Wellington Water

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Me Heke Ki Pōneke

Western Wastewater Treatment Plant

Annual Resource Consents Report 2020/2021

Your public water company

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Control Sheet

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Executive Summary

This report has been prepared on behalf of the Wellington City Council (WCC) for compliance with the following resource consents:

WGN060283[35255]

This coastal permit allows WCC to continuously discharge disinfected secondary (fully treated) effluent to the Wellington South Coast coastal marine area (Cook Strait in the vicinity of the Karori Stream Mouth) via an existing outfall. The map reference for the discharge location is NZMS 260: R27; 504.836.

WGN060283[25227]

This coastal discharge permit allows WCC to occasionally discharge milli-screened (partially treated) effluent to the Wellington South Coast marine area (cook Strait in the vicinity of the Karori Stream Mouth) via an existing outfall during significant wet weather events. The map reference for the discharge location is NZMS 260: R27; 504.836.

WGN060283[35674]

This discharge permit allows WCC to occasionally discharge secondary treated and disinfected wastewater from the Western Wastewater Treatment Plant to Karori Stream during events when the stormwater tank is full and the flow to the plant exceeds 190L/s. The map reference for the discharge location is NZMS 260: R27; 2652332.5987157.

WGN060283[35675]

This discharge permit allows WCC to occasionally discharge milli-screened and settled wastewater from the Western WWTP to Karori stream during events when the stormwater tank is full and the flow to the plant exceeds 390L/s. The map reference for the discharge location is NZMS 260: R27; 2652332.5987157.

WGN060283[25230]

This discharge permit allows WCC to discharge contaminants to air from the operation of the Western WWTP.

The report will cover the period from 1 July 2020 to 30 June 2021.

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Resource Consent

WGN060283[35255]

Effluent discharge from the Western WWTP is governed by the resource consent under the Greater Wellington Regional Council consent file number WGN060283 [35255]. In general, the consent allows the continuous discharge disinfected secondary (fully treated) effluent to the Wellington South Coast coastal marine area (Cook Strait in the vicinity of the Karori Stream Mouth) via an existing outfall. The following outlines the conditions of this resource consent required for this report.

WGN060283[25227]

In addition to the above resource consent, the discharge from the Western WWTP is governed by another resource consent under the Greater Wellington Regional Council consent file number WGN060283 [25227]. In general, the consent allows the occasional discharge of milli-screened (partially treated) effluent to the Wellington South Coast coastal marine area via an existing outfall during significant wet weather events. The following also outlines the conditions of this resource consent required for this report.

WGN060283[35674]

In addition to the above two (2) resource consents, the discharge from the Western WWTP is governed by another resource consent under the Greater Wellington Regional Council consent file number WGN060283 [35674]. In general, the consent allows the occasional discharge of secondary treated and disinfected wastewater from the Western WWTP to Karori Stream during events when the stormwater tank is full and the flow to the plant exceeds 190L/s. The following also outlines the conditions of this resource consent required for this report.

WGN060283[35675]

The fourth resource consent that governs the discharge from the Western WWTP is under the Greater Wellington Regional Council consent file number WGN060283 [35675]. In general, the consent allows for the occasional discharge of milli-screened and settled wastewater from the Western WWTP to Karori stream during events when the stormwater tank is full and the flow to the plant exceeds 390L/s. The following also outlines the conditions of this resource consent required for this report.

WGN060283[25230]

The final resource consent that governs the discharge from the Western WWTP is under the Greater Wellington Regional Council consent file number WGN060283 [25230]. In general, the consent allows the discharge of contaminants to air from the operation of the Western WWTP. The following also outlines the conditions of this resource consent required for this report.

WGN060283 [35255]

Condition (2)

The rate of discharge shall not exceed 200 litres per second (L/s) or 17, 280 cubic metres per day (m^3/day).

The daily dicharge volume from the WWTP and the pipeline is illustrated in Figure 1. Daily rainfall was also included to show the effect of wet weather events to the volume being discharged by the plant. It is evident that high discharge volumes occur when there is heavy rainfall in the catchment.

The rainfall data was taken from GWRC Environmental Monitoring and Research at Karori Stream Samuel Marsden School Site. Plant's flow data was taken from Veolia's system.

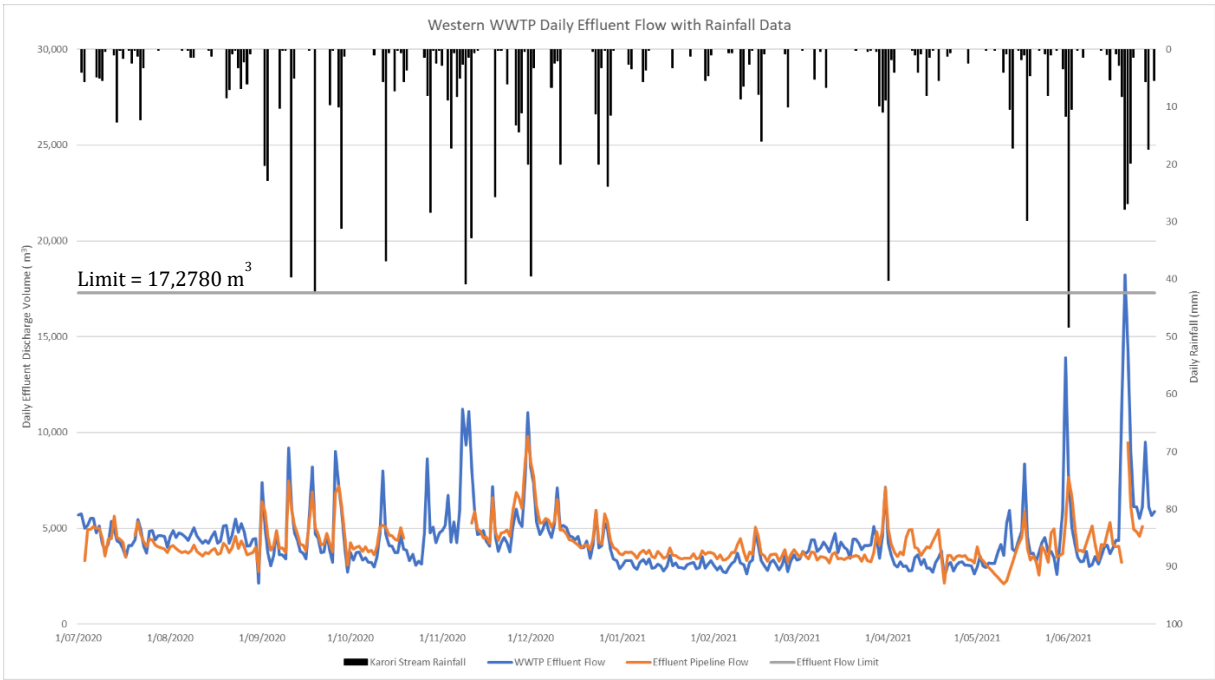


Figure 1: Western WWTP Effluent Flow versus Rainfall

Please note that the discharge limit specified in WGN060283 [35255], Condition (2) applies to the discharge from the effluent pipeline to the coastal marine area. It is not applicable to the discharge from the WWTP.

The values between the WWTP effluent flow and the effluent pipeline flow will not have the same values due to the following factors:

1. The distance between the two flow meters
2. The type and condition of the flow meters

It can be noted that although the values do not match, they trend with each other.

There are some missing effluent flow records from the outfall pipeline. The causes of which are summarized below:

July 2020 – there was no data for 1,2,18 and 19 July. The outfall pipeline flow meter gets its power supply from wind and solar. Poor weather conditions and a loose connection to the wind turbine caused the battery of the effluent pipeline flow meter to lose power. Without a continuous power supply, the flow meter loses its function for a few hours on sporadic days throughout the month.

October to November 2020 – there was no data for 20th October to 10th November. The Western WWTP outfall pipeline flow meter failed. An investigation was conducted the following day and Veolia discovered that the velocity meter on the flow meter had faulted. The procurement of the required replacement part took a month to arrive and was installed 11 November 2021. The new velocity meter was installed on 11 November 2021.No data is available from 20 October to 11 November 2021.

June 2021 – there were no data for 20, 27 to 30 June. On 20th June 2021, there was an issue with the battery. It had not charged properly so the unit lost power. The electrical team went out to replace the battery and restored power to the system. The flow meter then faulted on 27th June 2021. A voltage issue caused the flow meter to fault on a high setting. Due to the wet weather, it was a health and safety risk to travel down to the outfall to conduct repairs. When the weather cleared the electrical team were able to service the unit. They also programmed an automatic reset to clear any faults that may occur on the unit due to flow meter equipment failure.

Condition (5)

The permit holder shall establish a community liaison·group (CLG) which shall act as a forum for consultation and liaison with the community and be used as a vehicle to provide information regarding the Western Wastewater Treatment Plant. The permit holder shall invite persons with an interest in participating in the CLG from the following groups:

- representatives of local Tangata Whenua;
- neighbouring and downstream landowners;
- ., residents of South Karori Road;
- a representative from the Makara-Ohariu Community Board;
- a representative of the West Wellington Environmental Protection Society Inc;
- a representative of the permit holder; and
- a representative of the plant operator.

The permit holder may invite any other parties to attend.

A meeting of the CLG shall be held at least once every calendar year. Minutes of any CLG meetings held shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council and the permit holder shall report in writing to the Manager, Environmental Regulation, Wellington Regional Council, by 31 July each year on any consultation and activities undertaken with regard to the CLG. A copy of this report shall be forwarded to the CLG members.

Note: The permit holder shall not be in breach of this condition if, after taking all reasonable measures, and its best endeavours, it has not been possible to gain the requisite participation.

The Western WWTP community liaison group met on 9th September 2020. The minutes of the meeting were circulated to the group.

Condition (10)

The wastewater discharged from the Western Wastewater Treatment Plant to the South Coast shall comply with the following effluent quality criteria:

(i) BOD_5

The geometric mean of 20 consecutive sampling results taken in any calendar month shall not exceed 20g/m^3 and no more than two of those 20 sample results shall exceed 50g/m^3.

(ii) Suspended solids

The geometric mean of 20 consecutive sampling results shall not exceed 30g/m^3 and no more than two in any 20 consecutive sample results shall exceed 80g/m^3.

(iii) Faecal Coliforms

The geometric mean of 20 consecutive sampling results taken in any calendar month shall not exceed 200 colony forming units per 100mL and no more than two of those 20 sample results shall exceed 2,000 colony forming units per 100 mL.

Compliance with the effluent quality criteria shall be determined from the results of wastewater monitoring undertaken in accordance with conditions (9) (a) and (9) (b) of this permit.

Note: When the consent holder takes more than 20 samples during any calendar month, the geometric mean calculated for condition 10 must only be of the first 20 consecutive samples. All samples after the 20th sample in any calendar month shall be disregarded for the geometric mean calculation. All sample results are to be provided to Wellington Regional Council in the quarterly report required by condition 19.

Section (i)

Below is a summary of the geometric mean and % compliance for the Biological Oxygen Demand.

Date	Biological Oxygen Demand	
	Geometric Mean	%Compliance
	g/m^3	%
31 July 2020	12	95
31 August 2020	8	100
30 September 2020	5	100
31 October 2020	14	95
30 November 2020	10	90
31 December 2020	10	100
31 January 2021	18	95
28 February 2021	11	90
31 March 2021	74	15
30 April 2021	25	100
31 May 2021	38	55
30 June 2021	14	95
Limits	**20**	**90**

Table 1: Carbonaceous Biological Oxygen Demand Geometric Mean and % Compliance

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.

Effluent BOD was noncompliant for March, and May 2021. GWRC has been provided with investigation reports to explain these exceedances. Veolia is currently working on their performance plan to ensure the plant performance returns to compliance.

Section (ii)

Below is a summary of the geometric mean and percent compliance for the Suspended Solids.

Date	Suspended Solids	
	Geometric Mean	%Compliance
	g/m³	%
31 July 2020	13	95
31 August 2020	13	100
30 September 2020	7	100
31 October 2020	14	100
30 November 2020	16	90
31 December 2020	21	100
31 January 2021	34	70
28 February 2021	18	90
31 March 2021	178	5
30 April 2021	57	90
31 May 2021	75	50
30 June 2021	30	90
Limits	**30**	**90**

Table 2: Suspended Solids Geometric Mean and % Compliance

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.

Effluent suspended solids were noncompliant for January, March, April, and May 2021. GWRC has been provided with investigation reports to explain these exceedances. Veolia is currently working on their performance plan to ensure the plant performance returns to compliance.

Section (iii)

Below is a summary of the geometric mean and percent compliance for the Faecal Coliforms.

Date	Faecal Coliforms	
	Geometric Mean	% Compliance
	g/m³	%
31 July 2020	2	100
31 August 2020	5	100
30 September 2020	3	100
31 October 2020	20	100
30 November 2020	37	90
31 December 2020	86	95
31 January 2021	48	85
28 February 2021	139	95
31 March 2021	651	90

30 April 2021	60	100
31 May 2021	136	90
30 June 2021	19	100
Limits	**200**	**90**

Table 3: Faecal Coliforms Results, Geometric Mean, and % Compliance

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.

Effluent faecal coliform was noncompliant for January and March 2021. GWRC has been provided with investigation reports to explain these exceedances. Veolia is currently working on their performance plan to ensure the plant performance returns to compliance.

Condition (16)

The permit holder shall collect representative coastal water samples from knee deep water at the following locations, once each month for five months through November to March inclusive (the bathing season) each year, for the duration of this permit:

a) 100m SE of the outfall (map reference NZMS 260: R27; 504.835)
b) 200m SE of the outfall (map reference NZMS 260: R27; 504.834)
c) The Karori Stream, above the tidal influence
d) 100m NW of the mouth of the Karori Stream

Sampling shall be undertaken during dry, settled weather where practicable. Each of the water samples shall be analysed for faecal coliform and enterococci bacteria (cfu/100ml). The time of the sample collection, together with the weather and tidal conditions, observations of the sea state, stream colour and location of stream mouth (if at all) shall be recorded and reported with the analytical results.

Water samples taken during the months of January to March inclusive, shall also be analysed for the following parameters:

Ammoniacal nitrogen	g/m^3
Nitrite nitrogen	g/m^3
Nitrate nitrogen	g/m^3
Dissolved reactive phosphorus	g/m^3

The permit holder shall provide the results to the Manager, Environmental Regulation, Regional Council, by 30 April each year (as part of the quarterly report required by condition (19) of this permit), or on request.

Following is a summary of the analytical results for the November to March monthly coastal water samples.

