SE	Light	Low	Ebb	Y - 144hr	N/A
25/08/2021	2	14	N	Light	Low	Ebb	N	N/A	2	14	N	Light	Low	Ebb	N	N/A	2	2	N	Light	Low	Ebb	N	N/A	6	8	N	Light	Low	Ebb	N	N/A
28/08/2021	2	2	NW	Moderate	Low	Ebb	Y - 24hr	N/A	2	10	NW	Moderate	Low	Ebb	Y - 24hr	N/A	2	2	NW	Moderate	Low	Ebb	Y - 24hr	N/A	12	2	NW	Moderate	Low	Ebb	Y - 24hr	N/A
30/08/2021	2	8	N	Moderate	Mid	Ebb	Y - 72hr	N/A	2	10	N	Moderate	Mid	Ebb	Y - 72hr	N/A	2	16	N	Moderate	Mid	Ebb	Y - 72hr	N/A	80	250	N	Moderate	Mid	Ebb	Y - 72hr	N/A
2/09/2021	2	2	NE	Light	High	Ebb	Y - 144hr	N/A	2	2	NE	Light	High	Ebb	Y - 144hr	N/A	2	2	NE	Light	High	Ebb	Y - 144hr	N/A	2	2	NE	Light	High	Ebb	Y - 144hr	N/A
12/09/2021	2	2	N	Light	Low	Ebb	N	N/A	2	2	N	Light	Low	Ebb	N	N/A	2	2	N	Light	Low	Ebb	N	N/A	18	8	N	Light	Low	Ebb	N	N/A
28/10/2021	2	2	S	Light	Low	Ebb	N	N/A	2	7	S	Light	Low	Ebb	N	N/A	2	4	S	Light	Low	Ebb	N	N/A	2	7	S	Light	Low	Ebb	N	N/A
24/11/2021	2	2	N	Moderate	Low	Ebb	N	N/A	2	110	N	Moderate	Low	Ebb	N	N/A	7	2	N	Moderate	Low	Ebb	N	N/A	2	110	N	Moderate	Low	Ebb	N	N/A
6/12/2021	420	88	S	Moderate	Low	Flood	Y - 24hr	Unknown	1900	1700	S	Moderate	Low	Flood	Y - 24hr	WWTP	120	52	S	Moderate	Low	Flood	Y - 24hr	N/A	400	620	S	Moderate	Low	Flood	Y - 24hr	Unknown
8/12/2021	2	2	N	Moderate	Low	Flood	Y - 72hr	N/A	4	11	N	Moderate	Low	Flood	Y - 72hr	N/A	2	4	N	Moderate	Low	Flood	Y - 72hr	N/A	2	2	N	Moderate	Low	Flood	Y - 72hr	N/A
11/12/2021	16	6	N	Moderate	Low	Ebb	Y - 144hr	N/A	2	2	N	Moderate	Low	Ebb	Y - 144hr	N/A	4	4	N	Moderate	Low	Ebb	Y - 144hr	N/A	6	18	N	Moderate	Low	Ebb	Y - 144hr	N/A
20/12/2021	2	2	N	Moderate	Low	Flood	N	N/A	6	6	N	Moderate	Low	Flood	N	N/A	2	2	N	Moderate	Low	Flood	N	N/A	4	2	N	Moderate	Low	Flood	N	N/A
22/01/2022	2	2	N	Light	Clear	Ebb	Y - 24hr	N/A	210	760	N	Light	Clear	Ebb	Y - 24hr	N/A	2	6	N	Light	Clear	Ebb	Y - 24hr	N/A	210	1300	N	Light	Clear	Ebb	Y - 24hr	N/A
