

Porirua Wastewater Treatment Plant

2019/2020 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 report will cover the annual period from July 2019 to June 2020 as requested in this resource consent.

WGN 980083 (02)

The above resource consent was required to discharge contaminants to the air from the Porirua Wastewater Treatment Plant.

WGN 980083 (03)

The above resource consent was required to occupy the coastal marine area with a concrete deflection wall and outfall structures. There are no annual reporting requirements for this resource consent.

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Resource Consent

WGN980083

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 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 following outlines the conditions of the resource consent required for this report and all relevant information.

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.

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.

The following report will reference the conditions of these resource consents when they are applicable.

WGN980083

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/m³ and no more than 10% of 90 consecutive daily values shall exceed 75g/m³.
 - (ii) Suspended solids: Geometric mean of 90 day consecutive daily suspended solids values shall not exceed 30g/m³ and no more than 10% of 90 consecutive daily values shall exceed 75g/m³.
- (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/m³ and no more than 10% of 90 consecutive daily values shall exceed 75g/m³.
 - (ii) Suspended Solids: Geometric mean of 90 day consecutive suspended solids values shall not exceed 30g/m³ and no more than 10% of 90 consecutive daily values shall exceed 75g/m³.
- (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)

Below is a summary of the geometric mean and percent compliance for the Biological Oxygen Demand and the Suspended Solids daily analytical results.

Please note that in Condition (11) (a). It makes reference to both the 90th percentile and 10% of 90 consecutive days for BOD5 and SS. The two calculation methodologies are very different. During a meeting held on 10th December 2019 and through subsequent emails with the GWRC resource consent officer on 19th February 2020, the methodology was discussed. The methodology adopted in this report will be the 10% of the 90 consecutive days.

Date	Biological Oxygen Demand		Suspended Solids	
	90 Day Geometric Mean	90 Day Percent Compliance	90 Day Geometric Mean	90 Day Percent Compliance
	g/m ³	%	g/m ³	%
31 July 2019	5.6	100	5.8	100
31 August 2019	5.6	100	6.0	100
30 September 2019	5.8	100	6.2	100
31 October 2019	6.8	100	6.9	100
30 November 2019	6.8	100	6.6	100
31 December 2019	6.5	100	6.4	100
31 January 2020	6.2	100	6.1	100
28 February 2020	6.4	100	6.3	100
31 March 2020	6	100	5.9	100
30 April 2020	4.8	100	4.8	100
31 May 2020	3.8	100	3.8	100
30 June 2020	4	100	4	100
Limits	30	90	30	90

Table 1: 90 Consecutive Day Geometric Mean and Percent Compliance

For all daily effluent geometric mean and percent compliance of Biological Oxygen Demand and Suspended Solids results please see Appendix i: Daily Effluent Biological Oxygen Demand and Suspended Solids Results. All analytical results data sheets can be available upon request.

Section (b)

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. A maximum of three samples above 2,000cfu/100mL are permissible.

Date	Faecal Coliforms	
	20 Sample Geometric Mean	20 Sample Percent Compliance
	cfu/100mL	%
31 July 2019	87	100
31 August 2019	12	100
30 September 2019	5	100
31 October 2019	9	100
30 November 2019	14	100
31 December 2019	12	95
31 January 2020	4	100
28 February 2020	15	100
31 March 2020	35	90
30 April 2020	10	100
31 May 2020	5	100
30 June 2020	55	95
Limits	1000	85

Table 2: Monthly Faecal Coliform Geometric Mean and Percent Compliance

For all faecal coliform results please see Appendix i: Effluent Faecal Coliform Results. All analytical results can be available upon request.

Section (c)

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

Compound	Units	Limit	10/09/2019	19/12/2019	19/02/2020	21/04/2020
Arsenic	g/m ³	0.5	0.002	0.003	0.001	0.001
Cadmium as the element	g/m ³	0.05	0.001	0.001	n/a	0.0005
Chromium	g/m ³	0.2	0.001	0.002	0.003	0.005
Copper as the element	g/m ³	0.8	0.003	0.003	0.002	0.002
Nickel as the element	g/m ³	0.05	0.001	0.001	0.002	0.001
Lead as the element	g/m ³	0.5	0.001	0.001	0.001	0.001
Zinc as the element	g/m ³	2.0	0.028	0.022	0.025	0.014
Mercury as the element	g/m ³	0.002	0.0005	0.001	0.001	0.0005
Phenol	g/m ³	0.2	0.05	0.05	n/a	0.004
Cyanide as CN	g/m ³	0.1	0.005	0.005	n/a	0.005
Chlorinated hydrocarbons	g/m ³	0.01	See note	See note	n/a	See note

Table 3: 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.

In the 3rd quarter, Veolia switched the contracted laboratory performing the analysis. Unfortunately, the previous laboratory supplier performed the incorrect sampling profile in February 2020. Therefore, the cadmium, phenol, cyanide, and chlorinated hydrocarbons results are missing. A second sample was submitted to the original laboratory contractor in February 2020 but it was not analyzed due to the end of their contract.

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 2019 regarding the relocation of the control site sampling location. GWRC agreed to the new sample location via e-mail on 12th September 2019 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.