Date	Karori Stream above Tidal Influence									100m North West of Karori Stream Mouth								
	Enterococci	Faecal Coliforms	Ammoniacal Nitrogen	Nitrite Nitrogen	Nitrate Nitrogen	Dissolved Reactive Phosphorus	Colour of Stream	Location of Stream Mouth	Weather	Enterococci	Faecal Coliforms	Ammoniacal Nitrogen	Nitrite Nitrogen	Nitrate Nitrogen	Dissolved Reactive Phosphorus	Sea Conditions	Tide	Weather
dd/mm/ yyyy	100cfu/mL	100cfu/mL	g/m^3	g/m^3	g/m^3	g/m^3	--	--	--	100cfu/mL	100cfu/mL	g/m^3	g/m^3	g/m^3	g/m^3	--	--	--
24/11/2020	100	300	N/A	N/A	N/A	N/A	Clear	Beside Outfall	Overcast	200	150	N/A	N/A	N/A	N/A	Mid	Flood	Overcast
16/12/2020	3.6	390	N/A	N/A	N/A	N/A	Clear	Beside Outfall	Cloudy	1.8	1.8	N/A	N/A	N/A	N/A	High	Ebb	Cloudy
28/01/2021	46	50	0.4	0.002	0.35	0.022	Clear	Beside Outfall	Overcast	3.6	1.8	0.4	0.002	0.14	0.08	High	Ebb	Overcast
25/02/2021	5.5	15	0.4	0.002	0.68	0.081	Clear	Beside Outfall	Overcast	1.8	1.8	0.4	0.002	0.2	0.081	Mid	Ebb	Overcast
17/3/2021	29	1.8	4	0.002	0.9	0.084	Clear	Beside Outfall	Clear	3.6	5.5	0.4	0.004	0.11	0.026	High	Flood	Clear

Date	100m South East of Western Outfall									200m South East of Western Outfall								
	Enterococci	Faecal Coliforms	Ammoniacal Nitrogen	Nitrite Nitrogen	Nitrate Nitrogen	Dissolved Reactive Phosphorus	Sea Conditions	Tide	Weather	Enterococci	Faecal Coliforms	Ammoniacal Nitrogen	Nitrite Nitrogen	Nitrate Nitrogen	Dissolved Reactive Phosphorus	Sea Conditions	Tide	Weather
dd/mm/yyyy	100cfu/mL	100cfu/mL	g/m³	g/m³	g/m³	g/m³	--	--	--	100cfu/mL	100cfu/mL	g/m³	g/m³	g/m³	g/m³	--	--	--
24/11/2020	150	90	N/A	N/A	N/A	N/A	Mid	Flood	Overcast	150	100	N/A	N/A	N/A	N/A	Mid	Flood	Overcast
16/12/2020	1.8	1.8	N/A	N/A	N/A	N/A	High	Ebb	Cloudy	3.6	1.8	N/A	N/A	N/A	N/A	High	Ebb	Cloudy
28/01/2021	1.8	1.8	0.475	0.002	0.064	0.02	High	Ebb	Overcast	3.6	1.8	0.4	0.002	0.35	0.022	High	Ebb	Overcast
25/02/2021	1.8	1.8	0.4	0.002	0.067	0.064	Mid	Ebb	Overcast	1.8	1.8	0.4	0.002	0.098	0.032	Mid	Ebb	Overcast
17/3/2021	9.1	3.6	0.4	0.0033	0.071	0.07	High	Flood	Clear	1.8	5.5	0.4	0.0035	0.073	0.019	High	Flood	Clear

Table 4: Quarterly Effluent Sample Results

Condition (20)

The permit holder shall provide to the Manager, Environmental Regulation, Wellington Regional Council an Annual Assessment and Analysis Report for the period 1 July to 30 June by 31 July each year summarising compliance with the conditions of this permit. This report shall include, but not be limited to the following:

a) A summary of all monitoring undertaken in accordance with the conditions of this permit and a critical analysis of the information in terms of compliance and adverse environmental effects;
b) A comparison of data with previously collected data in order to identify any emerging trends;
c) Comments on compliance with the conditions of this permit;
d) Any reasons for non-compliance or difficulties in achieving compliance with the conditions of this permit;
e) Any measures that have been undertaken to improve the environmental performance of the wastewater treatment and disposal system;
f) Any other issues considered to be important;

Section (a)

Table 5 summarises all the treatment plant data monitored from July 2020 to June2021. The median, minimum and maximum values are tabulated for each parameter.

Parameter	Units	Geomean Limit	N	Minimum	Median	90th Percentile	Maximum
WWTP Effluent Discharge	m^3	-	365	2,142	4,070	5,906	18,209
WWTP Effluent Outfall Pipeline Discharge	m^3	17,280	334	2,092	3,959	5,324	9,803
Effluent BOD	g/m^3	20	365	1	15	64	300
Effluent Suspended Solids	g/m^3	30	365	3	23	130	460
Effluent Faecal Coliform	cfu/100mL	200	365	2	36	782	90,000

Table 5: Summary of WWTP Monitoring Data

The discharge volume in the outfall pipeline is within the compliance limit for the reporting period. As shown in Figure 1, wet weather events greatly affect the discharge volume of the plant.

The median values of all the daily effluent quality parameters such as BOD, suspended solids and faecal coliform are within the geomean limits. An effluent dispersion study by Cawthron Institute in 2005 showed that the " worst case " estimate of dilution at the edge of the 100-metre mixing zone is 50:1. Using the 90th percentile value of the effluent faecal coliform and a background concentration of 5 cfu/100mL, the receiving water 100m from the outfall is estimated to have a faecal

concentration of 21 cfu/100 mL. This estimated value is way lower than the bathing season limit for faecal coliform of 150 cfu/100 mL.

The average values for the receiving water monitoring for this reporting period are tabulated in Table 6.

Parameter	100m SE of the Outfall	200m SE of the Outfall	The Karori Stream, Above the Tidal Influence	100m NW of the Mouth of the Karori Stream
Enterocci	33	32	37	42
Faecal Coliform	20	22	151	32
Ammoniacal Nitrogen	0.4	0.4	1.6	0.4
Nitite Nitrogen	0.002	0.003	0.002	0.003
Nitrate Nitrogen	0.067	0.174	0.643	0.15
Dissolve Reactive Phosporus	0.051	0.023	0.062	0.062

Table 6: Summary of Receiving Environment Monitoring Data

The average enterococci and faecal coliform values for both 100m and 200m SE of outfall is well below the bathing season limit which is 35 cfu/100 mL and 150 cfu/100mL respectively. This signifies that the effluent discharge from the treatment plant effect on the receiving water body's microbial quality is less than minor.

Section (b)

A comparison of data was made between the last five financial years. The following section summarises that comparison.

WWTP Effluent Discharge Volume:

Due to some missing data in the outfall effluent pipeline daily discharge volumes, WWTP effluent discharge volume is used to establish a trend. Rainfall data from GWRC site is compared with the WWTP effluent daily discharge volume. In figure 2, it can be noted that the plant's effluent discharge volume is greatly affected by wet weather.

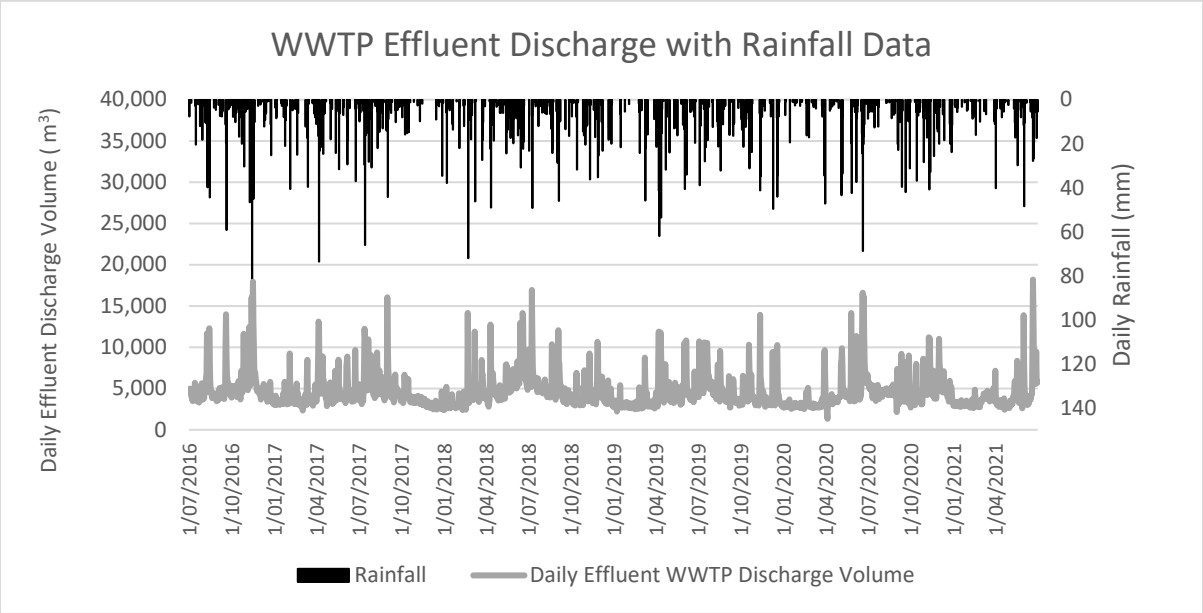


Figure 2: WWTP Effluent Discharge Volume versus Rainfall

WWTP Effluent BOD_5:

To establish a trend, all daily effluent BOD_5 in the last five (5) years have been used. Please note that only the first 20 samples of each calendar month are used to assess compliance as stated in the resource consent. The consent does not require daily effluent sampling thus there are some days with missing effluent BOD_5 results in the past years.

In figure 3, it can be noted that the daily effluent BOD_5 was consistent until April 2020 when an increase in daily values can be seen. Veolia have provided investigation reports to GWRC to explain theses exceedances. Wellington Water and Veolia are currently working on their performance plan to ensure the plant performance returns to compliance.

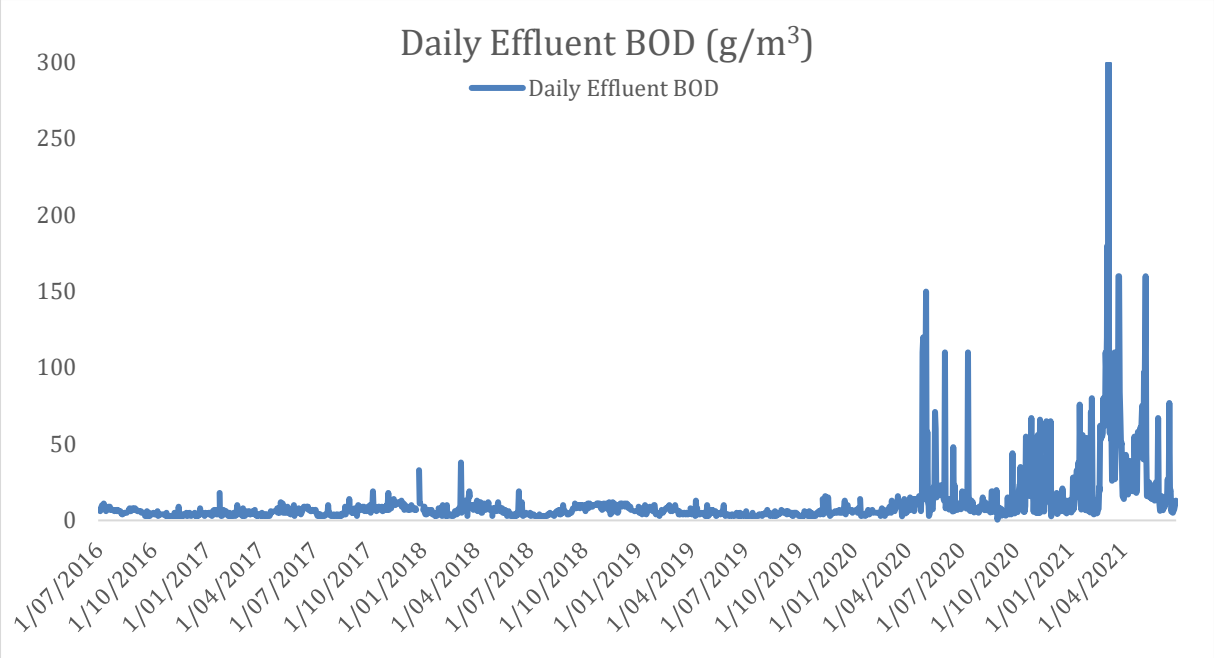


Figure 3: Daily Effluent BOD_5 results

WWTP Effluent Suspended Solids:

To establish a trend, all daily effluent suspended solids in the last 5 years have been used. Please note that only the first 20 samples of each calendar month are used to assess compliance as stated in the resource consent. The consent does not require daily effluent sampling thus there are some days with missing effluent suspended solids results in the past years.

In figure 4, it can be noted that the daily effluent suspended solids was consistent until April 2020 when an increase in daily values can be seen. Veolia have provided investigation reports to GWRC to explain theses exceedances. Wellington Water and Veolia are currently working on their performance plan to ensure the plant performance returns to compliance.

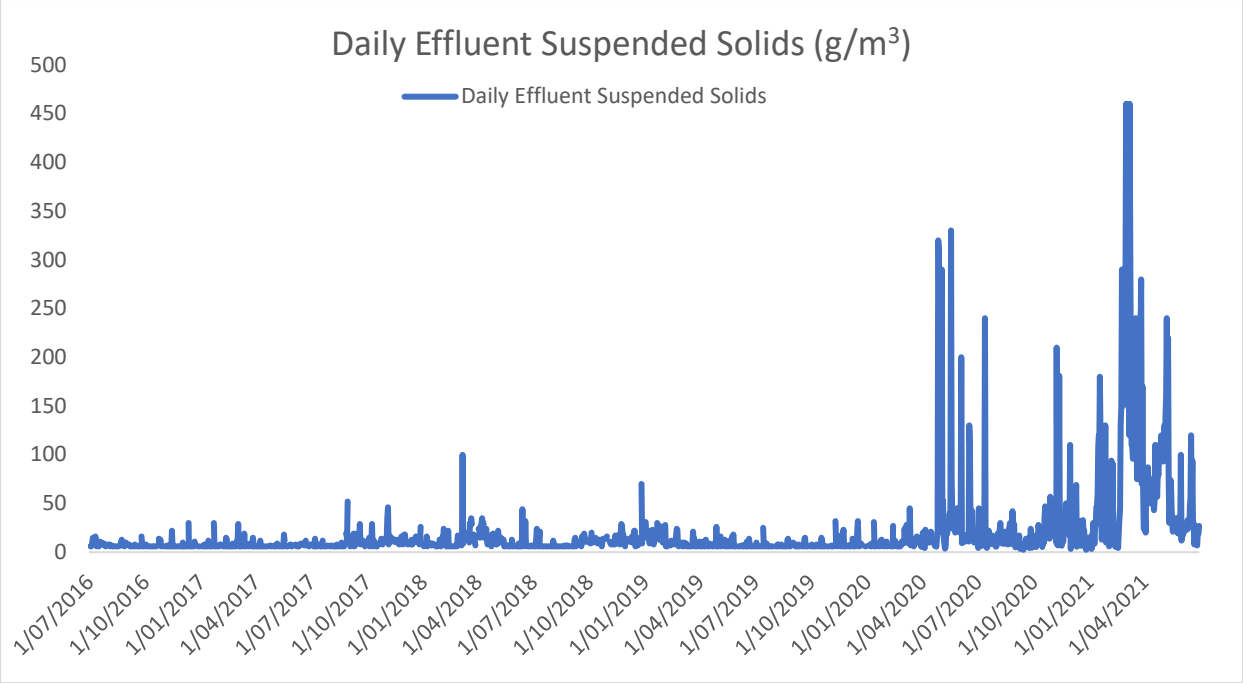


Figure 4: Daily Effluent Suspended Solids Results

WWTP Effluent Faecal Coliform:

To establish a trend, all daily effluent suspended solids in the last 5 years have been used. Please note that only the first 20 samples of each calendar month are used to assess compliance as stated in the resource consent. The consent does not require daily effluent sampling thus there are some days with missing effluent suspended solids results in the past years.

In figure 5, it can be noted that the daily effluent faecal coliform was consistent until April 2020 when an increase in daily values can be seen. There are some isolated spikes in the previous years but this can be associated with wet weather events. As UV disinfection is dependent in the quality of the effluent, high suspended solids content in the effluent would cause a decrease in disinfection efficiency. Veolia have provided investigation reports to GWRC to explain theses exceedances. Wellington Water and Veolia are currently working on their performance plan to ensure the plant performance returns to compliance.