5/02/2022	12	14	S	Moderate	High	Ebb	Y - 24hr	N/A	45	63	S	Moderate	High	Ebb	Y - 24hr	N/A	45	54	S	Moderate	High	Ebb	Y - 24hr	N/A	4	27	S	Moderate	High	Ebb	Y - 24hr	N/A
7/02/2022	14	98	S	Moderate	High	Ebb	Y - 72hr	N/A	94	10	S	Moderate	High	Ebb	Y - 72hr	N/A	72	4	S	Moderate	High	Ebb	Y - 72hr	N/A	6	6	S	Moderate	High	Ebb	Y - 72hr	N/A
10/02/2022	10	2	N	Light	Mid	Ebb	Y - 144hr	N/A	20	110	N	Light	Mid	Ebb	Y - 144hr	N/A	34	110	N	Light	Mid	Ebb	Y - 144hr	N/A	6	14	N	Light	Mid	Ebb	Y - 144hr	N/A
12/02/2022	6500	2000	S	Moderate	Mid	Flood	Y - 24hr	Unknown	5900	3500	S	Moderate	Mid	Flood	Y - 24hr	Unknown	120	180	S	Moderate	Mid	Flood	Y - 24hr	N/A	560	260	S	Moderate	Mid	Flood	Y - 24hr	Unknown
14/02/2022	460	540	S	Moderate	Low	Flood	Y - 72hr	Unknown	29	130	S	Moderate	Low	Flood	Y - 72hr	N/A	24	48	S	Moderate	Low	Flood	Y - 72hr	N/A	120	190	S	Moderate	Low	Flood	Y - 72hr	N/A
17/02/2022	2	2	SE	Light	Low	Flood	Y - 144hr	N/A	2	2	SE	Light	Low	Flood	Y - 144hr	N/A	2	6	SE	Light	Low	Flood	Y - 144hr	N/A	370	100	SE	Light	Low	Flood	Y - 144hr	N/A
17/02/2022	2	2	SE	Light	Low	Flood	N	N/A	8	2	SE	Light	Low	Flood	N	N/A	4	2	SE	Light	Low	Flood	N	N/A	350	130	SE	Light	Low	Flood	N	N/A
9/06/2022	160.0	31	NW	Moderate	Low	Ebb	Y - 24hr		38	18	NW	Moderate	Low	Ebb	Y - 24hr		130	25	NW	Moderate	Low	Ebb	Y - 24hr		2200	1300	NW	Moderate	Low	Ebb	Y - 24hr	
11/06/2022	74.0	58	N	Moderate	Mid	Ebb	Y - 72hr		88	52	N	Moderate	Mid	Ebb	Y - 72hr		110	62	N	Moderate	Mid	Ebb	Y - 72hr		360	140	N	Moderate	Mid	Ebb	Y - 72hr	
14/06/2022	2.0	8	NE	Light	High	Ebb	Y - 144hr		34	18	NE	Light	High	Ebb	Y - 144hr		22	30	NE	Light	High	Ebb	Y - 144hr		130	32	NE	Light	High	Ebb	Y - 144hr	
19/07/2021	6	9	S	Light	Mid	Flood	Y - 72hr	N/A	18	2	S	Light	Mid	Flood	Y - 72hr	N/A	6	2	S	Light	Mid	Flood	Y - 72hr	N/A	9	6	S	Light	Mid	Flood	Y - 72hr	N/A