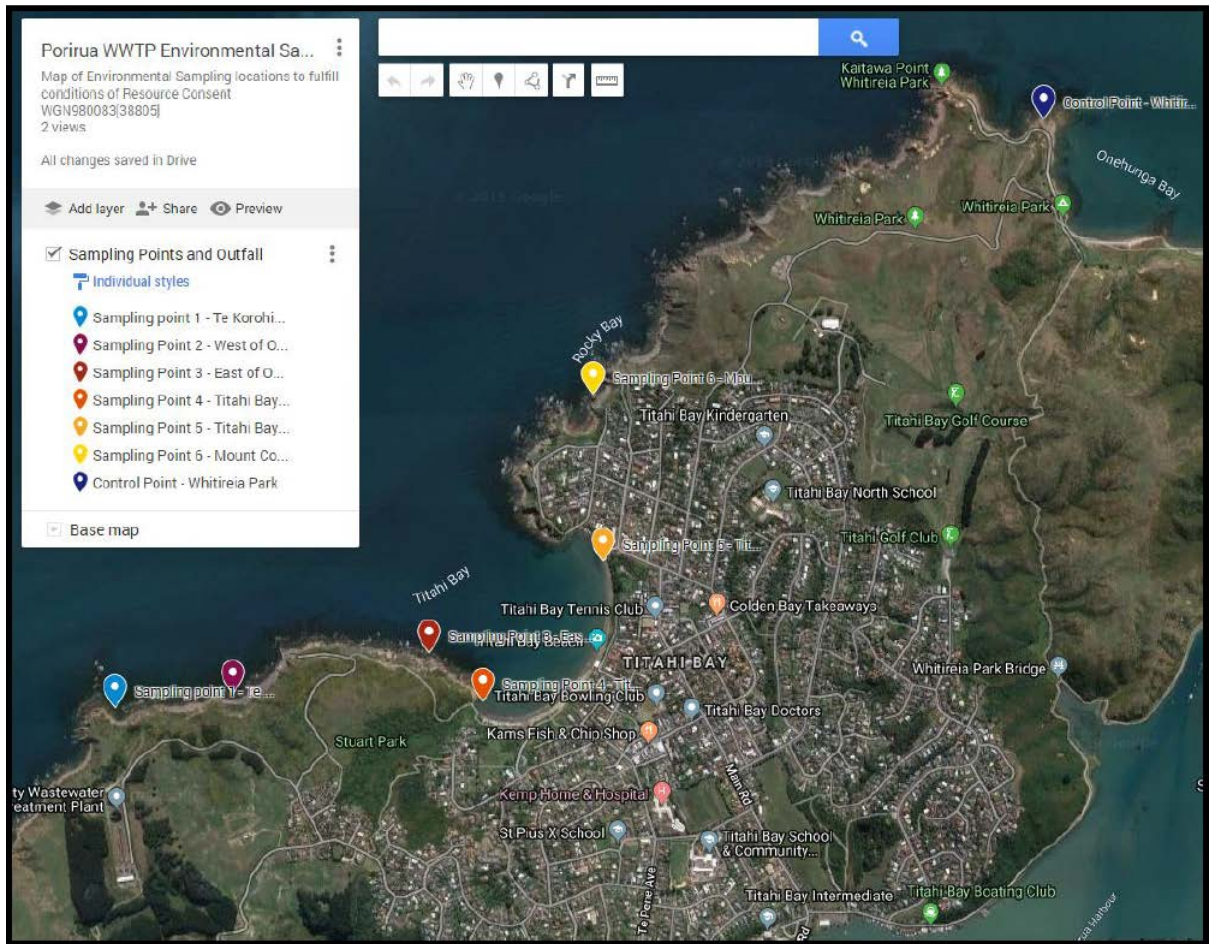


Figure 1: Shoreline Monitoring Sampling Sites

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 i: 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 2019	2	0
August 2019	1	0
September 2019	0	0
October 2019	1	0
November 2019	2	0
December 2019	2	0
January 2020	0	0
February 2020	0	0
March 2020	0	0
April 2020	0	0
May 2020	2	0
June 2020	2	0

Table 4: Monthly Bypass and Overflow Events

Please note that shoreline monitoring was not initiated for bypass discharge events where the volume was less than 1,000m³, as agreed with GWRC.

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.

There were no exceedances or breach in the conditions for the period of July 2019 to June 2020.

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 2019 to June 2020 reporting year.

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	
14/07/2019 12:14	14/07/2019 15:12	02hr 58m	n/a	602	Y	Wet Weather
16/07/2019 5:19	16/07/2019 11:57	06hr 38m	n/a	1,747	Y	Wet Weather
11/08/2019 22:55	12/08/2019 23:31	24hr 36m	n/a	1,164	Y	Wet Weather
23/10/2019 10:30	23/10/2019 11:33	01hr 02m	4,086	5	Y	Wet Weather
11/11/2019 11:37	11/11/2019 13:01	01hr 24m	6,392	220	Y	Wet Weather
14/11/2019 7:46	14/11/2019 8:09	00hr 22m	1,847	18	Y	Wet Weather
8/12/2019 5:57	8/12/2019 23:57	18hr 00m	71,835	4,529	Y	Wet Weather
17/12/2019 23:13	18/12/2019 2:10	02hr 56m	12,008	421	Y	Wet Weather
5/05/2020 16:42	6/05/2020 0:48	08hr 06m	10,914	162	Y	Wet Weather
25/05/2020 8:50	25/05/2020 12:50	04hr 00m	2,817	246	Y	Wet Weather
4/06/2020 20:13	5/06/2020 11:16	15hr 03m	43,498	2,511	Y	Wet Weather
18/06/2020 2:19	19/06/2020 11:14	32hr 55m	60,363	2,829	Y	Wet Weather

Table 5: 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 ii.