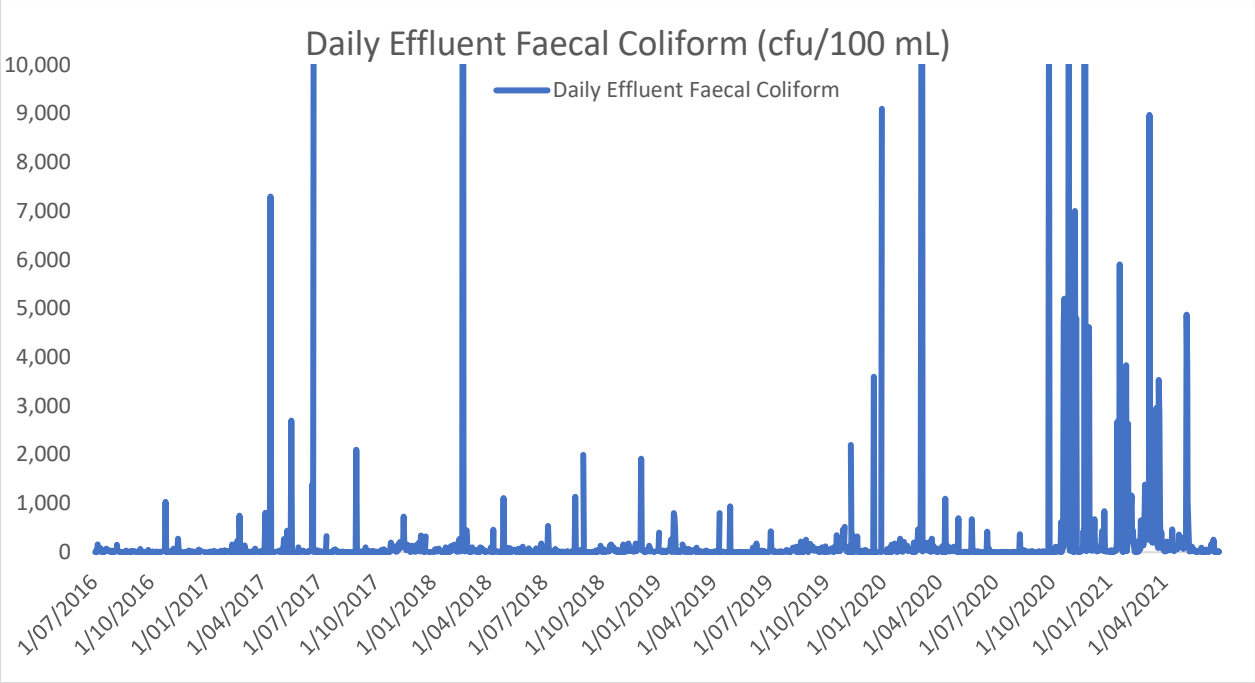


Figure 5: Daily Effluent Faecal Coliform Results

The following is a comparison of the monthly coastal waters samples between the previous and current reporting period:

Parameter	Units	Karori Stream above Tidal Influence					100m North West of Karori Stream Mouth					100m South East of Western Outfall					200m South East of Western Outfall				
		2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021
Enterococci	**cfu/100mL**	6	501	48	19.2	37	5	23	8	5.6	42	6	12	4	4.8	33	4	23	40	5.6	32
Faecal Coliforms	**cfu/100mL**	15	294	134	74.8	151	7	10	10	5.6	32	4	7	4	4	20	4	30	13	8.8	22
Ammoniacal Nitrogen	**g/ m^3**	0.690	0.010	0.015	0.17	1.6	0.760	0.010	0.010	0.06	0.4	0.890	0.020	0.017	0.04	0.4	0.790	0.020	0.020	0.04	0.4
Nitrite Nitrogen	**g/ m^3**	0.010	0.010	0.010	0.4333	0.002	0.040	0.100	0.100	0.4	0.003	0.010	0.100	0.100	0.4	0.002	0.030	0.100	0.100	0.4	0.003
Nitrate Nitrogen	**g/ m^3**	0.0100	0.7200	0.4500	0.2	0.643	0.0800	0.1300	0.1300	0.09	0.15	0.0830	0.0700	0.1000	0.1	0.067	0.0800	0.0900	0.1000	0.1	0.174
Dissolved Reactive Phosphorus	**g/ m^3**	0.0390	0.0300	0.0310	0.022	0.062	0.0320	0.0200	0.0200	0.0187	0.062	0.0240	0.0200	0.0240	0.0163	0.051	0.0250	0.0200	0.0320	0.0173	0.023

Table 7: Coastal Monitoring

The results were consistent throughout the 5 year period.

Section (c)

Western WWTP was not able to consistently meet its compliance requirement for this reporting period. Veolia have received an infringement notice while Wellington Water have received a formal warning for January to March 2021 non-compliant effluent quality. Both parties are currently working on to improve the performance of the plant.

Section (d)

Veolia's investigation reports regarding the non-compliances indicated that the cause of these exceedances can be attributed to several factors such as:

- Plant's process control of the hydraulic flow
- Seasonal fluctuation of hydraulic and organic loading

Section (e)

Wellington Water and Veolia currently review the operation of the treatment plant to ensure the continuous improvement of its environmental performance.

Section (f)

Wellington Water clarified with GWRC regarding the interpretation of WGN060283 [35255] condition 10 and 11 last May 2021. The following actions have been agreed upon:

- The assessment of compliance to condition 10 needs to be assessed in accordance to condition wording regardless of the compliance assessment in the past. This would result to omission of the 95th percentile assessment in the effluent quality compliance.
- In condition 11, exceedance of the geometric mean limit will trigger the notification to GWRC.

Condition (23)

The permit holder shall submit an annual report for the main outfall pipeline, which addresses activities undertaken during the previous year, to the Manager, Environmental Regulation, Wellington Regional Council and members of the CLG, by 31 July each year.

This report shall include, but not be limited to, the following elements:

a) details of the location, extent and duration of any leakage or faults, and the timing, nature and success of remedial action taken to remedy the leaks or faults;
b) details of any other works (including any repairs and replacements) undertaken during the past year; and
c) any work planned in the next 12 months to repair or replace the pipeline.

On 29th July, GWRC have agreed that the Western WWTP outfall pipeline report can be submitted latest by 16th August,2021 . The reason for the delay has been communicated to GWRC. Thus, appendix iii won't have the usual outfall pipeline annual report.

Condition (25)

The permit holder shall collect representative water samples from the Karori Stream at the following locations, once every fortnight for the duration of this permit:

a) Karori Stream at Friend Street (map reference NZMS 260: R27; 554.901)
b) Karori Stream at Campbell Street (map reference NZMS 260: R27; 554.900)
c) Karori Stream at South Karori Road (map reference NZMS 260: R27; 540.880)
d) Karori Stream approximately 100 metres upstream of the Western Treatment Plant (map reference NZMS 260: R27; 523.872)
e) Karori Stream 100 metres approximately downstream of the Western Treatment Plant (map reference NZMS 260: R27; 523.871)

The water samples shall be analysed for faecal coliforms (cfu/100mL). The time of the sample collection, together with the weather conditions shall be recorded and reported with the analytical results.
The permit holder shall provide the results of this monitoring to the Manager, Environmental Regulation, Wellington Regional Council, quarterly, in accordance with the requirements of condition (19) of this permit, or on request.

The Karori Stream monitoring records can be found in Appendix v of this report.

WGN060283 [25227]

Condition (2)

This permit shall only be exercised when the sewage inflow to the treatment plant exceeds 190 litres per second (L/s), and the 1000 m^3 storage tank is full.

There were six bypass events that discharge partially treated effluent to Cook Strait via an existing outfall that occurred in the 2020/2021 reporting year. These events had an influent flow rate to the Western WWTP greater than 190L/s and the 1000m^3 storage tank was full. This resource consent can be applied

Condition (5)

The permit holder shall monitor and record the time, flow rate, duration and total volume of the bypass discharges into the coastal marine area, and shall report the results to the Manager, Environmental Regulation, Wellington Regional Council, within 10 working days of the overflow event occurring.

The permit holder shall maintain an incident log containing the details of each bypass discharge and make it available to the public or the Manager, Environmental Regulation, Wellington Regional Council upon request.

The following is a summary of the bypass events from the Western WWTP for the 2020/2021 reporting period. The discharge letters can be found in appendix vi of this report.

Date	Duration	Average Discharge Flow Rate	Max Discharge Flow Rate	Total Volume of Bypass	Consented	Cause
dd mmm yyyy	hrs/mins	L/s	L/s	m^3	Y/N	--
10 Sep 2020	02hr 37m	43	98	412	Y	Storm Event
27 Sep 2020	01hr 48m	33	63	213	Y	Storm Event
08 Nov 2020	05hr 15m	131	224	2,480	Y	Storm Event
10 Nov 2020	03hr 11m	74	155	853	Y	Storm Event
30 Nov 2020	05hr 46m	125	171	2,598	Y	Storm Event
31 May 2021	14hr 00m	52	168	832	Y	Storm Event

Table 8: Coastal Marine Area Bypass Events from 2020/2021 Reporting Period

Condition (6)

The permit holder shall submit to the Manager, Environmental Regulation, Wellington Regional Council the amount of rainfall recorded in each hour at Karori Reservoir rain-gauge for each of the 7 days preceding each overflow event in the annual report required by condition (10) of this permit.

The bypass events occurred on several days during the reporting period. The following tables are of the hourly rainfall rate for the seven days prior to the overflow events. All rainfall data is obtained from the GWRC Environmental Monitoring and Research website. The original rain gauge used was Karori Stream at Duthie Street. This site was decommissioned in 2020. The current rain gauge used is Karori Sream at Samuel Marsden School. A graphical representation of the plant's maximum hourly inflow versus the hourly rainfall data are shown for all the bypass discharge events. It can be noted that the plant's inflow is greatly affected by inflow and infiltration in the catchment especially during wet weather events.