	Titahi Bay Beach								Mount Cooper								Control							
Date	Enterococci	Faecal Coliforms	Wind Direction	Wind strength	Tide	Sea conditions	WWTP Bypass/ Overflow Event	Possible Source (if out of spec)	Enterococci	Faecal Coliforms	Wind Direction	Wind strength	Tide	Sea conditions	WWTP Bypass/ Overflow Event	Possible Sources (if out of spec)	Enterococci	Faecal Coliforms	Wind Direction	Wind strength	Tide	Sea conditions	WWTP Bypass/ Overflow Event	Possible Sources (if out of spec)
dd/mm/yyyy	cfu/100mL	cfu/100ml	--	--	--	--	Y/N	--	cfu/100mL	cfu/100ml	--	--	--	--	Y/N	--	cfu/100mL	cfu/100ml	--	--	--	--	Y/N	--
19/07/2021	11	6	S	Light	Mid	Flood	Y - 72hr	N/A	6	6	S	Light	Mid	Flood	Y - 72hr	N/A	6	22	S	Light	Mid	Flood	Y - 72hr	N/A
21/07/2021	38	64	N	Light	Low	Flood	Y - 144hr	N/A	2	2	N	Light	Low	Flood	Y - 144hr	N/A	2	2	N	Light	Low	Flood	Y - 144hr	N/A
23/07/2021	18	190	S	Light	Low	Ebb	Y - 24hr	N/A	16	8	S	Light	Low	Ebb	Y - 24hr	N/A	2	2	S	Light	Low	Ebb	Y - 24hr	N/A
25/07/2021	2	2	S	Light	Low	Flood	Y - 72hr	N/A	2	2	S	Light	Low	Flood	Y - 72hr	N/A	2	2	S	Light	Low	Flood	Y - 72hr	N/A
28/07/2021	2	16	S	Light	Low	Ebb	Y - 144hr	N/A	2	2	S	Light	Low	Ebb	Y - 144hr	N/A	2	4	S	Light	Low	Ebb	Y - 144hr	N/A
30/07/2021	4	4	NW	Light	Low	Ebb	N	N/A	2	6	NW	Light	Low	Ebb	N	N/A	2	2	NW	Light	Low	Ebb	N	N/A
8/08/2021	76	150	S	Moderate	Low	Flood	Y - 24hr	N/A	78	110	S	Moderate	Low	Flood	Y - 24hr	N/A	96	140	S	Moderate	Low	Flood	Y - 24hr	N/A
10/08/2021	26	36	NW	Light	Low	Ebb	Y - 72hr	N/A	10	24	NW	Light	Low	Ebb	Y - 72hr	N/A	12	24	NW	Light	Low	Ebb	Y - 72hr	N/A
14/08/2021	14	22	SE	Light	Low	Ebb	Y - 144hr	N/A	56	28	SE	Light	Low	Ebb	Y - 144hr	N/A	2	2	SE	Light	Low	Ebb	Y - 144hr	N/A
25/08/2021	2	4	N	Light	Low	Ebb	N	N/A	2	2	N	Light	Low	Ebb	N	N/A								
28/08/2021	2	4	NW	Moderate	Low	Ebb	Y - 24hr	N/A	2	2	NW	Moderate	Low	Ebb	Y - 24hr	N/A								
30/08/2021	30	30	N	Moderate	Mid	Ebb	Y - 72hr	N/A	2	6	N	Moderate	Mid	Ebb	Y - 72hr	N/A								
2/09/2021	2	2	NE	Light	High	Ebb	Y - 144hr	N/A	2	2	NE	Light	High	Ebb	Y - 144hr	N/A	2	2	NE	Light	High	Ebb	Y - 144hr	N/A
12/09/2021	12	6	N	Light	Low	Ebb	N	N/A	2	2	N	Light	Low	Ebb	N	N/A	2	2	N	Light	Low	Ebb	N	N/A