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. Information is provided regularly to the group and meetings are organized. A meeting was held on the 9th November 2019 which also discussed the consent application of the treatment plant and a tour of the plant for those who were interested.

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 month 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 surveys 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.

There has been one complaint during the July 2019 to June 2020 reporting period.

A member of the public contacted the Manager Wastewater Contracts, Anna Hector, on 7th March 2020 in the morning regarding an odour on his property. The weather conditions at the time were a northerly wind at approximately 21km/h. She attended the site and detected an odour.

To resolve this situation, Veolia together with Wellington Water are investigating the ventilation system at the Porirua WWTP. The following activities are currently in progress:

Activity	Status
Wastewater Contracts Manager site visit to validate the odour complaint	Completed
Odour control survey and ventilation assessment	Completed
Veolia to do site visit to familiarise the locations of odour complaint	TBC

Appendix i

Effluent Faecal Coliforms Results

Day	Faecal Coliform			Faecal Coliforms			Faecal Coliforms		
	July 2019			August 2019			September 2019		
	Results	20 Day Geometric Mean	Compliance	Results	20 Day Geometric Mean	Compliance	Results	20 Day Geometric Mean	Compliance
	cfu/100mL	cfu/100mL	%	cfu/100mL	cfu/100mL	%	cfu/100mL	cfu/100mL	%
1	8			32			4		
2	300			4			4		
3	310			4			8		
4	220			4			0		
5	160			4			4		
6	80			4			4		
7	370			4			4		
8	820			4			0		
9	800			4			20		
10	550			8			4		
11	560			4			4		
12	24			200			4		
13	12			76			4		
14	36			8			8		
15	46			4			8		
16	80			310			4		
17	68			4			4		
18	8			28			4		
19	12			350			12		
20	16			4			4		
21	4			4			4		
22	2			4			0		
23	60			4			12		
24	4			4			12		
25	50			4			4		
26	8			4			28		
27	4			4			72		
28	2			4			4		
29	900			4			12		
30	360			4			12	5	100
31	830	87	100	4	12	100			
Limits	2000	1000	85	2000	1000	85	2000	1000	85

Please note that analytical results highlighted in amber are above the 1000cfu/100mL geometric mean limit. Analytical results highlighted in red are above the 2000cfu/100mL percent compliance limit.

Day	Faecal Coliform			Faecal Coliforms			Faecal Coliforms		
	October 2019			November 2019			December 2019		
	Results	20 Day Geometric Mean	Compliance	Results	20 Day Geometric Mean	Compliance	Results	20 Day Geometric Mean	Compliance
	cfu/100mL	cfu/100mL	%	cfu/100mL	cfu/100mL	%	cfu/100mL	cfu/100mL	%
1	4			4			8		
2	4			4			40		
3	8			4			12		
4	4			77			8		
5	4			12			4		
6	4			4			8		
7	4			4			4		
8	4			4			5700		
9	8			4			20		
10	4			20			4		
11	52			340			4		
12	4			190			4		
13	4			12			4		
14	20			1700			20		
15	140			100			4		
16	12			4			4		
17	4			4			4		
18	4			12			100		
19	180			4			8		
20	12			4			15		
21	16			4			8		
22	4			12			4		
23	35			4			8		
24	8			4			40		
25	4			4			8		
26	4			4			4		
27	4			4			4		
28	4			4			4		
29	8			4			180		
30	12			4	14	100	4		
31	4	9	100				4	12	95
Limits	2000	1000	85	2000	1000	85	2000	1000	85

Day	Faecal Coliform			Faecal Coliforms			Faecal Coliforms		
	January 2020			February 2020			March 2020		
	Results	20 Day Geometric Mean	Compliance	Results	20 Day Geometric Mean	Compliance	Results	20 Day Geometric Mean	Compliance
	cfu/100mL	cfu/100mL	%	cfu/100mL	cfu/100mL	%	cfu/100mL	cfu/100mL	%
1	4			4			3700		
2	4			4			15		
3	4			4			8		
4	4			16			38		
5	4			27			28		
6	4			4			16		
7	4			4			4		
8	4			69			8		
9	4			170			3200		
10	4			4			760		
11	4			4			670		
12	4			4			16		
13	4			4			60		
14	4			88			20		
15	4			4			50		
16	4			4			8		
17	4			120			12		
18	4			170			12		
19	4			110			4		
20	4			130			4		
21	4			27			750		
22	4			4			1200		
23	4			4			3		
24	12			4			5		
25	4			8			18		
26	4			32			8		
27	4			12			52		
28	4			60			720		
29	4			3000	15	100	48		
30	4						42		
31	4	4	100				15	35	90
Limits	2000	1000	85	2000	1000	85	2000	1000	85

Day	Faecal Coliform			Faecal Coliforms			Faecal Coliforms		
	April 2020			May 2020			June 2020		
	Results	20 Day Geometric Mean	Compliance	Results	20 Day Geometric Mean	Compliance	Results	20 Day Geometric Mean	Compliance
	cfu/100mL	cfu/100mL	%	cfu/100mL	cfu/100mL	%	cfu/100mL	cfu/100mL	%
1	8			2			3		
2	7			2			220		
3	2			2			240		
4	2			210			790		
5	2			3			390		
6	10			430			400		
7	7			2			110		
8	7			2			290		
9	2			2			230		
10	730			5			42		
11	10			7			62		
12	3			11			3		
13	1300			2			2		
14	13			2			2		
15	10			2			2		
16	31			2			3		
17	13			2			13		
18	7			8			13		
19	8			5			490000		
20	3			76			48		
21	2			2			41		
22	2			8			150		
23	2			5			82		
24	5			26			220		
25	2			65000			68		
26	2			800			64		
27	2			7			3		
28	8			2			3		
29	7			2			270		
30	2	10	100	16			10	55	95
31				11	5	100			
Limits	2000	1000	85	2000	1000	85	2000	1000	85