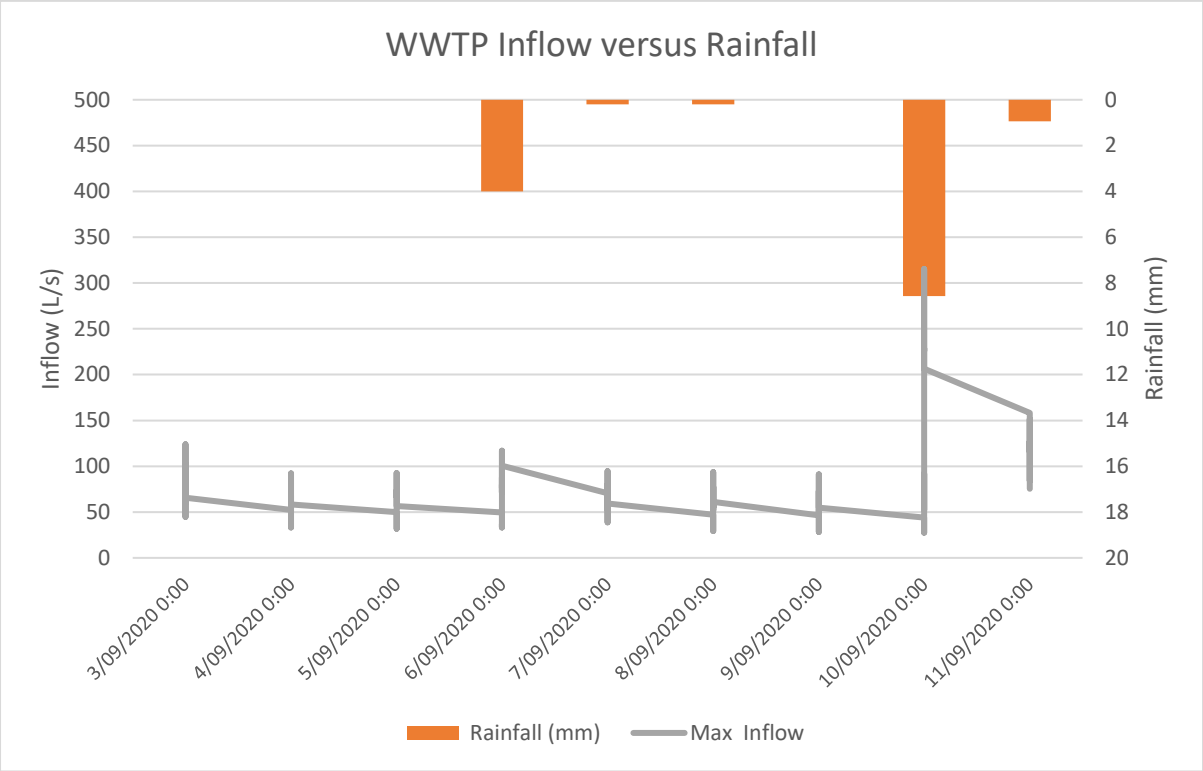


Figure 6: Rainfall and Max Inflow Data for 7 days prior 10/09/2020 Bypass Event

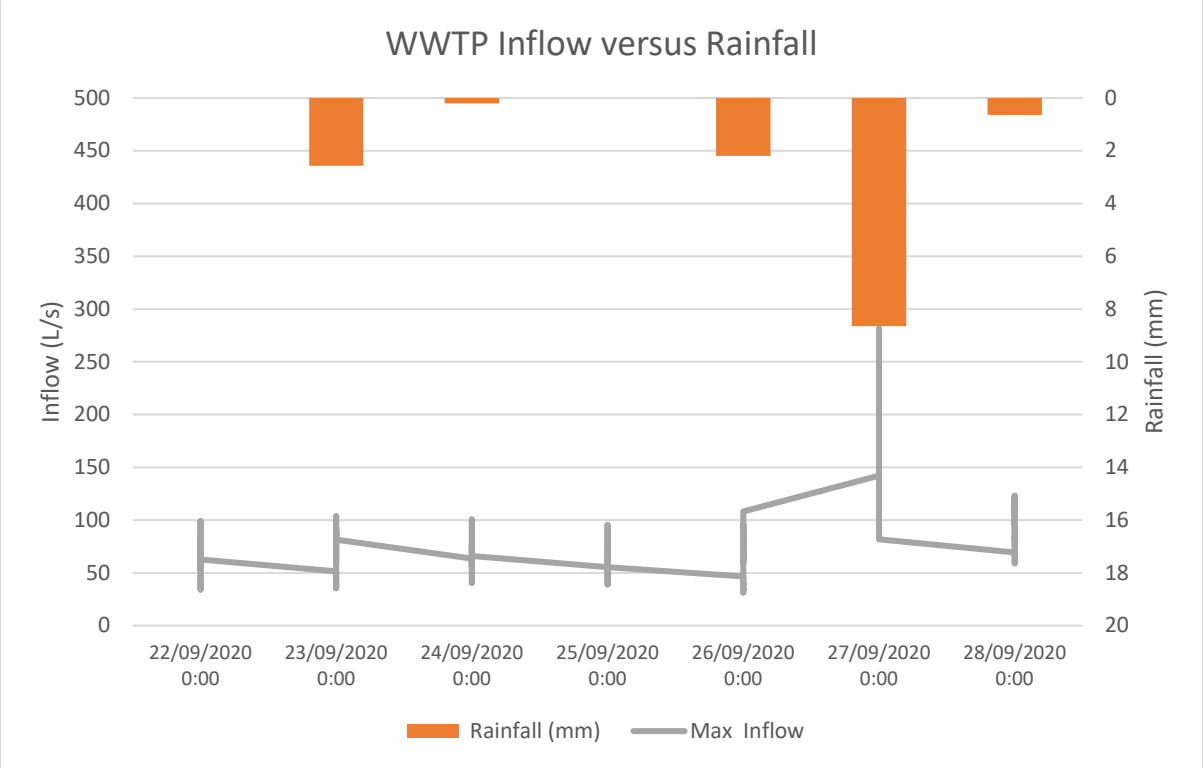


Figure 7: Rainfall and Max Inflow Data for 7 days prior 27/09/2020 Bypass Event

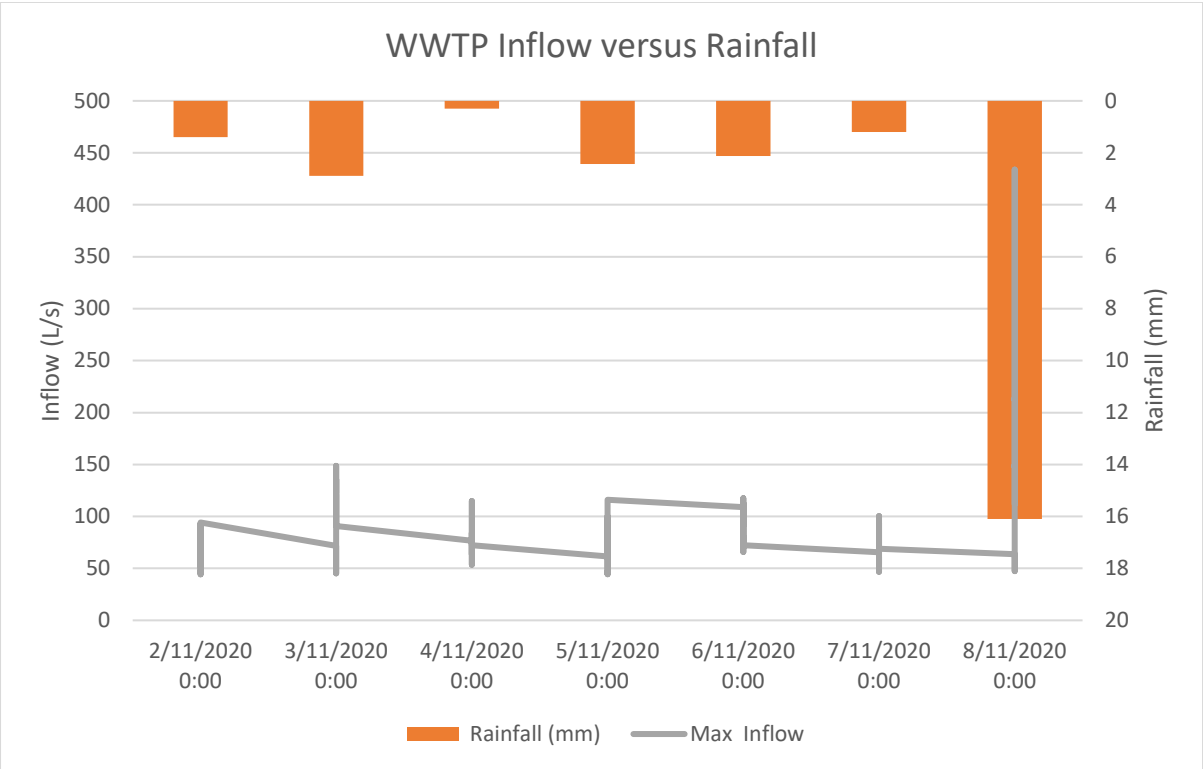


Figure 8: Rainfall and Max Inflow Data for 7 days prior 8/11/2020 Bypass Event

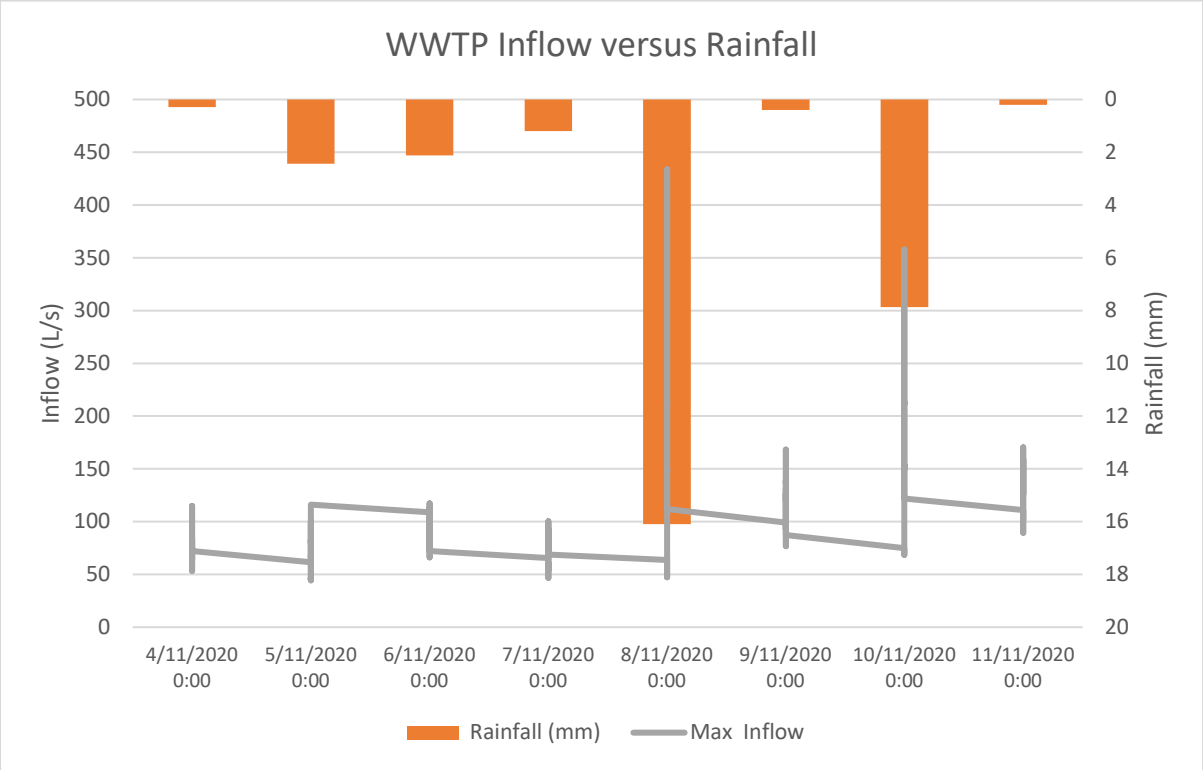


Figure 9: Rainfall and Max Inflow Data for 7 days prior 10/11/2020 Bypass Event

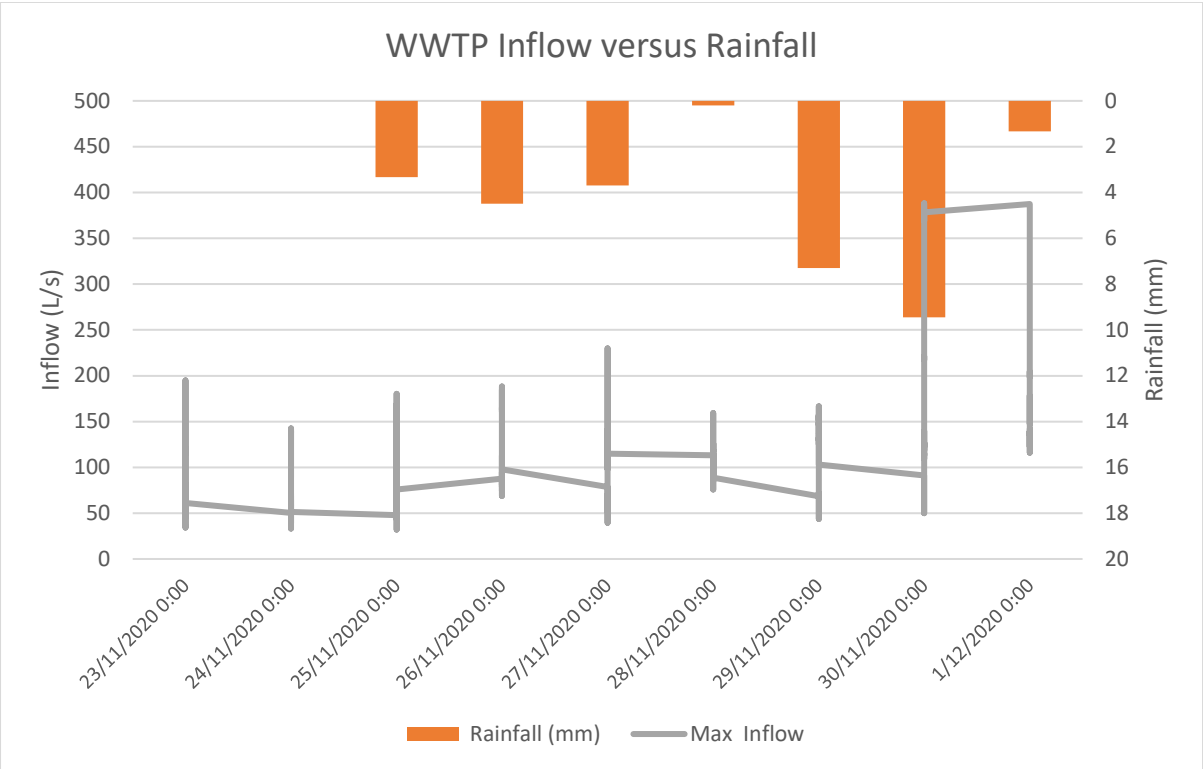


Figure 10: Rainfall and Max Inflow Data for 7 days prior 30/11/2020 Bypass Event

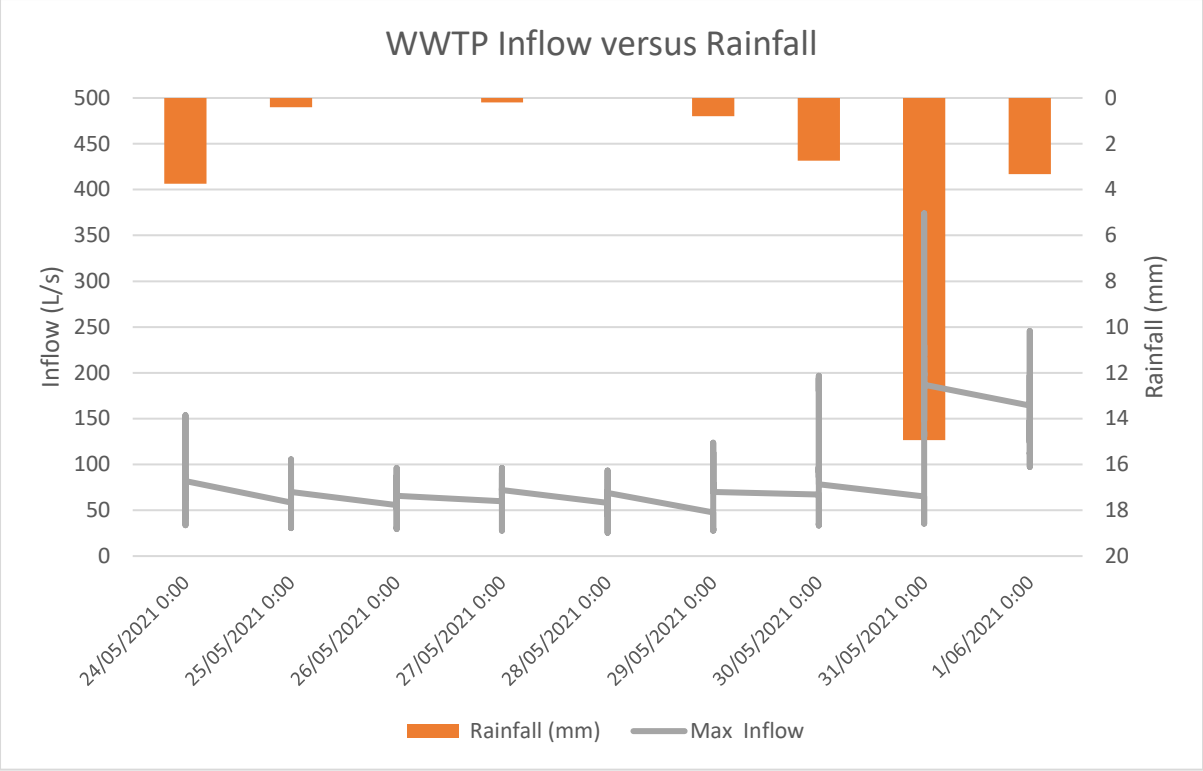


Figure 11: Rainfall and Max Inflow Data for 7 days prior 31/05/2021 Bypass Event

Condition (7)

The permit holder shall take one representative grab sample of the settled, milli-screened effluent prior to its entry into the coastal outfall pipe every time the discharge authorised by this permit has occurred for more than two hours. Each sample shall be analysed for the following parameters:

pH	
Suspended solids	g/m^3
Total BOD_5	g/m^3
Faecal coliform	cfu/100mL
bacteria oils/grease	g/m^3

The results of the monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of the bypass discharge occurring.

Five bypass events exceeded the two (2) hour limit specified in this condition. Therefore, samples were required. Below is a summary of the results obtained from the sample analysis:

Date	pH	Suspended Solids	Total BOD5	Faecal Coliform Bacteria	Oils/Grease
	--	g/m^3	g/m^3	cfu/100mL	g/m^3
11/09/2020	7	53	45	600,000	9
8/11/2020	6.6	280	170	1,400,000	24.8
11/11/2020	7.2	130	67	2,900,000	24.4
1/12/2020	6.8	28	19	310,000	15
31/05/2020	7.1	29	17	330,000	6.8

Table 9: Bypass Sample Analysis

The analytical data sheets for these samples can be found in the quarterly reports.

Condition (8)

When a bypass discharge occurs that lasts for longer than 10 hours the permit holder shall collect two sets of representative water samples from knee deep water at the following locations:

a) 100m SE of the outfall (map reference NZMS 260: R27; 504.835)
b) 200m SE of the outfall (map reference NZMS 260: R27; 504.834)
c) The Karori Stream, above the tidal influence
d) 100m NW of the mouth of the Karori Stream

The first set of samples shall be taken within 24 hours of the discharge commencing and the second set of samples shall be taken 12- 48 hours after the discharge has ceased.

These samples shall only be taken provided that safe vehicular access is available and weather conditions allow for safe access to the sample locations.

The water samples shall be analysed for enterococci bacteria (cfu/100ml). The time of the sample collection, together with the weather and tidal conditions shall be recorded and reported with the analytical results.

The results of the monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of the bypass discharge occurring.

Although the duration between the start and end of 31 May, 2021 bypass discharge was more than 10 hours. The discharge was intermittent; thus, shoreline sampling was not initiated.

Condition (12)

The permit holder shall provide the Manager, Environmental Regulation, Wellington Regional Council with an annual report detailing what steps have and will be taken to reduce infiltration and stormwater ingress into the Karori sewerage network.

The report shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council by 31 July each year and shall include, but not be limited to, the following information:

a) Details of works that have been undertaken and what these works are expected to achieve;
b) An indication of when any ongoing works will be completed;
c) Details of any investigations undertaken with regard to inflow and infiltration in the Karori catchment; and
d) Details of any works or investigations planned for the next financial year.

Note: One annual inflow and infiltration report may be submitted to the Manager, Environmental Regulation, Wellington Regional Council to meet the requirements in this regard of permits WGN060283 [25226], [25227], [35674] and [25229].

An annual inflow and infiltration report can be found in Appendix iv.

Condition (13)

The permit holder shall keep a record of any complaints that are received. The record shall contain the following details, where practicable:

a) Name and address of the complainant;
b) Identification of the nature of the complaint;
c) Date and time of the complaint and of the alleged event;
d) Weather conditions at the time of the complaint; and
e) Any measures taken to address the cause of the complaint.

The permit holder shall notify the Manager, Environmental Regulation, Wellington Regional Council of any complaints relating to the exercise of this permit, within twenty-four hours of being received by the permit holder or the next working day.

The permit holder shall forward to the Manager, Environmental Regulation, Wellington Regional Council a copy of any complaints recorded in the annual report required by condition (10) of this permit.

There were no complaints during the 2020/2021 reporting period.

WGN060283 [35674]

Condition (2)

This permit shall only be exercised when the sewage inflow to the treatment plant exceeds 190 litres per second (L/s), and the 1000 m^3 storage tank is full.

There were seven bypass events that discharged fully treated effluent to the Karori stream that occurred in the 2020/2021 reporting year. These events had an influent flow rate to the Western WWTP greater than 190L/s and the 1000m^3 storage tank was full except for 18th Sept unconsented discharge.

GWRC have been provided with the investigation report regarding the unconsented discharge. In summary, the discharge was caused by an operational error during the emptying of the storm tank. GWRC had issued a formal warning in response to this incident.

Condition (6)

The permit holder shall monitor and record the time, flow rate, duration and total volume of the overflow discharges into the Karori Stream, and shall report the results to the Manager, Environmental Regulation, Wellington Regional Council, within 10 working days of the overflow event occurring.

The permit holder shall maintain an incident log containing the details of each overflow discharge and make it available to the public or the Manager, Environmental Regulation, Wellington Regional Council upon request.

The following is a summary of the bypass events from the Western WWTP for the 2020/2021 reporting period. There was an unconsented discharge on the 18th September due to operational error. Veolia have provided GWRC with investigation report and have issued a formal warning in response to the incident.