28/10/2021	2	2	S	Light	Low	Ebb	N	N/A	2	2	S	Light	Low	Ebb	N	N/A	2	2	S	Light	Low	Ebb	N	N/A
24/11/2021	2	2	N	Moderate	Low	Ebb	N	N/A	2	2	N	Moderate	Low	Ebb	N	N/A	2	2	N	Moderate	Low	Ebb	N	N/A
6/12/2021	52	80	S	Moderate	Low	Flood	Y - 24hr	N/A	120	31	S	Moderate	Low	Flood	Y - 24hr	N/A	540	80	S	Moderate	Low	Flood	Y - 24hr	Unknnown
8/12/2021	27	22	N	Moderate	Low	Flood	Y - 72hr	N/A	2	2	N	Moderate	Low	Flood	Y - 72hr	N/A	2	4	N	Moderate	Low	Flood	Y - 72hr	N/A
11/12/2021	12	24	N	Moderate	Low	Ebb	Y - 144hr	N/A	6	10	N	Moderate	Low	Ebb	Y - 144hr	N/A	2	2	N	Moderate	Low	Ebb	Y - 144hr	N/A
20/12/2021	2	2	N	Moderate	Low	Flood	N	N/A	4	2	N	Moderate	Low	Flood	N	N/A	2	4	N	Moderate	Low	Flood	N	N/A
22/01/2022	4	4	N	Light	Clear	Ebb	Y - 24hr	N/A	2	2	N	Light	Clear	Ebb	Y - 24hr	N/A	2	6	N	Light	Clear	Ebb	Y - 24hr	N/A
5/02/2022	1000	590	S	Moderate	High	Ebb	Y - 24hr	N/A	640	370	S	Moderate	High	Ebb	Y - 24hr	Unknown	18	10	S	Moderate	High	Ebb	Y - 24hr	N/A
7/02/2022	7	18	S	Moderate	High	Ebb	Y - 72hr	N/A	64	100	S	Moderate	High	Ebb	Y - 72hr	N/A	68	8	S	Moderate	High	Ebb	Y - 72hr	N/A
10/02/2022	10	14	N	Light	Mid	Ebb	Y - 144hr	N/A	16	94	N	Light	Mid	Ebb	Y - 144hr	N/A	2	2	N	Light	Mid	Ebb	Y - 144hr	N/A
12/02/2022	460	260	S	Moderate	Mid	Flood	Y - 24hr	N/A	4700	2300	S	Moderate	Mid	Flood	Y - 24hr	Unknown	7900	3200	S	Moderate	Mid	Flood	Y - 24hr	Unknown
14/02/2022	82	520	S	Moderate	Low	Flood	Y - 72hr	N/A	29	88	S	Moderate	Low	Flood	Y - 72hr	N/A	460	460	S	Moderate	Low	Flood	Y - 72hr	Unknown
17/02/2022	50	10	SE	Light	Low	Flood	Y - 144hr	N/A	8	76	SE	Light	Low	Flood	Y - 144hr	N/A	6	96	SE	Light	Low	Flood	Y - 144hr	N/A
17/02/2022	28	20	SE	Light	Low	Flood	N	N/A	6	70	SE	Light	Low	Flood	N	N/A	2	100	SE	Light	Low	Flood	N	N/A
9/06/2022	170	86	NW	Moderate	Low	Ebb	Y - 24hr		64	54	NW	Moderate	Low	Ebb	Y - 24hr		86	100	S	Moderate	Low	Flood	Y - 24hr	
11/06/2022	14	22	N	Moderate	Mid	Ebb	Y - 72hr		260	88	N	Moderate	Mid	Ebb	Y - 72hr		68	50	NW	Light	Low	Ebb	Y - 72hr	
14/06/2022	30	26	NE	Light	High	Ebb	Y - 144hr		68	20	NE	Light	High	Ebb	Y - 144hr		66	12	SE	Light	Low	Ebb	Y - 144hr	