Shoreline Monitoring Data

Date	Te Korohiwa Rocks								200m East of Outfall								200m South West of Outfall								Control								
	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/yy	cfu/100 mL	cfu/100 mL	--	--	--	--	Y/N	--	cfu/100 mL	cfu/100 ml	--	--	--	--	Y/N	--	cfu/100 mL	cfu/100 ml	--	--	--	--	Y/N	--	cfu/100 mL	cfu/100 ml	--	--	--	--	Y/N	--	
16/07/2019	470	620	N	Strong	High tide	Swell s	Y - 24hr	Contaminati on	2100	3000	N	Strong	High tide	Swell s	Y - 24hr	Contaminati on	3100	2100	N	Strong	High tide	Swell s	Y - 24hr	Contaminati on	450	410	N	Strong	High tide	Swell s	Y - 24hr	Contaminati on	
18/07/2019	110	370	N	Moderate	High tide	Swell s	Y - 72hr		44	100	N	Moderate	High tide	Swell s	Y - 72hr		68	100	N	Moderate	High tide	Swell s	Y - 72hr		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Missing Sample
22/07/2019	24	96	N	Moderate	High tide	Calm	Y - 144hr		8	24	N	Moderate	High tide	Calm	Y - 144hr		12	16	N	Moderate	High tide	Calm	Y - 144hr		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Missing Sample
30/07/2019	100	280	N	Moderate	High tide	Calm	N/A	Contaminati on	140	280	N	Moderate	High tide	Calm	N/A	Contaminati on	140	420	N	Moderate	High tide	Calm	N/A	Contaminati on	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Missing Sample
13/08/2019	12	12	N	Moderate	Half tide	0.5m swell	Y - 24hr	N/A	12	4	N	Moderate	Half tide	1m swell	Y- 24hr	N/A	16	20	N	Moderate	Half tide	1m swell	Y - 24hr	N/A	40	20	N	Moderate	Half tide	0.5m swell	Y - 24hr	N/A	
15/08/2019	8	4	S	Calm	Half tide	0.5 swell	Y - 72hr	N/A	12	170	S	Calm	Half tide	0.5m swell	Y- 72hr	N/A	4	16	S	Calm	Half Tide	Calm	Y- 24hr	N/A	4	4	S	Calm	Half tide	Calm	Y - 72hr	N/A	
17/08/2019	4	4	S	Light	Half tide	Calm	Y - 144hr	N/A	4	4	S	Calm	Half tide	Calm	Y - 144hr	N/A	4	4	S	Calm	Half Tide	Calm	Y - 144hr	N/A	4	4	S	Moderate	Half tide	Calm	Y - 144hr	N/A	
30/08/2019	20	8	N	Light	High tide	0.5m swell	N/A	N/A	4	4	N	Calm	High tide	0.5m Swell	N/A	N/A	4	4	N	Light	Full tide	0.5m swell	N/A	N/A	4	4	N	Light	High Tide	0.5m swell	N/A	N/A	
28/10/2019	4	12	N	Strong	Low	1m Swell s	N	N/A	4	4	N	Strong	Low	1m Swell s	N	N/A	4	4	N	Strong	Low	1m Swell s	N	N/A	4	4	N	Strong	Low	1m Swell s	N	N/A	
20/11/2019	4	4	N	Moderate	Mediu m	1m swell s	N	N/A	4	4	N	Moderate	Mediu m	1m swell s	N	N/A	4	4	N	Moderate	Mediu m	1m swell s	N	N/A	4	4	N	Moderate	Mediu m	1m swell s	N	N/A	
9/12/2019	4	4	Southerly	Light	Low	0.5 m swell	Y - 24hrs	N/A	4	4	Southerly	Light	Low	0.5 m swell	Y - 24hrs	N/A	4	4	Southerly	Light	Low	0.5 m swell	Y - 24hrs	N/A	130	600	Southerly	Light	Low	0.5 m swell	Y - 24hrs	Unknown	