Date	Duration	Average Flow to Stream Rate	Maximum Flow Rate to Stream	Total Volume of Bypass to Stream	Consented	Cause
dd mmm yyyy	hrs/mins	L/s	L/s	m^3	Y/N	--
10 Sep 2020	02hr 37m	10	27	86	Y	Storm event.
18 Sep 2020	03hr 01m	5	8	50	N	Operational Error
27 Sep 2020	01hr 48m	3	14	58	Y	Storm event.
08 Nov 2020	05hr 15m	38	69	715	Y	storm event
10 Nov 2020	03hr 11m	21	41	231	Y	storm event
30 Nov 2020	05hr 46m	32	44	663	Y	Storm event.
31 May 2021	14hr 00m	15	36	170	Y	Storm event.

Table 10: Karori Stream Bypass Events from 2020/2021 Reporting Period

Condition (7)

The permit holder shall submit to the Manager, Environmental Regulation, Wellington Regional Council the amount of rainfall recorded in each hour at Karori Reservoir rain-gauge for each of the 7 days preceding each overflow event in the annual report required by condition (11) of this permit.

For all the consented discharges' rainfall data please refer to WGN080003 [25227] Condition (6).

Figure 12 shows the rainfall data for the unconsented discharge in 18th September versus the maximum hourly inflow. It can be noted that the plant experienced a rainfall event on the 18th but the Storm tank was not full.

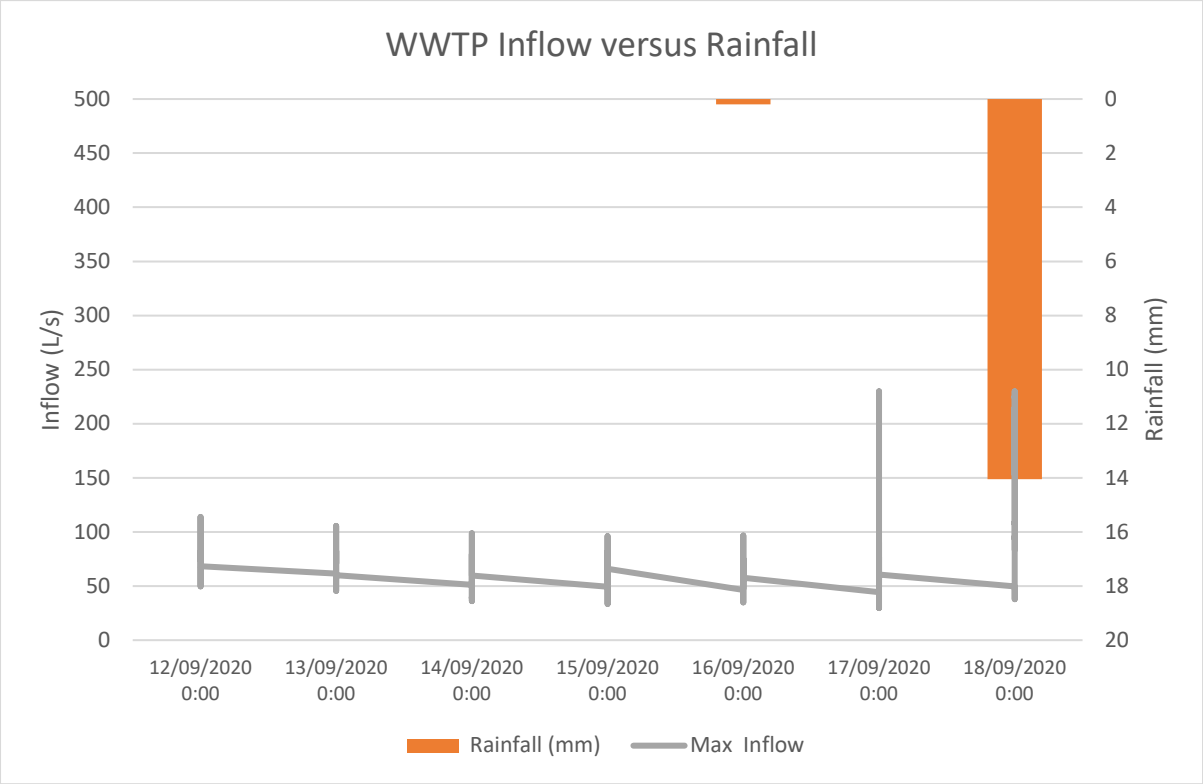


Figure 11: Rainfall and Max Inflow Data for 7 days prior 18th September Bypass Event

Condition (8)

After an overflow discharge has occurred for more than 2 hours, the permit holder shall collect a representative grab sample of the treated effluent, prior to its entry into Karori Stream. All samples shall be analysed for the following parameters:

Suspended solids	g/m^3
Ammoniacal nitrogen	g/m^3
Total BOD_5	g/m^3
Faecal coliform	cfu/100mL

The results of the monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of the bypass discharge occurring.

Six events during the 2020/2021 reporting year exceeded the two (2) hour limit stated in this condition. Therefore, these samples were required. Below is a summary of the analytical results from the samples:

Date	Suspended Solids	Ammoniacal Nitrogen	BOD_5	Faecal Coliforms
	g/m^3	g/m^3	g/m^3	cfu/100mL
11/09/2020	13	1.4	3.7	11
18/09/2020	8.7	11	4.7	1.6
8/11/2020	440	8.7	210	390,000
10/11/2020	10	3.9	8.7	11,000
1/12/2020	20	0.25	14	3,300
31/05/2020	200	5.1	170	29,000

Table 1: Western WWTP Treated Effluent Sample Results

The analytical data sheets can be found in the quarterly reports.

Condition (9)

After an overflow discharge has occurred for more than 24 hours, the permit holder shall collect two representative grab samples from the Karori Stream, one from upstream of the discharge point and one no more than 100 metres downstream of the discharge point. This sampling shall be repeated at daily intervals thereafter for the duration of the discharge. A final set of samples shall be taken two hours after the discharge has ceased, or as soon as is practicable thereafter.

All samples shall be analysed for the following parameters:

Suspended solids	g/m^3
Ammoniacal nitrogen	g/m^3
Total BOD_5	g/m^3
Faecal coliform	cfu/100mL

The results of the monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of the bypass discharge occurring.

Note: No monitoring shall be required during the hours of darkness, or when conditions are too dangerous for the safe procurement of samples.

All discharge events were less than 24 hours so this requirement is not needed for the report.

Condition (15)

The permit holder shall provide the Manager, Environmental Regulation, Wellington Regional Council and the members of the Community Liaison Group with an annual report detailing what steps have and will be taken to reduce infiltration and stormwater ingress into the Karori sewerage network.

The report shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council by 31 July each year and shall include, but not be limited to, the following information:

a) Details of works that have been undertaken and what these works are expected to achieve;
b) An indication of when any ongoing works will be complete;
c) Details of any investigations undertaken with regard to inflow and infiltration in the Karori catchment; and
d) Details of any works or investigations planned for the next financial year.

Note: One annual inflow and infiltration report may be submitted to the Manager, Environmental Regulation, Wellington Regional Council to meet the requirements in this regard of permits WGN060283 [25227]-[25229).

An annual inflow and infiltration report can be found in Appendix iv.

Condition (16)

The permit holder shall keep a record of any complaints that are received. The record shall contain the following details, where practicable:

f) Name and address of the complainant;
g) Identification of the nature of the complaint;
h) Date and time of the complaint and of the alleged event;
i) Weather conditions at the time of the complaint; and
j) Any measures taken to address the cause of the complaint.

The permit holder shall notify the Manager, Environmental Regulation, Wellington Regional Council of any complaints relating to the exercise of this permit, within twenty-four hours of being received by the permit holder or the next working day.

The permit holder shall forward to the Manager, Environmental Regulation, Wellington Regional Council a copy of any complaints recorded in the annual report required by condition (10) of this permit.

There were no complaints during the 2020/2021 reporting period.

WGN 060283 [35675]

Condition (2)

This consent shall only be exercised when the sewage inflow to the treatment plant exceeds 390 litres per second (L/s), and the 1000 m^3 storage tank is full.

Condition (5)

The permit holder shall monitor and record the time, flow rate, duration and total volume of the bypass overflow discharges into the Karori Stream, and shall report the results to the Manager, Environmental Regulation, Wellington Regional Council, within 10 working days of the overflow event occurring. The permit holder shall maintain an incident log containing the details of each bypass overflow discharge and make it available to the public or the Manager, Environmental Regulation, Wellington Regional Council, upon request.

There have been one bypass event this FY2019/2020. The details are the following:

Date	Duration	Average Influent Flow Rate	Maximum Influent Flow Rate	Average Bypass Flowrate	Total Volume of Bypass	Consented	Cause
dd/mm/yyyy	hrs/mins	L/s	L/s	L/s	m^3	Y/N	--
18/06/2020	N/A	344	450	N/A	N/A	Y	Wet weather in the catchment area.

Table 13: Bypass Event Details

Condition (6)

The permit holder shall submit to the Manager, Environmental Regulation, Wellington Regional Council the amount of rainfall recorded at the Karori Reservoir rain-gauge in each hour for each of the 7 days preceding each bypass overflow event in the annual report required by condition (9) of this permit.

Rainfall data can be found in WGN060283 [25227] Condition 6 of this report.

Condition (7)

The permit holder shall take one representative grab sample of the settled, milli-screened effluent prior to its entry into the Karori Stream every time the discharge authorised by this permit has occurred for more than one hour. Each sample shall be analysed for the following parameters:
pH
Suspended solids g/m3
Total BOD5 g/m3
Faecal coliform bacteria cfu/100ml
Oils/grease g/m3
The results of the monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of the bypass discharge occurring.

Date	pH	Suspended Solids	Total BOD5	Faecal Coliform Bacteria	Oils/Grease
	--	g/m^3	g/m^3	cfu/100mL	g/m^3
18/06/2020	7	280	170	1,400,000	25

Table 14: Partially Treated Effluent Sample Results

WGN060283 [25230]

Condition (3)

The permit holder shall monitor air quality in the vicinity of the plant to confirm the absence of faecal coliforms and salmonella originating from the plant. Sampling is to be carried out at least once every six months.

The sampling method and locations are to be agreed with the Wellington Regional Council within three months of the granting of this permit.

Should the presence of faecal coliforms or salmonella be measured at any time, the Wellington Regional Council may direct that the permit holder sample at least once every month for six months before returning to the six monthly sampling regime.

The results shall be provided annually to Wellington Regional Council as part of the annual report required by condition 8 of this permit.

Ambient Microbe Monitoring was performed at the Western WWTP. The following table is a summary of the air quality monitoring in the vicinity of the WWTP:

Location	Faecal Coliforms		Salmonella	
	28/10/2020	22/04/2021	28/10/2020	22/04/2021
Site 1	Absent	Absent	Absent	Absent
Site 2	Absent	Absent	Absent	Absent
Site 3	Absent	Absent	Absent	Absent

Table 15:Semi-Annual Air Quality Monitoring

The full reports can be found in the quarterly reports for October – December 2020 and April – June 2021.

Condition (4)

The permit holder shall undertake a comprehensive assessment of the quality of the biofilter media on an annual basis (or more frequently if appropriate).

The results of this assessment, including a summary of the findings, details of any action(s) to be taken to improve the efficiency of the biofilter, and a timetable for those actions to be undertaken, shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council within one month of the assessment being undertaken.

Actions to be undertaken may include, but are not limited to:

a) Turning, restructuring and dampening of the bed material,
b) the addition of supplementary bed material, or
c) total bed material replacement.

The first assessment shall be undertaken within three months of the granting of this permit. Subsequent assessments shall be undertaken annually thereafter.

The biofilter monitoring report was performed on October 2020. The report can be found in Appendix ii: Biofilter Monitoring Report.

Condition (5)

The permit holder shall monitor the following parameters at the frequency noted:

a) Weekly visual observations of the state of the biofilter bed, particularly for short circuiting and clogging of the bed;
b) weekly monitoring of pressure drop across the biofilter bed;
c) weekly monitoring of biofilter bed moisture content; and
d) monthly monitoring of biofilter bed pH.

The frequency of (b), (c), and (d) can be altered by agreement in writing by the Manager, Environmental Regulation, Wellington Regional Council.
Monitoring results shall be recorded and be made available to Wellington Regional Council upon request. Information shall be forwarded annually to Wellington Regional Council as part of the annual report required by condition 8 of this permit.

The following graphs summarises the observations for July 2020 – June 2021 Reporting Period:

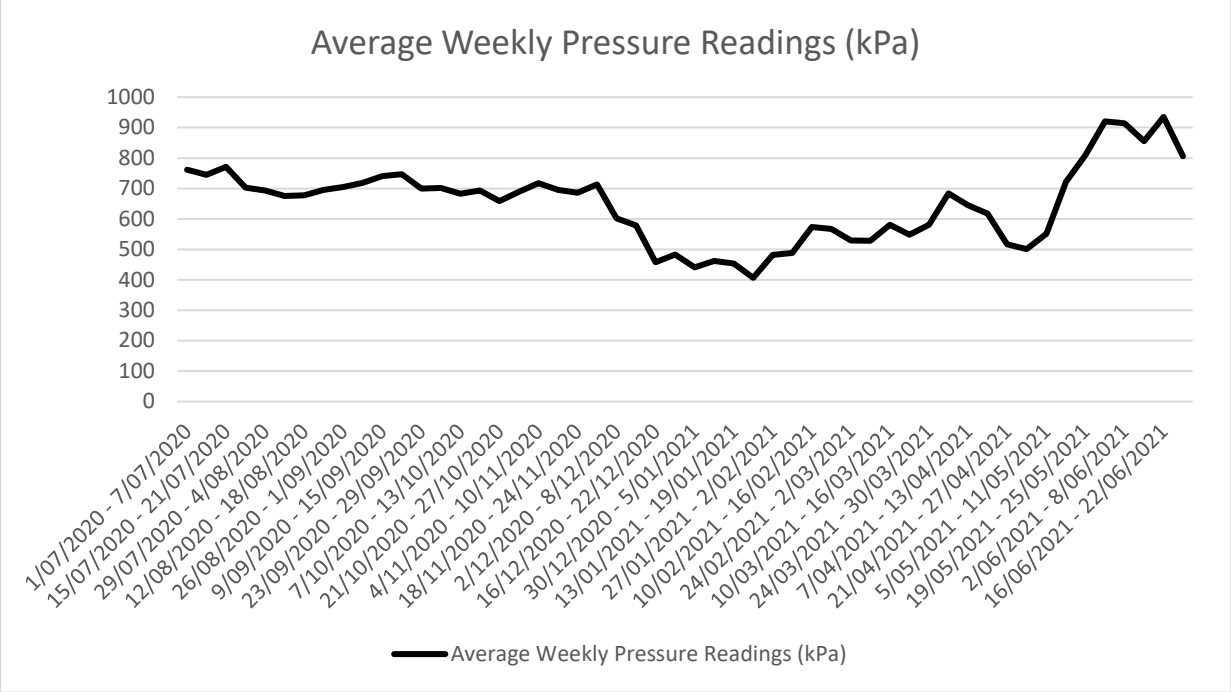


Figure 13: Average Weekly Pressure Readings in Biofilter

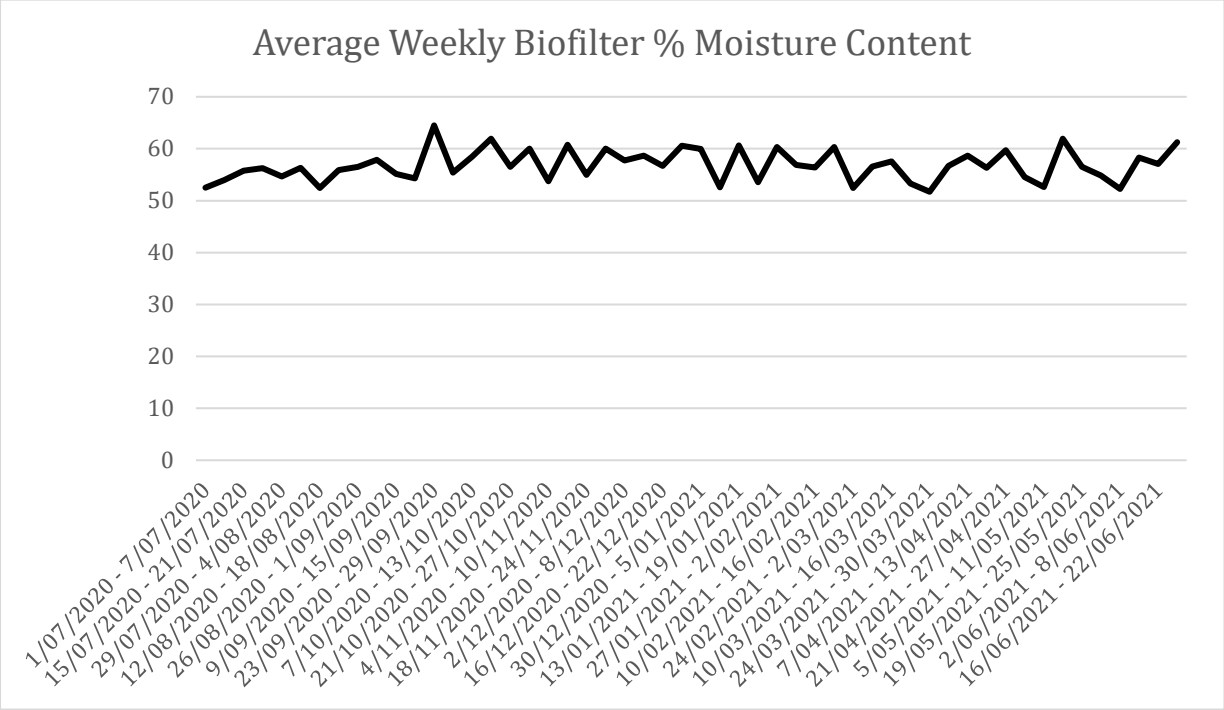


Figure 14: Average Weekly % Moisture Content in Biofilter

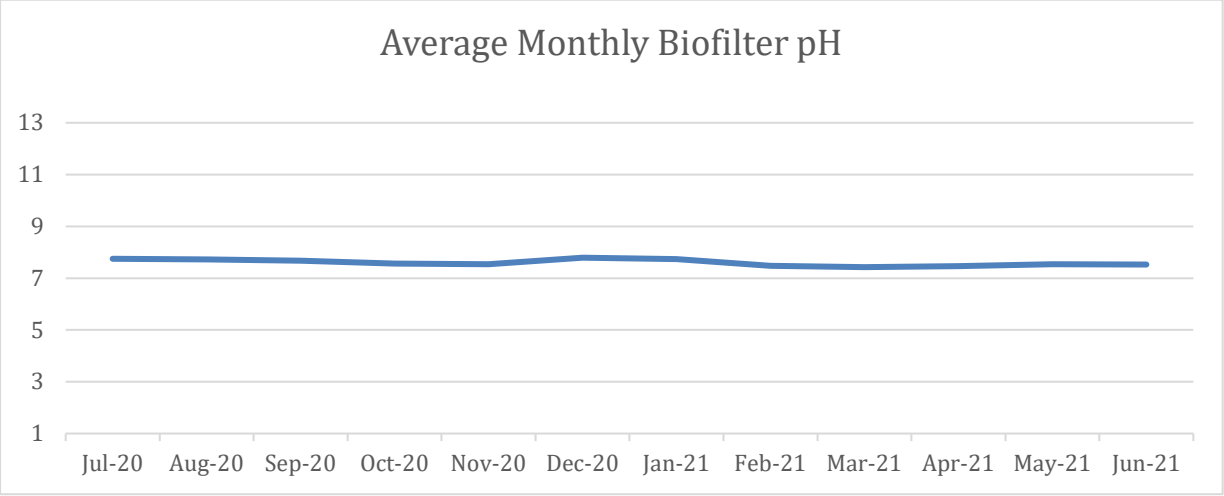


Figure 15: Average Monthly Biofilter pH

Condition (10)

The permit holder shall keep a permanent record of any complaints received alleging adverse effects from the permit holder's operations. The complaints record shall contain the following where practicable:

a) the name and address of the complainant, if supplied;

b) identification of the nature of the complaint;

c) date and time of the complaint and alleged event;

d) weather conditions at the time of the alleged event;

e) results of the permit holder's investigations; and

n any mitigation measures adopted.

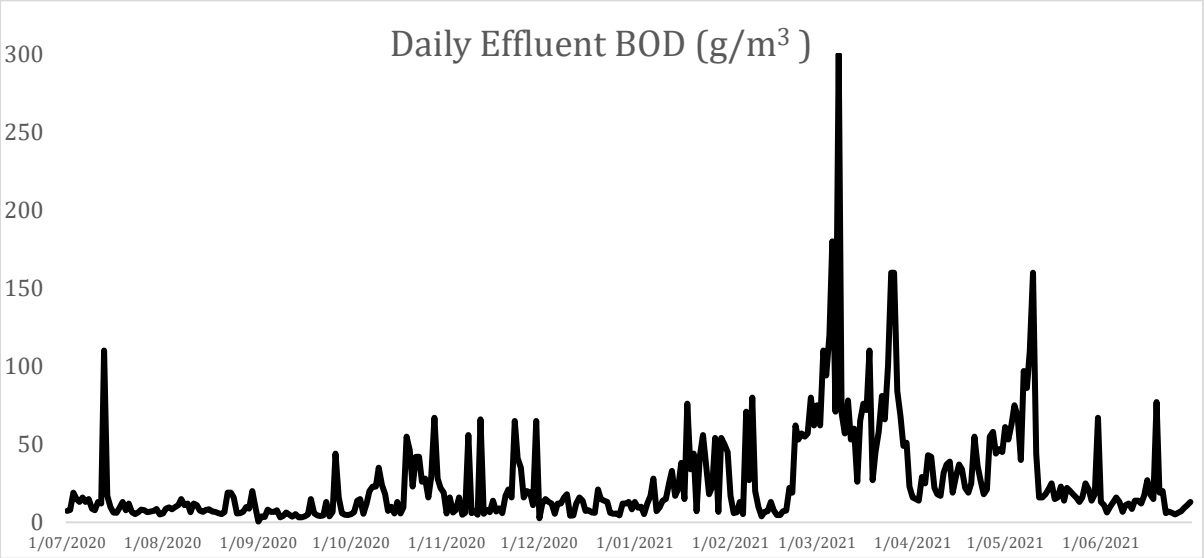
The permit holder shall notify the Manager, Environmental Regulation, Wellington Regional Council of any complaints relating to the exercise of this permit, within twenty-four hours of being received by the permit holder or the next working day.

The permit holder shall forward to the Manager, Environmental Regulation, Wellington Regional Council a copy of any complaints recorded in the annual report required by condition (8) of this permit.

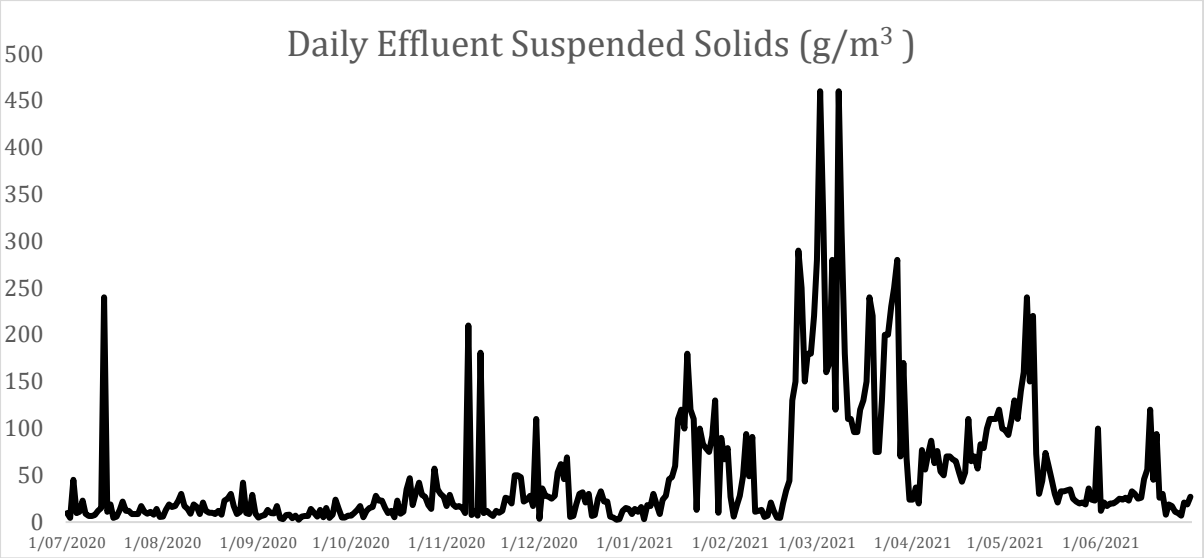
There were no complaints during the 2020/2021 reporting period.

Appendix i: Effluent Quality Results

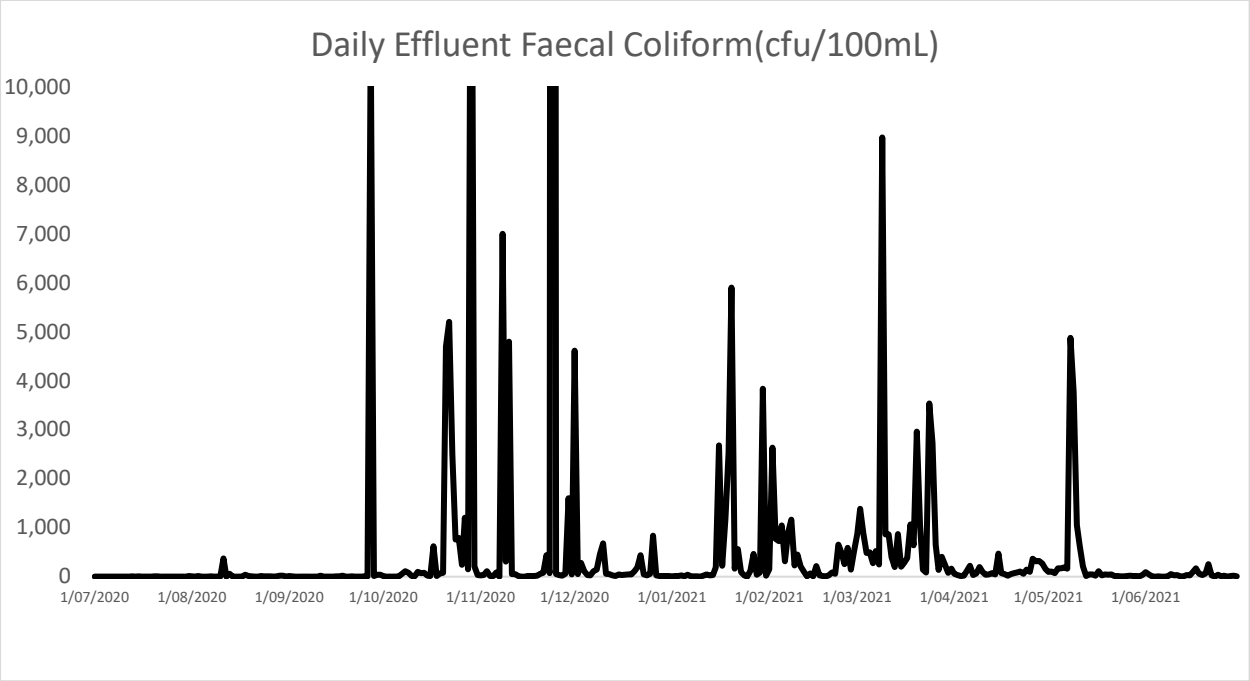
Effluent Biological Oxygen Demand Results



Effluent Suspended Solids Results



Effluent Faecal Coliform Results



Appendix ii:
Biofilter Monitoring Report

Veolia

AMBIENT MICROBE MONITORING OF THE WESTERN TREATMENT PLANT, OCTOBER 2020

Issue

November 2020

Veolia

AMBIENT MICROBE MONITORING OF THE WESTERN TREATMENT PLANT, OCTOBER 2020

Issue

November 2020

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Approved by

Name	Title	Signature
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ACCREDITED IANZ TESTING LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

SOURCE TESTING NZ

Contents

1. Executive Summary

Source Testing New Zealand Limited (STNZ) was commissioned by Veolia to undertake ambient microbe monitoring in the vicinity of the Western Wastewater Treatment Plant (WTP), South Karori Rd, Karori.

The purpose of this monitoring was to confirm compliance with the Company's Resource Consent (WGN060283[25230]).

The results of the ambient microbe monitoring performed at the WTP on 28 October 2020 confirmed the absence of Salmonella, Total Coliforms and Faecal Coliforms in the vicinity of the plant. All bacterial and fungal counts were within the range normally observed in outdoor air in the vicinity of a waste-water treatment plant (Biodet database). All three sites showed the concentration of Aspergillus Fumigatus, Gram Negative microbes and Enterocci to be at or below the method detection limit. The results were higher than those observed in April 2020 but still well within the normal range.

- **Table 1 Western Waste-Water Treatment Plant Ambient Microbe Monitoring, 28 October 2020**

Site	Total Count (CFU/m³)[a]	Filter 1 Breakdown of Total Count					Filter 2		Filter 3		
		Total Bacteria (CFU/m³)[a]	Total Actinomycettes (CFU /m³)[a]	Total Fungi[b] (CFU /m³)[a]	Total Yeasts (CFU/m³)[1]	*Aspergillus Fumigatus*[c] (CFU /m³)[a]	Gram Negative (CFU/m³)[a]	Enterococci (CFU /m³)[a]	Salmonella Present/Absent	Total Coliforms Present/Absent	Faecal Coliforms Present/Absent
Site 1	779	5	<3	774	<3	<3	<3	<3	Absent	Absent	Absent
Site 2	676	<3	<3	673	3	<3	<3	<3	Absent	Absent	Absent
Site 3	757	2	<2	750	5	<2	<2	<2	Absent	Absent	Absent

a) CFU/m^3 = Colony forming units per cubic meter of air at actual temperature and pressure
b) F/Fungi = Filamentous Fungi
c) Aspergillus fumigatus count is included in the Total Fungi count

2. Introduction

Source Testing New Zealand Limited (STNZ) was commissioned by Veolia to undertake ambient microbe monitoring in the vicinity of the Western Wastewater Treatment Plant (WTP), South Karori Rd, Karori.

The purpose of this monitoring was to confirm compliance with the Company's Resource Consent (WGN060283[25230]). Condition 3 of the Company's Resource Consent stipulates that *"The permit holder shall monitor air quality in the vicinity of the plant to confirm the absence of faecal coliforms and salmonella originating from the plant. Sampling is to be carried out at least once every six months"*

Matthew Newby, Senior Air Quality Scientist with STNZ performed the monitoring on 28 October 2020. Matthew has 25 years' air quality monitoring and consulting experience and is designated as a key technical person under the STNZ's IANZ accreditation. Matthew is also a Certified Air Quality Professional (CAQP) under the Clean Air Association of Australia and New Zealand (CASANZ) certification programme.

3. Sampling Methodologies

There are a total of three monitoring sites confirmed with the Wellington Regional Council for monitoring the concentration of ambient microbes in the vicinity of the WTP. These monitoring sites are depicted in Appendix A. Figures 1, 2 and 3 depict the three sampling sites erected in the vicinity of the WTP on 28 October 2020. Samples were collected from each site for determination of the following microbes;

- Enterococci;
- Salmonella;
- Total Coliforms;
- Faecal Coliforms;
- Total Bacteria;
- Total Filamentous Fungi;
- Aspergillus Fumigatus; and
- Total Yeasts; and Total Actinomycetes.

Samples were collected in accordance with NIOSH Method 0500 "Particulates Not Otherwise Regulated, Total" which determines the total aerosol mass. STNZ is IANZ accredited for the sampling portion of this method. Total aerosols were collected on a series of three specially prepared gelatine filters per site. Samples were collected at a rate of 1 to 2 L/min for a period of approximately 6 hours. Due to the limited stability of Salmonella and Faecal Coliforms, filters for these compounds were placed in a specially prepared sterilised broth immediately following sampling. Samples were couriered on ice to the laboratory on the day of sample collection. Biodet Services Ltd, Auckland supplied the filters and performed the analysis. While Biodet are not IANZ accredited for this analysis, they are a well-respected microbiological consulting laboratory and are considered experts in their field. Biodet are also included in STNZ's IANZ accredited Approved Supplier system.