Appendix iii

Inflow and Infiltration Report

Condition (23)

> The permit holder shall take all reasonable steps to investigate and implement ways and means of minimizing infiltration and stormwater ingress into the sewerage system and provide the Manager, Consents Management, Wellington Regional Council with an annual progress report.

Inflow and Infiltration Report

A variety of mitigation measures have been undertaken to reduce Inflow and Infiltration (I&I) and to contain wastewater within the reticulated wastewater network. This work aims to reduce the demand on the Porirua Wastewater Treatment Plant (WWTP) and to improve waterway health.

Inflow Surveys

Inflow Survey work has been undertaken in the Porirua WWTP Catchment in various sub-catchments, the progress as at June 2022 of the works is shown in Figure 1 below.

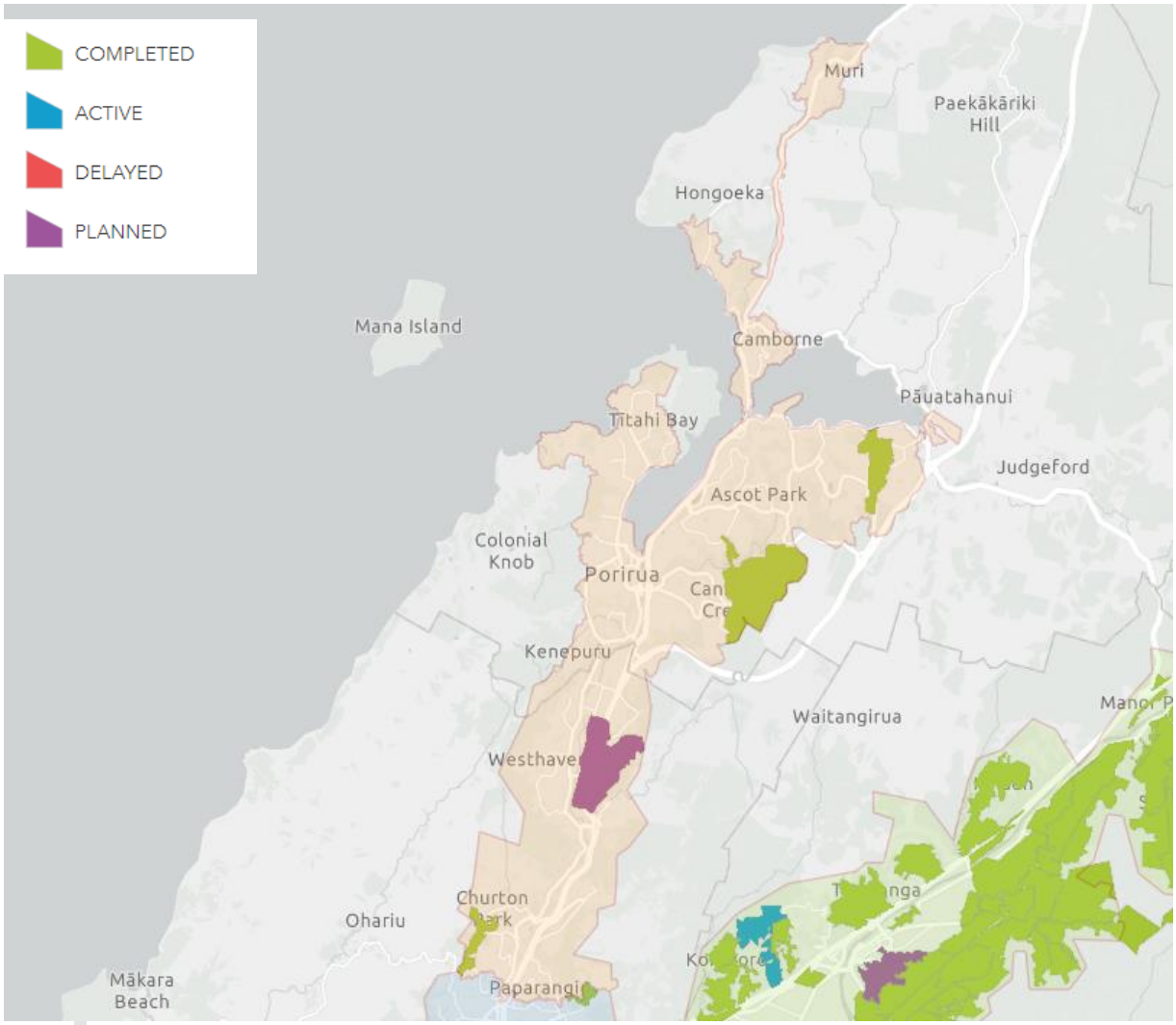


Figure 1 - Inflow Survey Project Locations for Porirua WWTP Catchment

The Churton Park Inflow Survey was completed in December 2020, with a total of 39 drainage faults resolved and seven faults outstanding at the end of the project. The Churton Park catchment is located within the Wellington City Council (WCC) boundary but drains to the Porirua WWTP.

The Duck Creek/Whitby Inflow Survey commenced in June 2020 and will be completed by July 2022. This project was temporarily put on hold in 2021 to enable funding of a Human Health Mitigation Plan Project. Some public faults and major private faults such as cross connections were addressed in 2020-2021 financial year. This catchment is shown in green in Figure 1 above as completion is due in July 2022.

The Tawa Catchment was previously smoke tested in 2017, however phase two of the project (liaison with customers and follow up inspections) were not completed. Tawa is planned for completion in the 2022-2023 financial year. This area is shown in purple in Figure 1 above of this report.