11/12/2019	4	4	Southerly	Moderate	High	0.5 m swell	Y - 72hrs	N/A	4	4	Southerly	Moderate	High	0.5 m swell	Y - 72hrs	N/A	12	36	Southerly	Moderate	High	0.5 m swell	Y - 72hrs	N/A	8	4	Southerly	Moderate	High	0.5 m swell	Y - 72hrs	N/A	
13/12/2019	4	4	Northerly	Strong	High	1 m swell	Y - 144hrs	N/A	4	4	Northerly	Strong	High	1 m swell	Y - 144hrs	N/A	4	8	Northerly	Strong	High	1 m swell	Y - 144hrs	N/A	8	4	Northerly	Strong	High	1 m swell	Y - 144hrs	N/A	
17/12/2019	12	12	Northerly	Moderate	Low	0.5 m swell	Y	N/A	36	16	Northerly	Moderate	Low	0.5 m swell	Y	N/A	31	4	Northerly	Moderate	Low	0.5 m swell	Y	N/A	4	20	Northerly	Moderate	Low	0.5 m swell	Y	N/A	
21/01/2020	4	4	N	Light	Calm	Low	N	N/A	4	4	N	Light	Calm	Low	N	N/A	4	4	N	Light	Calm	Low	N	N/A	4	4	N	Light	Calm	Low	N	N/A	
25/02/2020	4	8	N	Light	Low	Calm	N	N/A	4	4	N	Light	Low	Calm	N	N/A	4	4	N	Light	Low	Calm	N	N/A	4	4	N	Light	Low	Calm	N	N/A	
30/03/2020	3.3	1.6	N	Light	High	Calm	N	N/A	1.6	1.6	N	Light	High	Calm	N	N/A	1.6	1.6	N	Light	High	Calm	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
15/04/2020	6.6	6.6	S	Light	High	Flood	N	N/A	6.6	1.6	S	Light	High	Flood	N	N/A	4.9	1.6	S	Light	High	Flood	N	N/A	N/A	N/A	S	Light	High	Flood	N	N/A	
14/05/2020	1.6	1.6	S	Light	High	Flood	N	N/A	1.6	1.6	S	Light	High	Flood	N	N/A	1.6	4.9	S	Light	High	Flood	N	N/A	9.8	1.6	S	Light	High	Flood	N	N/A	
5/06/2020	3.6	11	S	Moderate	High	Ebb	Y - 24hrs	N/A	380	540	S	Moderate	High	Ebb	Y - 24hrs	Unknown	27	35	S	Moderate	High	Ebb	Y - 24hrs	N/A	3.6	3.6	S	Moderate	High	Ebb	Y - 24hrs	N/A	
7/06/2020	480	440	NW	Light	Mid	Flood	Y - 72hrs	Unknown	7.3	5.5	NW	Light	Mid	Flood	Y - 72hrs	N/A	1.8	1.8	NW	Light	Mid	Flood	Y - 72hrs	N/A	9.8	6.7	NW	Light	Mid	Flood	Y - 72hrs	N/A	
10/06/2020	20	11	SW	Light	Low	Flood	Y - 144hrs	N/A	3.3	1.6	SW	Light	Low	Flood	Y - 144hrs	N/A	31	9.8	SW	Light	Low	Flood	Y - 144hrs	N/A	1.6	1.6	SW	Light	Low	Flood	Y - 144hrs	N/A	
18/06/2020	70	62	S	Moderate	Mid	Flood	Y - 24hrs	N/A	2000	960	S	Moderate	Mid	Flood	Y - 24hrs	Unknown	52	25	S	Moderate	Mid	Flood	Y - 24hrs	N/A	76	94	S	Moderate	Mid	Flood	Y - 24hrs	N/A	
20/06/2020	1.8	1.8	S	Moderate	Mid	Flood	Y - 72hrs	N/A	56	31	S	Moderate	Mid	Flood	Y - 72hrs	N/A	29	42	S	Moderate	Mid	Flood	Y - 72hrs	N/A	1.8	1.8	S	Moderate	Mid	Flood	Y - 72hrs	N/A	
23/06/2020	1.6	4.9	NE	Moderate	Mid	Flood	Y - 144hrs	N/A	15	18	NE	Moderate	Mid	Flood	Y - 144hrs	N/A	13	11	NE	Moderate	Mid	Flood	Y - 144hrs	N/A	1.6	3.3	NE	Moderate	Mid	Flood	Y - 144hrs	N/A	
24/06/2020	1.6	4.9	S	Strong	High	Ebb	N	N/A	1.6	6.6	S	Strong	High	Ebb	N	N/A	9.8	1.6	S	Strong	High	Ebb	N	N/A	1.6	1.6	S	Strong	High	Ebb	N	N/A	