- **Figure 1: WTP Monitoring Site 1**

- **Figure 2: WTP Monitoring Site 2**

- **Figure 3: WTP Monitoring Site 3**

4. Meteorological Conditions

In order to assess potential sources of airborne microbes, wind speed and direction data was collected periodically using a hand held anemometer and compass at each of the sampling sites. Tables 2, 3 and 4 present the field data collected at each site on 28 October 2020. In summary, it was a calm day with only very light southerlies which resulted in some swirling in the valleys. Any fugitive microbes originating from the WTP would likely to be transported to monitoring all three monitoring sites.

- **Table 2: WTP Site 1, 28 October 2020**

Time	Wind Speed (m/s)	Wind Direction (from, degrees)	Temp. (°C)	Ambient Pressure (kPa)
8:38	Calm	Calm	12.2	101.96
9:50	0.7	Swirling	13.2	
10:24	Calm	Calm	14.6	
11:30	Calm	Calm	15.6	
12:16	Calm	Calm	15.7	
13:09	Calm	Calm	18.9	
13:41	1.8	20	15.9	
14:25	1.7	100	15.9	
14:55	0.8	20	19.6	

- **Table 3: WTP Site 2, 28 October 2020**

Time	Wind Speed (m/s)	Wind Direction (from, degrees)	Temp. (°C)	Ambient Pressure (kPa)
8:57	Calm	Calm	13.3	102.03
9:28	Calm	Calm	16.2	
10:35	0.9	280	15.3	
11:10	2.0	340	13.7	
12:01	0.9	280	16.8	
12:55	1.2	200	19.6	
13:47	1.8	240	16.3	
14:11	1.8	280	16.5	
15:20	0.7	200	18.3	

Table 4: WTP Site 3, 28 October 2020

Time	Wind Speed (m/s)	Wind Direction (from, degrees)	Temp. (°C)	Ambient Pressure (kPa)
8:30	Calm	Calm	11.2	101.73
9:46	Calm	Calm	14.8	
10:20	Calm	Calm	15.2	
11:27	Calm	Calm	16.8	
12:12	1.0	120	13.9	
13:06	1.2	100	19.4	
13:39	1.3	140	15.6	
14:21	1.6	140	15.9	
15:00	Calm	Calm	19.9	

5. Ambient Microbe Monitoring Results

5.1 Ambient Microbe Monitoring Results

Presented below are the results of the ambient microbe monitoring performed at the WTP on 28 October 2020. Table 5 presents the results with the analytical report from Biodet presented in Appendix C.

- **Table 5: Western Wastewater Treatment Plant Ambient Microbe Monitoring, 28 October 2020**

Site	Total Count (CFU/m³)[1]	Filter 1 Breakdown of Total Count					Filter 2		Filter 3		
		Total Bacteria (CFU/m³)[a]	Total Actinomycettes (CFU /m³)[a]	Total F/Fungi[b] (CFU /m³)[a]	Total Yeasts (CFU/m³)[a]	*Aspergillus Fumigatus* [c] (CFU /m³)[a]	Gram Negative (CFU/m³)[a]	Enterococci (CFU /m³)[a]	Salmonella Present/Absent	Total Coliforms Present/Absent	Faecal Coliforms Present/Absent
Site 1	779	5	<3	774	<3	<3	<3	<3	Absent	Absent	Absent
Site 2	676	<3	<3	673	3	<3	<3	<3	Absent	Absent	Absent
Site 3	757	2	<2	750	5	<2	<2	<2	Absent	Absent	Absent

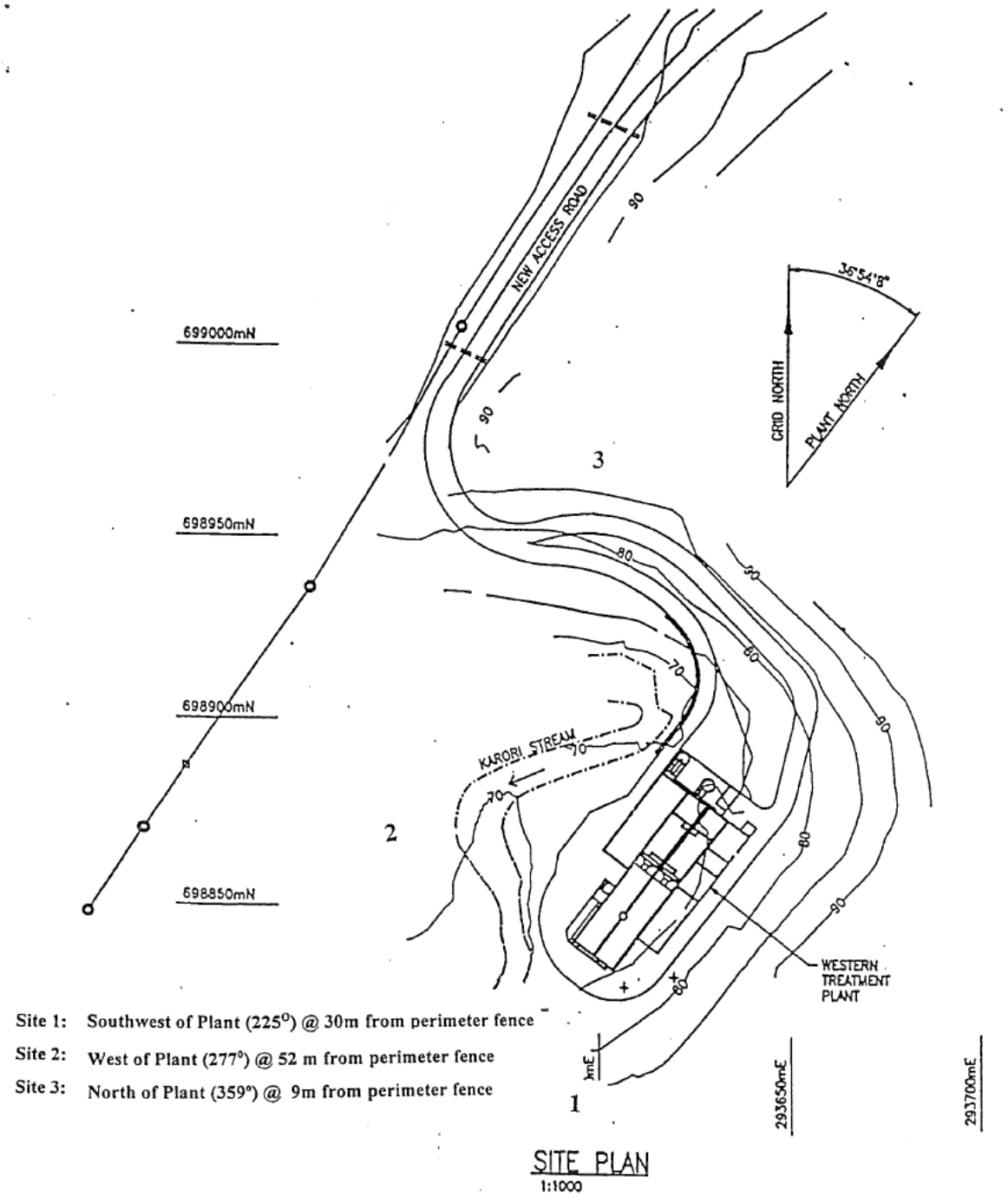
a) CFU/m³ = Colony forming units per cubic meter of air at actual temperature and pressure
b) F/Fungi = Filamentous Fungi
c) Aspergillus fumigatus count is included in the Total Fungi count

5.2 Summary

The results of the ambient microbe monitoring performed at the WTP on 28 October 2020 confirmed the absence of Salmonella, Total Coliforms and Faecal Coliforms in the vicinity of the plant. All bacterial and fungal counts were within the range normally observed in outdoor air in the vicinity of a waste-water treatment plant (Biodet database). All three sites showed the concentration of Aspergillus Fumigatus, Gram Negative microbes and Enterocci to be at or below the method detection limit. The results were higher than those observed in April 2020 but still well within the normal range.

Appendix A Site Plan

This Appendix contains 2 pages including cover.


NEW ACCESS ROAD
699000mN
698950mN
698900mN
698850mN
90
80
70
60
KAROBI STREAM
GRID NORTH
PLANT NORTH
35°54'8"
3
2
1
WESTERN TREATMENT PLANT
293650mE
293700mE
Site 1: Southwest of Plant (225°) @ 30m from perimeter fence
Site 2: West of Plant (277°) @ 52 m from perimeter fence
Site 3: North of Plant (359°) @ 9m from perimeter fence
SITE PLAN
1:1000

Appendix B Raw Sampling Data

This Appendix contains 2 pages including cover.

Ambient Microbe Monitoring Data, WTP 28 October 2020

Sample Description	Sample ID	Sampling Date	Sampling Period	Sample Duration (min)	Initial Flow (L/min)	Final Flow (L/min)	Ave Flow (L/min)	Actual Sample Vol (m^3)
Site 1 Filter 1	ST0941/01	28/10/2020	8:36 - 14:52	376	2.00	2.00	2.00	0.752
Site 1 Filter 2	ST0941/02	28/10/2020	8:36 - 14:52	376	2.05	2.00	2.03	0.761
Site 1 Filter 3	ST0941/03	28/10/2020	8:36 - 14:52	376	2.00	2.00	2.00	0.752
Site 2 Filter 1	ST0941/04	28/10/2020	8:55 - 15:22	387	2.05	2.05	2.05	0.793
Site 2 Filter 2	ST0941/05	28/10/2020	8:55 - 15:22	387	2.00	2.00	2.00	0.774
Site 2 Filter 3	ST0941/06	28/10/2020	8:55 - 15:22	387	2.05	2.05	2.05	0.793
Site 3 Filter 1	ST0941/07	28/10/2020	8:27 - 15:09	392	2.10	2.05	2.08	0.813
Site 3 Filter 2	ST0941/08	28/10/2020	8:27 - 15:09	392	2.05	2.05	2.05	0.804
Site 3 Filter 3	ST0941/09	28/10/2020	8:27 - 15:09	392	2.30	2.30	2.30	0.902

Appendix C Laboratory Reports

This Appendix contains 3 pages including cover.

Biodet Services Ltd
Consulting Industrial Microbiologists

Unit K, 383 Khyber Pass Road, PO Box 99010, Newmarket, Auckland 1149. Phone: 09-529-1563, E-mail: office@biodet.co.nz, www.biodet.co.nz

CULTURABLE AIRBORNE MICROBIAL REPORT

DATE OF REPORT:	**4 November 2020**	**CLIENT:**	**Source Testing New Zealand**
SITE:	**Veolia WTP**		**PO Box 32-017**
DATE OF SAMPLING:	**28 October 2020**		**Maungaraki**
DATE SAMPLES RECEIVED:	**29 October 2020**		**LOWER HUTT 5010**
CLIENT REF NO:	**ST0941**		
BIODET REF NO:	**20/42202**	**ATTN:**	**Matthew Newby**

METHOD: **In-house gelatin filter method (available on request.)**

Volumes Sampled:

	Site 1	Site 2	Site 3
Filter 1	**752L**	**793L**	**813L**
Filter 2	**761L**	**774L**	**804L**
Filter 3	**752L**	**793L**	**902L**

		FILTER 1 - BREAKDOWN OF TOTAL COUNT					FILTER 2		FILTER 3		
LABORATORY NUMBER	**TOTAL COUNT CFU/M³**	**TOTAL BACTERIA CFU/M³**	**TOTAL ACTINOMYCETES CFU/M³**	**TOTAL F/FUNGI CFU/M³**	**TOTAL YEASTS CFU/M³**	***Aspergillus fumigatus* CFU/M³**	**GRAM NEGATIVE CFU/M³**	**ENTEROCOCCI CFU/M³**	***SALMONELLA* Present/Absent**	**TOTAL COLIFORMS Present/Absent**	**FAECAL COLIFORMS Present/Absent**
42202/1 - Site 1	779	5	<3	774	<3	<3	<3	<3	Absent	Absent	Absent
42202/2 - Site 2	676	<3	<3	673	3	<3	<3	<3	Absent	Absent	Absent
42202/3 - Site 3	757	2	<2	750	5	<2	<2	<2	Absent	Absent	Absent

Limit of detection for quantitative analyses is 2-3 cfu per m^3
< = less than
F/FUNGI = FILAMENTOUS FUNGI
The *Aspergillus fumigatus* count is included in the TOTAL FUNGI count.

INTERPRETATION:
Total coliforms are generally found associated with decaying organic material, so are commonly found in soil and wet environments.
Faecal coliforms and *Salmonella* have a relatively short survival time in aerosols.
Faecal Streptococci, Actinomycetes and *Candida* yeast species have good survival in aerosols and are useful indicators of wastewater aerosol pollution.
Total counts of bacteria and fungi give an indication of air quality.
Actinomycetes are soil microorganisms and may indicate disturbance to the soil
Aspergillus fumigatus is indicative of decomposing plant material and has the potential to cause infection in immunocompromised people.
Actinomycete bacteria are becoming recognised as a significant microorganism in indoor air quality, with some species implicated in hypersensitivity pneumonitis.

Report 42202.xlsx 1

Biodet Services Ltd
Consulting Industrial Microbiologists

GUIDELINES: *(based on Biodet database)*

	Colony-forming units (cfu) per cubic meter (m^3) of air	
	Bacteria	***Fungi***
Outdoor air	50-100	50-350
Vicinity of waste-water treatment plant	50-500	500-5000

Note: These counts may increase significantly with soil disturbance in the vicinity

CONCLUSIONS:

The microbial counts for all sites sampled were well within the guidelines for a waste water treatment plant.

***Aspergillus fumigatus*, Gram-negative bacteria, Enterococci, *Escherichia coli* and *Salmonella* were not isolated from any of the sites.**

Yours faithfully

Elaine Khor
B. Sc.
The samples were tested as received.
This report must not be reproduced except in full.

MEMBER OF NEW ZEALAND ASSOCIATION OF CONSULTING LABORATORIES

Report 42202.xlsx 2

Appendix iii:
Western Treatment Plant: Annual Outfall Pipeline Report

Wellington Water

Annual Report:
Western Treatment Plant:

Outfall pipeline maintenance. 1st August 20 to 31st July 21

Condition 23 of Consent No. WGN060283 [35255]

Our water, our future.

Contents

1. Introduction

This report details the maintenance works undertaken on the western treatment plant outfall pipeline as part of condition 23 of the resource consent WGN060283 [35255] and covers the period between 1st August 2020 to 31st July 2021. Figure 1 below is a copy of condition 23 for reference.

The outfall pipeline is 6.25km long, whose alignment generally follows the Karori stream. It is an ageing concrete pipeline, having been built in the 1930's. Over the past year the 381mm inner diameter pipe carried on average between 50-200m^3/hour of treated effluent from the treatment plant to discharge into the Cook Strait. A plan detailing its alignment, including reference chainage, is found in Appendix 1.

Because the majority of the pipeline is adjacent and accessed via the stream, there are corresponding Resource Consents to enable pipeline maintenance. These consents have been changed in 2017 year a hearing relating to the removal of the section regarding the renewal of the pipeline by 2023. The original consent WGN160340 [34178] & [34179], and subsequent changes in WGN060283 [35255], permits both land use consent to undertake works in the Karori Stream bed and water use consent to temporarily and permanently divert the flow of water. All maintenance works on the outfall pipeline are done in accordance with the associated Management and Monitoring Plan. Example photos of the various maintenance works are found in Appendix 2.

Figure 1 - Copy of Condition 23

23. The permit holder shall submit an **annual report** for the main outfall pipeline, which addresses activities undertaken during the previous year, to the Manager, Environmental Regulation, Wellington Regional Council and members of the CLG, by 31 July each year.

    This report shall include, but not be limited to, the following elements:

    a) details of the location, extent and duration of any leakage or faults, and the timing, nature and success of remedial action taken to remedy the leaks or faults;

    b) details of any other works (including any repairs and replacements) undertaken during the past year; and

    c) any work planned in the next 12 months to repair or replace the pipeline.