The investigations completed by the Wellington Water Drainage Investigation Team in the 2021-2022 financial year included smoke testing, dye testing and CCTV inspections for both wastewater and stormwater assets. The investigations were able to identify private and public faults. The inspections completed in the Porirua WWTP Catchment area are listed below:

- Titahi Bay at South Beach Access (smoke/dye: 109 assets, CCTV: 109 assets)
- Semple Street (smoke/dye: 50 assets, CCTV: 137 assets)
- Bothamley Park (smoke/dye: 12 assets, CCTV: 12 assets)

Flow Monitoring and Rain Gauge Monitoring

The active monitoring sites within the Porirua WWTP Catchment consist of There are nine flow, five overflow and one site that is both flow and overflow. There are also two WCC sites that are in the Porirua WWTP Catchment One monitoring site is located along Porirua City Council (PCC) and WCC boundary, these two sites provide long term records for the WCC flow contributions to Porirua WWTP. The monitoring sites are part of the long-term monitoring contract that is ongoing each year. This data is used to understand network performance and the extent of inflow and infiltration in various catchments. This data also enables investigation of network issues and maintenance of hydraulic models. These monitoring sites are shown below in Figure 2. There are also wastewater monitoring sites located at wastewater pump stations.

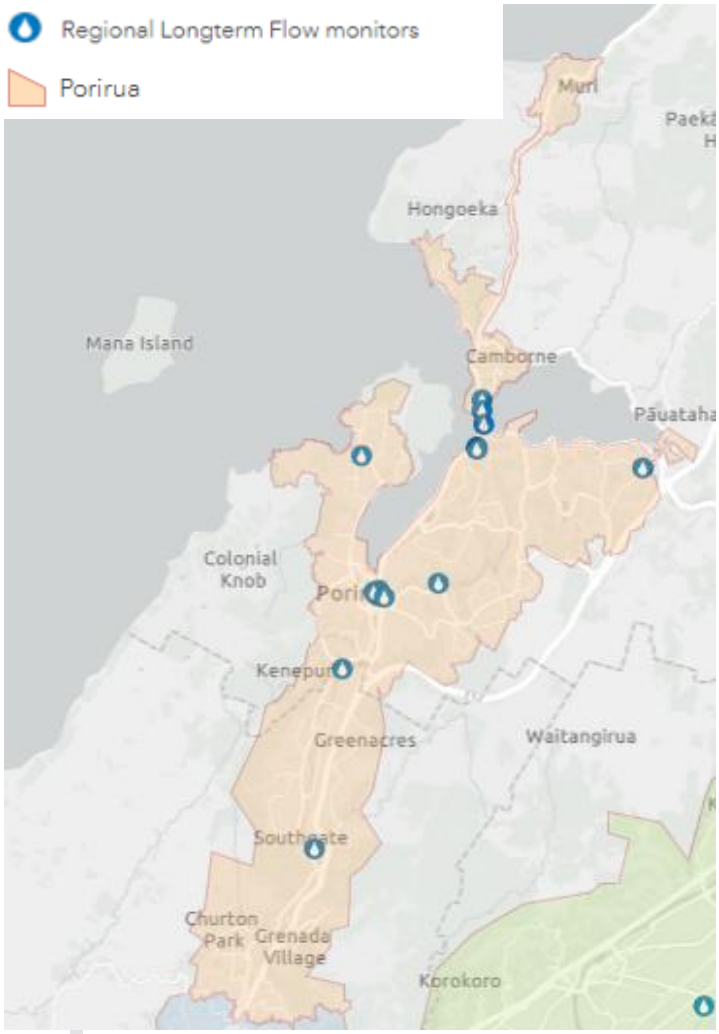


Figure 2 - Map of Active Wastewater Long Term Flow and Overflow Monitoring Sites in Porirua WWTP Catchment

There are currently eight rain gauges installed and operating in the Porirua WWTP catchment area. This data is used in conjunction with wastewater flow monitoring data to understand the extent of inflow and infiltration. The rain gauges sites are listed below;

- Porirua Stream at Woodridge
- Porirua Stream at Seton Nossiter Park
- Porirua Stream at Tawa Junction
- Porirua Stream at Tawa Pool
- RG01 – Porirua LT Flow Monitoring
- Met Station at Porirua Elsdon Park AWS
- Duck Creek at James Cook Reservoir
- Taupo Stream at Whenua Tapu

Wastewater Modelling

A wastewater model was finalised for the Porirua Catchment that has previously been used by to undertake an optioneering study to inform the Network Improvement Plan.