Date	South End Titahi Bay								Titahi Bay Beach								Mount Cooper								Control								
	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)	
	cfu/100 mL	cfu/100 ml	--	--	--	--	Y/N	--	cfu/100 mL	cfu/100 ml	--	--	--	--	Y/N	--	cfu/100 mL	cfu/100 ml	--	--	--	--	Y/N	--	cfu/100 mL	cfu/100 ml	--	--	--	--	Y/N	--	
16/07/2019	5300	2600	N	Strong	High tide	Swells	Y - 24hr	Contamination	450	650	N	Strong	High tide	Swells	Y - 24hr	Contamination	340	320	N	Strong	High tide	Swells	Y - 24hr	Contamination	450	410	N	Strong	High tide	Swells	Y - 24hr	Contamination	
18/07/2019	28	52	N	Moderate	High tide	Swells	Y - 72hr		8	16	N	Moderate	High tide	Swells	Y - 72hr		24	60	N	Moderate	High tide	Swells	Y - 72hr		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Missing Sample
22/07/2019	2400	84	N	Moderate	High tide	Calm	Y - 144hr	Contamination	110	4	N	Moderate	High tide	Calm	Y - 144hr		44	16	N	Moderate	High tide	Calm	Y - 144hr		N/A	N/A	N/A	N/A	N/A	N/A	N/A	Missing Sample	
30/07/2019	330	2000	N	Moderate	High tide	Calm	N/A	Contamination	580	3300	N	Moderate	High tide	Calm	N/A	Contamination	210	260	N	Moderate	High tide	Calm	N/A	Contamination	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Missing Sample	
13/08/2019	16	16	N	Light	Half tide	0.5m swell	Y - 24hr	N/A	32	16	N	Moderate	Half tide	1m swell	Y - 24hr		40	28	N	Moderate	Half tide	1m swell	Y - 24hr	N/A	40	20	N	Moderate	Half tide	0.5m swell	Y - 24hr	N/A	
15/08/2019	4	16	S	Calm	Half tide	Calm	Y - 72hr	N/A	4	20	S	Calm	Half tide	Calm	Y-72hr		8	12	S	Calm	Half tide	0.5m swell	Y - 72hr	N/A	4	4	S	Calm	Half tide	Calm	Y - 72hr	N/A	
17/08/2019	4	8	S	Moderate	Half tide	Calm	Y - 144hr		64	40	S	Calm	Half tide	Calm	Y - 144hr		4	4	S	Light	Half tide	0.5m swell	Y - 144hr	N/A	4	4	S	Moderate	Half tide	Calm	Y - 144hr	N/A	
30/08/2019	12	16	N	Light	High tide	0.5m swell	N/A	N/A	260	4	N	Calm	High Tide	0.5m swell	N/A	N/A	4	4	N	Light	High tide	1m swell	N/A	N/A	4	4	N	Light	High Tide	0.5m swell	N/A	N/A	
28/10/2019	4	4	N	Strong	Low	1m Swells	N	N/A	4	4	N	Strong	Low	1m Swells	N	N/A	4	4	N	Strong	Low	1m Swells	N	N/A	4	4	N	Strong	Low	1m Swells	N	N/A	
20/11/2019	4	24	N	Moderate	Medium	1m swells	N	N/A	4	4	N	Moderate	Medium	1m swells	N	N/A	4	4	N	Moderate	Medium	1m swells	N	N/A	4	4	N	Moderate	Medium	1m swells	N	N/A	
9/12/2019	4	8	Southerly	Light	Low	0.5 m swell	Y - 24hrs	N/A	15	24	Southerly	Light	Low	0.5 m swell	Y - 24hrs	N/A	4	35	Southerly	Light	Low	0.5 m swell	Y - 24hrs	N/A	130	600	Southerly	Light	Low	0.5 m swell	Y - 24hrs	Unknown	
11/12/2019	4	4	Southerly	Moderate	High	0.5 m swell	Y - 72hrs	N/A	240	3000	Southerly	Moderate	High	0.5 m swell	Y - 72hrs	Unknown	4	4	Southerly	Moderate	High	0.5 m swell	Y - 72hrs	N/A	8	4	Southerly	Moderate	High	0.5 m swell	Y - 72hrs	N/A	
13/12/2019	4	4	Northerly	Strong	High	1 m swell	Y - 144hrs	N/A	4800	72	Northerly	Strong	High	1 m swell	Y - 144hrs	Unknown	3000	4	Northerly	Strong	High	1 m swell	Y - 144hrs	Unknown	8	4	Northerly	Strong	High	1 m swell	Y - 144hrs	N/A	
17/12/2019	12	48	Northerly	Moderate	Low	0.5 m swell	Y	N/A	280	350	Northerly	Moderate	Low	0.5 m swell	Y	Unknown	4	4	Northerly	Moderate	Low	0.5 m swell	Y	N/A	4	20	Northerly	Moderate	Low	0.5 m swell	Y	N/A	
21/01/2020	4	4	N	Light	Calm	Low	N	N/A	52	12	N	Light	Calm	Low	N	N/A	4	4	N	Light	Calm	Low	N	N/A	4	4	N	Light	Calm	Low	N	N/A	
25/02/2020	4	8	N	Light	Low	Calm	N	N/A	46	24	N	Light	Low	Calm	N	N/A	4	4	N	Light	Low	Calm	N	N/A	4	4	N	Light	Low	Calm	N	N/A	
30/03/2020	16	1.6	N	Light	High	Calm	N	N/A	3.3	9.8	N	Light	High	Calm	N	N/A	1.6	1.6	N	Light	High	Calm	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
15/04/2020	21	9.8	S	Light	High	Flood	N	N/A	16	4.9	S	Light	High	Flood	N	N/A	1.6	1.6	S	Light	High	Flood	N	N/A	N/A	N/A	S	Light	High	Flood	N	N/A	
14/05/2020	25	1.6	S	Light	High	Flood	N	N/A	3.3	3.3	S	Light	High	Flood	N	N/A	1.6	1.6	S	Light	High	Flood	N	N/A	9.8	1.6	S	Light	High	Flood	N	N/A	
5/06/2020	360	380	S	Moderate	High	Ebb	Y - 24hrs	Unknown	190	110	S	Moderate	High	Ebb	Y - 24hrs	9.1	3.6	S	Moderate	High	Ebb	Y - 24hrs	N/A	3.6	3.6	S	Moderate	High	Ebb	Y - 24hrs	N/A	3.6	
7/06/2020	7.3	5.5	NW	Light	Mid	Flood	Y - 72hrs	N/A	13	68	NW	Light	Mid	Flood	Y - 72hrs	1.8	5.5	NW	Light	Mid	Flood	Y - 72hrs	N/A	9.8	6.7	NW	Light	Mid	Flood	Y - 72hrs	N/A	9.8	
10/06/2020	30	44	SW	Light	Low	Flood	Y - 144hrs	N/A	30	54	SW	Light	Low	Flood	Y - 144hrs	8.2	3.3	SW	Light	Low	Flood	Y - 144hrs	N/A	1.6	1.6	SW	Light	Low	Flood	Y - 144hrs	N/A	1.6	
18/06/2020	58	20	S	Moderate	Mid	Flood	Y - 24hrs	N/A	44	56	S	Moderate	Mid	Flood	Y - 24hrs	60	64	S	Moderate	Mid	Flood	Y - 24hrs	N/A	76	94	S	Moderate	Mid	Flood	Y - 24hrs	N/A	76	
20/06/2020	440	660	S	Moderate	Mid	Flood	Y - 72hrs	Unknown	36	58	S	Moderate	Mid	Flood	Y - 72hrs	1.8	1.8	S	Moderate	Mid	Flood	Y - 72hrs	N/A	1.8	1.8	S	Moderate	Mid	Flood	Y - 72hrs	N/A	1.8	
23/06/2020	56	88	NE	Moderate	Mid	Flood	Y - 144hrs	N/A	66	80	NE	Moderate	Mid	Flood	Y - 144hrs	3.3	13	NE	Moderate	Mid	Flood	Y - 144hrs	N/A	1.6	3.3	NE	Moderate	Mid	Flood	Y - 144hrs	N/A	1.6	
24/06/2020	3.3	1.6	S	Strong	High	Ebb	N	N/A	1.6	1.6	S	Strong	High	Ebb	N	3.3	1.6	S	Strong	High	Ebb	N	N/A	1.6	1.6	S	Strong	High	Ebb	N	N/A	1.6	

Appendix ii

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 WWTP to also improve waterway health.

Inflow Surveys

Inflow Surveys have been undertaken in 2019-2020 in the Porirua WWTP Catchment and are due for completion in 2020-2021. The catchments where inflow survey work is in progress and planned to be completed this coming financial year include;

- Churton Park
- Duck Creek/Whitby

Churton Park is nearing completion with only final inspections required which are planned for August 2020. The initial inspections in Duck Creek commenced in June 2020 and private fault resolution achieved by working with property owners will be undertaken this financial year. Public faults identified through the inflow surveys, such as manhole repairs and wastewater main repairs will be undertaken this financial year also.

A consultant specialising in Inflow and Infiltration Management was also engaged to support regional strategic work in 2019-2020 and is continuing some work in 2020-2021.

Flow Monitoring and Rain Gauge Monitoring

There are currently 11 wastewater flow and 5 overflow monitoring sites within the Porirua WWTP Catchment. These overflow monitoring sites are part of the long term monitoring contract which will end in June 2021 and therefore reassessment of priority monitoring sites will be carried out to determine whether monitoring these sites will continue or change after June 2021.

There are currently 8 rain gauges installed and operating in the Porirua WWTP catchment area. Wellington Water utilise this data to assist in a variety of ways such as aligning with flow monitoring data to understand impact on 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

There is a wastewater model for the Porirua Catchment that has previously been used by consultants to undertake an optioneering study of the model and was used to develop the Network Improvement Plan.

CCTV Inspections

CCTV of wastewater networks are an ongoing program with 3.4km of CCTV inspections carried out in 2019-2020 and 3.1km of CCTV of wastewater networks planned for 2020-2021. Figure 1 shows a map of the wastewater mains surveyed in 2019-2020 financial year.

Figure 2 shows a map of the wastewater mains planned for 2020-2021 financial year. The CCTV footage is used to identify faults and determine the condition of assets.