Condition Assessments

Condition Assessment using closed circuit television (CCTV) footage of wastewater networks is used to identify faults, determine the condition of assets, and inform repair and renewal programs.

The Very High Critical Assets (VHCA) condition assessments completed as of June 2022 are shown in Figure 3 below. The primary inspection techniques were CCTV and laser profiling for wastewater pipes and CCTV for stormwater pipes. For the inspections represented in the below map, approximately 10% were completed in 2020-2021 financial year and 90% completed in the 2021-2022 year. For Porirua wastewater treatment plant catchment area, see orange shaded area in Figure 1 above.

Planned condition assessments of lower criticality assets in 2021-2022 using CCTV, will be confirmed once budgets are awarded in July 2022.

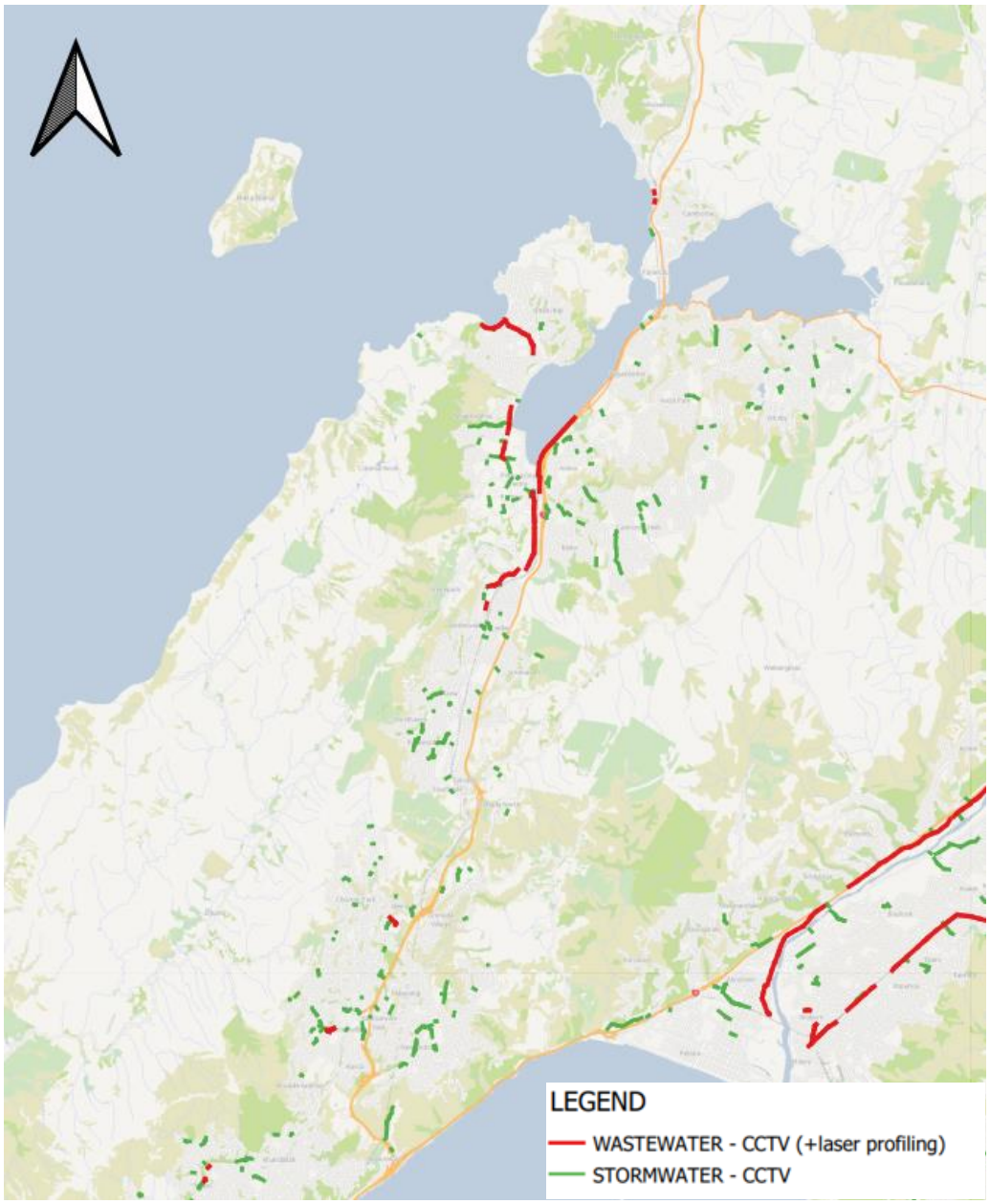


Figure 3 - Map of CCTV of PCC Wastewater and Stormwater Mains undertaken as of June 2022

Stormwater and Wastewater Capital Projects

The following table provides a summary of planned capital projects for wastewater and stormwater assets that were undertaken in 2021-2022 or are scheduled for 2022-2023. The projects below are proposed and subject to final approval by council. Ongoing operational work such as investigations and reactive maintenance and renewals are also carried out in addition to the planned work listed below. Some projects in the table below are noted in both columns as the project is delivered over multiple years or ongoing programmes of work.

Table 1 - Stormwater and Wastewater Capital Projects in the Porirua WWTP Catchment

Activity	2021/2022	2022/2023
Stormwater	• SW Manhole Cover Improvements • Porirua Central Stormwater Upgrades • Whitehouse Road Stormwater Upgrade • Main Road (68-74) Tawa SW Improvement • Central Tawa Catchment Stormwater Improvements	• Main Road (68-74) Tawa Stormwater Improvement • Central Tawa Catchment Stormwater Improvements • WCC-CPX-Tawa Beauchamp Collins SW Upgrade