Figure 1 - Map of CCTV of Wastewater Mains completed in PCC area in 2019-2020

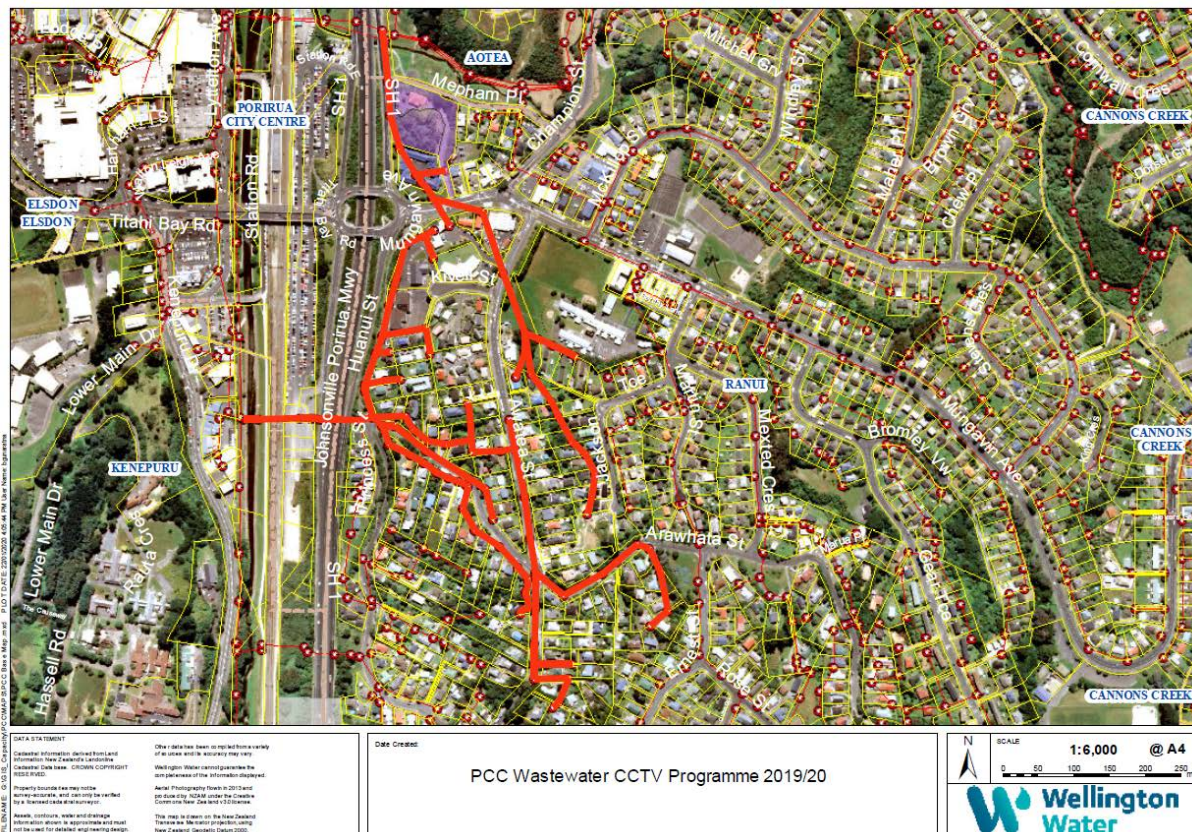
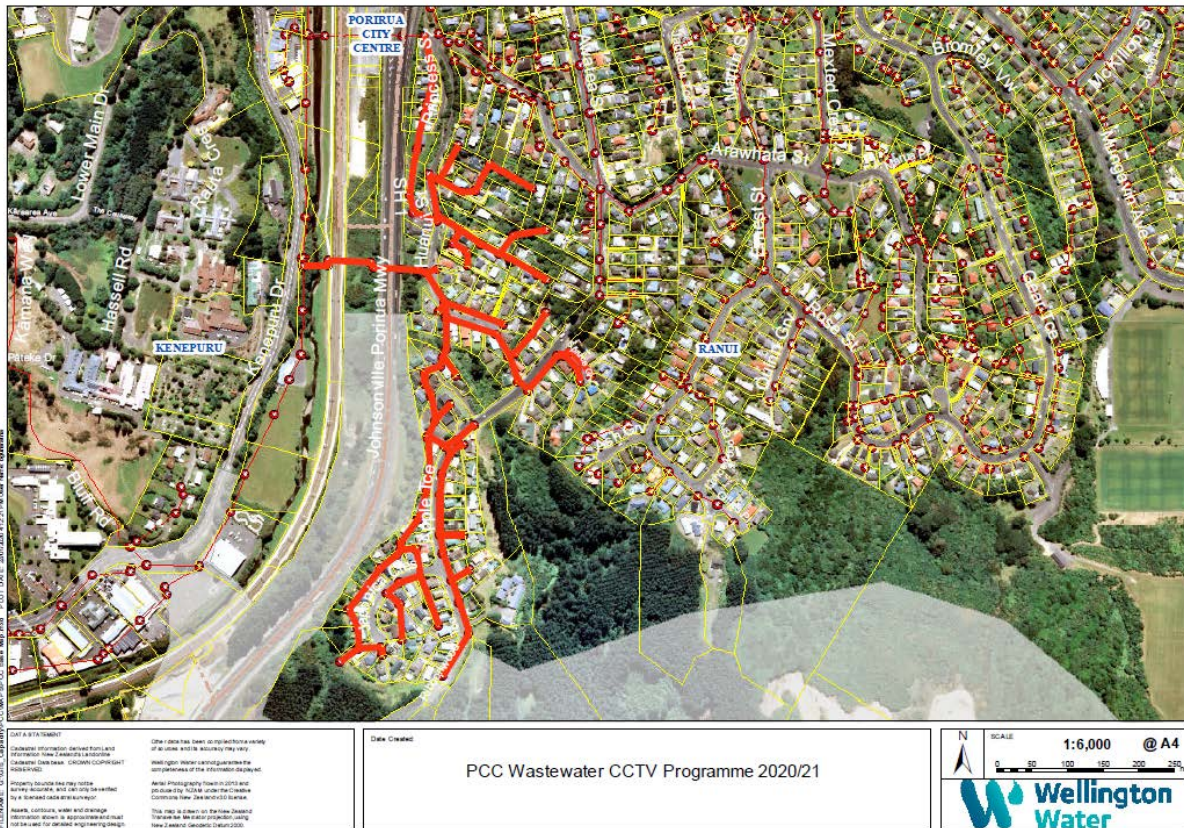


Figure 2 - Map of CCTV of Wastewater Mains planned for PCC in 2020-2021



Stormwater and Wastewater Capital Projects

The following table provides a summary of planned capital projects for wastewater and stormwater assets that were undertaken in 2019-2020 or scheduled for 2020-2021. Ongoing operational work such as investigations and reactive maintenance and renewals are also carried out in addition to the planned work listed below.

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

Activity	2019/2020	2020/2021
Stormwater	<ul style="list-style-type: none"> • Central Tawa Catchment Stormwater Improvements • SW Manhole Cover Improvements 	<ul style="list-style-type: none"> • Main Road (68-74) Tawa SW Improvement • SW Manhole Cover Improvements
Wastewater	<ul style="list-style-type: none"> • Titahi Bay WW Pipeline Renewal • WW Manhole Cover Improvements • Central City WW Storage Tank Design • WW JV Major Pump Station Renewals • Tangare Drive Pump Station Splitter Box Renewal 	<ul style="list-style-type: none"> • Plimmerton WW Renewals • Titahi Bay WW Pipeline Renewal • WW Manhole Cover Improvements • Duck Creek Pump Station wastewater storage tank • Tangare Drive Pump Station Splitter Box Renewal