Wastewater	• WW Manhole Cover Improvements • Titahi Bay WW Pipeline Renewal • Renewal of Wastewater Mains under the Stimulus Funding Programme • Rawahiti Road WW Renewal • Duck Creek PS and Storage Tank • Plimmerton Wastewater Renewals • Stebbings Wastewater pipe upgrade Stage 1	• Plimmerton WW Renewals (Steyne Ave) • PCC-WW-VHCA Pipe Renewal Programme • Wastewater (excl JV) - Network – Renewals • Kenepuru Trunk (Bothamley Park) wastewater upgrade • PCC WW manhole cover safety improvements • Paremata to Porirua WW Trunk Main Upgrade • Duck Creek Pump Station wastewater storage tank • Plimmerton WW Renewals • SPS30 - Muri Road pump station renewal - pipework, electrical and pumps • PS6B rising main upgrade • North Plimmerton wastewater storage • PS6B pump station upgrade • Whitehouse Road (Titahi Bay) Wastewater Renewals - stages 3 and 4 • Wastewater (excl JV) - Pump Station – Renewals • PCC Wastewater Pump Stations PLANNED Renewals • SPS21 - Brendan Beach pump station renewal - electrical and pumps • SPS22 - Ocean Parade pump station renewal - electrical and pumps • SPS23 - Pukerua Beach Road pump station renewal - electrical and pumps • Wastewater pump station upgrades

		• Mana Esplanade Pipeline cross connection stage2 • Discovery Dr Wastewater rehabilitation • SPS11 - Moana Road pump station renewal - pipework, electrical and pumps • SPS2 - Postgate Drive pump station renewal - electrical and pumps • Surcharging Manholes - Wastewater • WR PCC Wastewater Renewals Titahi Bay 20-21 • Titahi Bay Wastewater pipeline re-lining

Joint Venture (JV) Network

The following table provides a summary of planned capital projects for the JV Trunk Assets that were undertaken in 2021-2022 or are scheduled for 2022 – 2023. The projects below are proposed and subject to final approval by council.

Table 2 - Projects for JV Wastewater Network

Activity	2021/2022	2022/2023
Wastewater JV		• Porirua Central City Wastewater Storage tank • Tangare Drive WWPS Flow Splitter Replacement • PCC JV WWTP PLANNED Renewals • PCC JV WWTP REACTIVE Renewals • PCC WWJV - Major Pump Stations PLANNED Renewals • PCC WWA JV Network Upgrades - Trunk Pipelines - PCC Master Planning