2. General Pipe Repairs between 1 August 2020 to 31st July 2021

Following Annual Inspection June 2020

In June 2020, the western wastewater treatment plant main outfall pipe was inspected as part of scheduled annual maintenance. Table 1 below is the list of identified risk items found relative to the pipeline itself. All leaks were minor and occurred either at a joint within a pipe section or at the connection points of a manhole.

Only the above ground sections of pipeline were inspected to inspect current condition, signs of leakage and areas of foreseen risk. The remaining buried sections, totaling approximately 3880 metres in length was not inspected, however water samples were captured at areas of concern where indicators for potential leakage presented itself.

Table 1

#	Chainage (m)	Comments	Recommended Actions	Photo	Actions Complete
1	160	Surge Tank requires further inspection	Check surge tank. Will require large digger. Tracks to be cleared to allow access for machinery.Weather permitted as high risk location during rainfall events.		Complete - Surge Tank at Outfall checked by approved contractors. Sand cleared and is in operation.

2	170	Potential minor leak from pipe structure. No sample captured due to insufficient volumes.	Further inspection required to monitor seepage.		Planned Works - Site inspected; confirmed minor leak is present. Planned works required.

3	200	Minor leak from pipe structure, no sample collected due to insufficient flows.	Further inspection required to monitor seepage.		Complete - Leak confirmed and repaired on investigation.

4	850	Manhole lid is not secure	(Optional) Replace existing manhole lid cover with a hinged lid for ease of access.		Complete – No replacement required.
5	900	Accumulated debris around pillars. Potential risk of scouring.	In the stream, gravel needs to be redistributed to form a larger channel to better distribute flow across the whole stream span back to its normal path.		Complete – Vegetation removed around foundation structure.

					
6	1300	Vegetation blocking tunnel exit.	Remove vegetation and debris around tunnel exit.		Complete – Vegetation and debris cleared.

6	1500	Gravel accumulated around entrance to tunnel	Remove gravel and debris around tunnel entrance.		Complete – Vegetation and debris cleared.
7	1580	Possible minor leak from pipe structure, no sample taken as flow insufficient. Vegetation needs clearing	Further investigation required to determine if this seepage or sewer leak.		Planned Works - Site inspected; Leak requires monitoring.

8	1650	Possible minor leak from pipe structure, no sample taken as flow insufficient	Further investigation required to determine if this seepage or sewer leak.		Planned Works - Site inspected; Leak requires monitoring.
9	1860	Vegetation growing on manhole, possible leak from manhole structure	Clear vegetation from manhole structure. Further investigate whether structure leaking		Complete – Vegetation and debris cleared. No leaks visible on inspection.

10	1880	Vegetation growing on manhole, possible localised scouring	Clear vegetation around manhole. Fill in localised scouring to restabilise bank.		Complete – Vegetation and debris cleared. Localised scouring self-filled since last inspection.
11	1900	Pipe Undermined for 1.5m section.	Potential undermining of pipe structure, monitor asset.		Planned Works - Site inspected; Requires monitoring.

12	1920	Slip on pipe, looks to be historical. With no sign of leaks or disturbance to the integrity of the pipe structure.	This is to be monitored.		Planned Works - Site inspected; Requires monitoring.
13	2450	Weeping manhole structure, seepage flow insufficient to capture sample.	Further investigation required to determine if this is pipe leaking or natural seepage.		Planned Works - Site inspected; Requires monitoring.

14	3050	Access track washed away, needs re-establishing	Make safe adjustments to track.		Complete – Track self-adjusted, no addition material or excavations required.
15	3150-3500	Vegetation covering length of above ground pipe section	This section needs to be cleared to allow access to pipe for inspection		Complete – Vegetation cleared. Tracks restored.
16	3590	Weeping manhole structure, the seepage flow was too insufficient to get sample.	Further investigation to determine if it is natural seepage or pipe leak.		Planned Works - Site inspected; Requires monitoring.

17	3750	Large potholes in track.	The track to be suitably reinstated.		Complete – Track backfilled on inspection.
18	4200	Debris built up at bridge pillars.	Remove debris in front of pillars to prevent future stream scour out.		Complete – Debris cleared.

19	4300	Manhole structure potentially leaking, flow insufficient to capture sample.	Further investigation required to determine if this is natural seepage or pipe leak.		Planned Works - Site inspected; Requires monitoring.
20	4325	Fallen logs blocking access to pipeline.	Remove logs and other vegetation.		Planned Works – Logs to be removed.

21	4550	Section is being undermine. This slip looks to have stabilised itself over time with rock underneath the historic washout.	To monitor for any further movement or washout.		Planned Works - Site inspected; Requires monitoring.
22	6100	Manhole structure Leaking.	Organise immediate repair and clear debris. Once debris cleared determine methodology to stabilise bank.		Planned Works – Temporary mortar works complete to minimise seepage. Major works required.

23	6250	Vegetation build-up at foot of pillar	Clear vegetation around pillar.		Complete – Debris cleared.

Track Repairs

Maintaining access via the stream crossing is undertaken between the outfall end (ch0) and ch 4000, where vehicle access is possible. This work was carried out from Sept-Dec 2020.

Vegetation Clearance Works

Vegetation has been cleared where needed to carry out maintenance activities to pipeline during Sept-Dec 2020.

3 Planned Works for 1st August 2021 to 31st July 2022

The list below summarizes the planned works for the upcoming year, as identified during the annual walkover on 8 April 2021:

- Complete the minor leak repairs as deferred from previous annual inspection
- Inspect the surge chamber at ch100.
- Inspection of tunnels at ch1350-1500 and 4400-4450.
- Complete track repair works
- Complete vegetation clearing
- Complete any outlying alterations to the stream bed

Table 2 on the following page offers an overview of each issue/repair that has been identified.

Table 2

No.	Chainage (m)	Comments	Actions	Photo	Sample Result (Fluoride)
1	170	Leak visible. Repair required	Inspect leak, make repair as required.		0.24g/m^3

2	1300	Crack in pipe casing, visible leaking. Areas either side of encasing is lush green. Seepage volume not currnetly enough to capture sample.	Further inspect fault, apply temporary fix to manage seepage. Monitor seepage going forward.		N/A
3	1495	Potential leak in area of green vegetation. Seepage volume not enough to capture sample.	Clear vegetation and gravels to gain visibility. Temporary repair if required.		N/A

4	1515	Potential leak in area of green vegetation. Sample acquired.	Clear vegetation to gain visibility. Temporary repair as required		0.16
5	1675	Pipe is partially undermined.	Requires monitoring.		N/A

6	1840	Structure partially undermined.	Requires monitoring.		N/A
7	1860	Weeping bank, potential leak. Unable to capture sample due to low volume.	Remove vegetation to get visibility on issue.		N/A

8	2140-2150	Large amount of boggy ground at the toe of earth edge. Requires further investigating	Re-inspect site, capture sample from pit and determined if Fluoride levels are elevated.		N/A
9	2375	Green vegetation patch, potential leak.	Clear vegetation. Investigate and repair as necessary.		0.16 g/m^3

10	2460	Weeping manhole structure, green vegetation. Sample acquired	Clear vegetation, seal manhole structure.		0.16 g/m^3
11	2500	Weeping manhole structure marked in pink. Unable to capture sample.	Clear vegetation and seal manhole structure.		N/A

12	2790	Circumferential crack in pipe upstream of joint.	Repair required (Market pink x or MH)		N/A
13	2880	Green vegetation, visible leaking. Sample acquired.	This is to be monitored. Clear vegetation to gain greater visibility. Seal if required.		0.15 g/m^3

14	2885	Green vegetation.	Clear and investigate for leaks.		N/A
15	3025	Water tracking under steel pipe bridge, clear vegetation and inspect for leaks.	Clear vegetation and further inspect for leak.		N/A

16	3100	Weeping pipe enclosure. Sample acquired.	Clear vegetation and further inspect for network leak.		0.15 g/m^3
17	3105	Vegetation heavy towards asset, access track needs clearing.	Clear section of vegetation to allow access to pipe for inspection.		N/A

18	3300	Possible leak, green vegetation present. Sample acquired	Further investigation to determine if it is natural seepage or pipe leak.		0.16 g/m^3
19	3510	Vegetation heavy, grown through tract to pipe bridge.	Cut back and spray vegetation to allow access to inspect bridge.		N/A

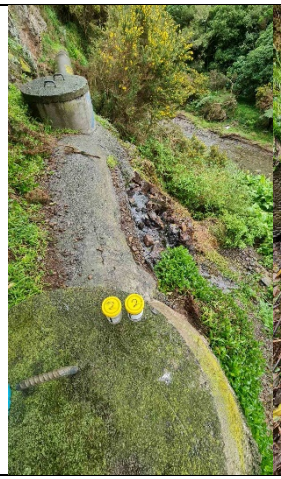
20	3590	Weeping manhole, lush vegetation, leaking into stream. Sample acquired	Further investigate area to confirm if leak is network related.		0.15 g/m^3
21	3950	Green vegetation with visible leakage. Sample acquired	Further investigate area to confirm if leak is network related.		0.16 g/m^3

22	4200	Clear vegetation, build up around footing of pipe structure	Clear vegetation around footing.		N/A
23	4215	Clear vegetation at pipe crossing and cut tracks	Remove vegetation.		N/A

24	4315	Vegetation green, samples acquired	Clear vegetation, locate seepage point and confirm leaking asset.		0.15 g/m^3
25	4325	Logs to be relocated if in the way of asset inspection track.	Remove logs, clear track.		N/A

26	4590, 4610, 4640	Leaks identified from concrete encasing. Samples collected.	Further inspect seepage locations to gauge repair.				0.14 g/m^3, 0.13 g/m^3, 0.15 g/m^3
27	5280, 5290	Leaks identified from manhole structure. Seepage present at marked locations. Samples collected.	Further investigate asset, repair as required.				0.13 g/m^3, 0.14 g/m^3

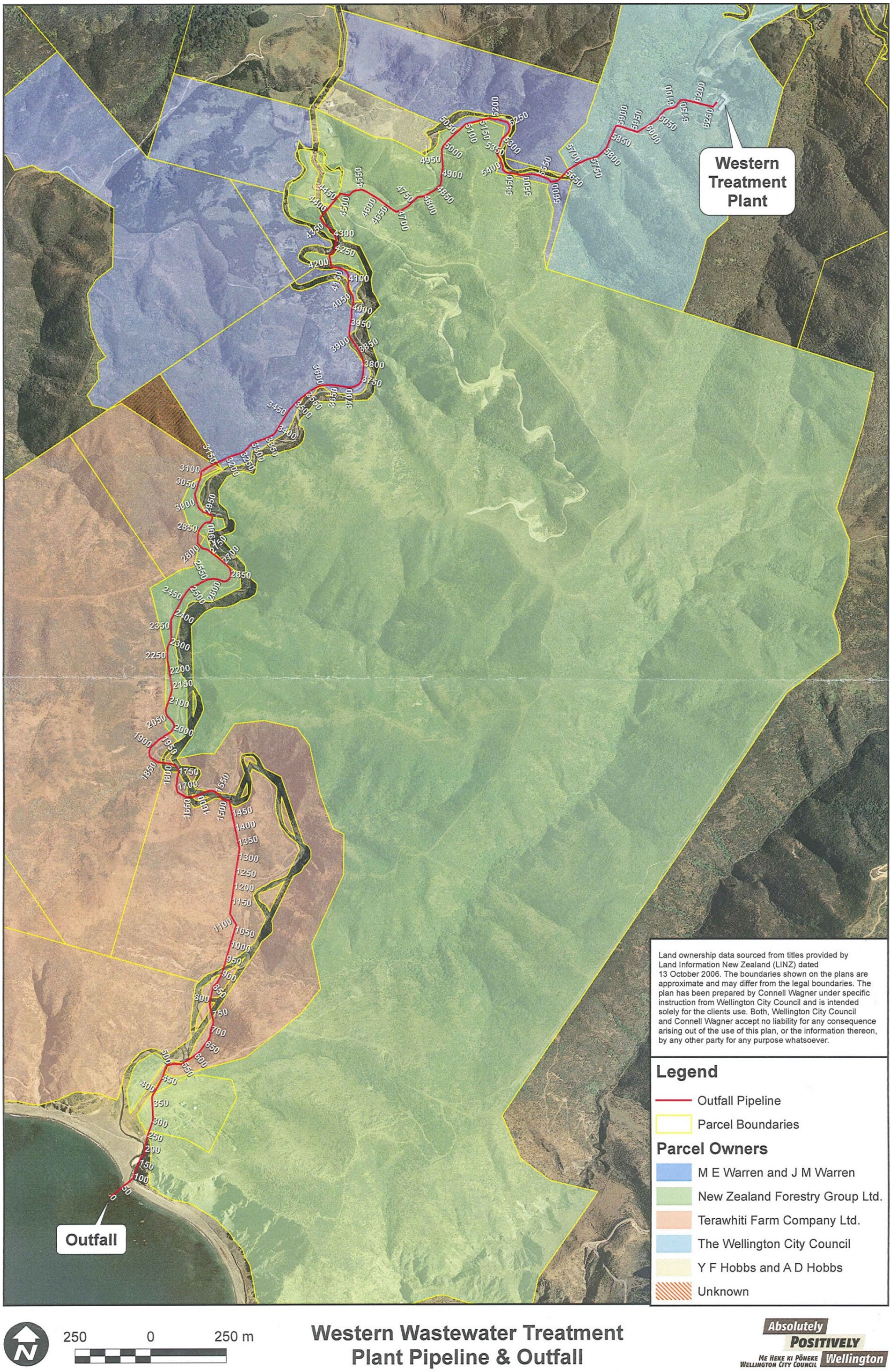
28	5350, 5430	Leaks identified from concrete encasing. Seepage present at marked locations. Samples collected.	Further investigate asset, repair as required.				0.14 g/m^3, 0.14 g/m^3, 0.13 g/m^3
29	5470, 5500	Leaks identified from concrete encasing. Seepage present at marked locations. Samples collected.	Further investigate asset, repair as required.				0.14 g/m^3, 0.13 g/m^3

30	6015, 6030	Leaks identified from concrete encasing. Seepage present at marked locations. Samples collected.	Further investigate asset, more information required as looks like slip has historically occurred in this location.			0.13 g/m^3, 0.14 g/m^3

*Those not yet completed have been deferred to 2021-2022

3. Appendix

Western treatment plant outfall pipeline



Appendix iv:
Western Treatment Plant: Annual Inflow and Infiltration Report FY2020/2021

Condition (12)

The permit holder shall provide the Manager, Environmental Regulation, Wellington Regional Council with an annual report detailing what steps have and will be taken to reduce infiltration and stormwater ingress into the Karori sewerage network.

The report shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council by 31 July each year and shall include, but not be limited to, the following information:

a) Details of works that have been undertaken and what these works are expected to achieve;
b) An indication of when any ongoing works will be completed;
c) Details of any investigations undertaken with regard to inflow and infiltration in the Karori catchment; and
d) Details of any works or investigations planned for the next financial year.

Note: One annual inflow and infiltration report may be submitted to the Manager, Environmental Regulation, Wellington Regional Council to meet the requirements in this regard of permits WGN060283 [25226], [25227], [35674] and [25229].

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 Western Wastewater Treatment Plant (WWTP) and to also improve waterway health. Sections (a), (b), (c) and (d) of Condition 12 are addressed below by the various activities and work programs contributing to inflow and infiltration reduction.

Inflow Surveys

Inflow surveys utilise smoke testing and dye testing to identify faults that contribute to I&I. Two inflow surveys commenced in 2018-2019 in Karori sub-catchments referred to as 18STH and 400STH. These sub-catchments were identified from an initial rainfall derived inflow and infiltration (RDII) assessment utilising short term flow monitoring data.

In 2019-2020 faults were communicated to property owners and subsequent inspections were undertaken to resolve faults with customers. The final re-inspection of non-compliant properties with outstanding faults were undertaken in August 2020 and the project was completed in October 2020. The public faults identified from the inflow surveys and other faults requiring further investigation were completed with maintenance or repairs as required. Currently, there are no further inflow surveys planned for 2021-2022 in the Western WWTP Catchment.

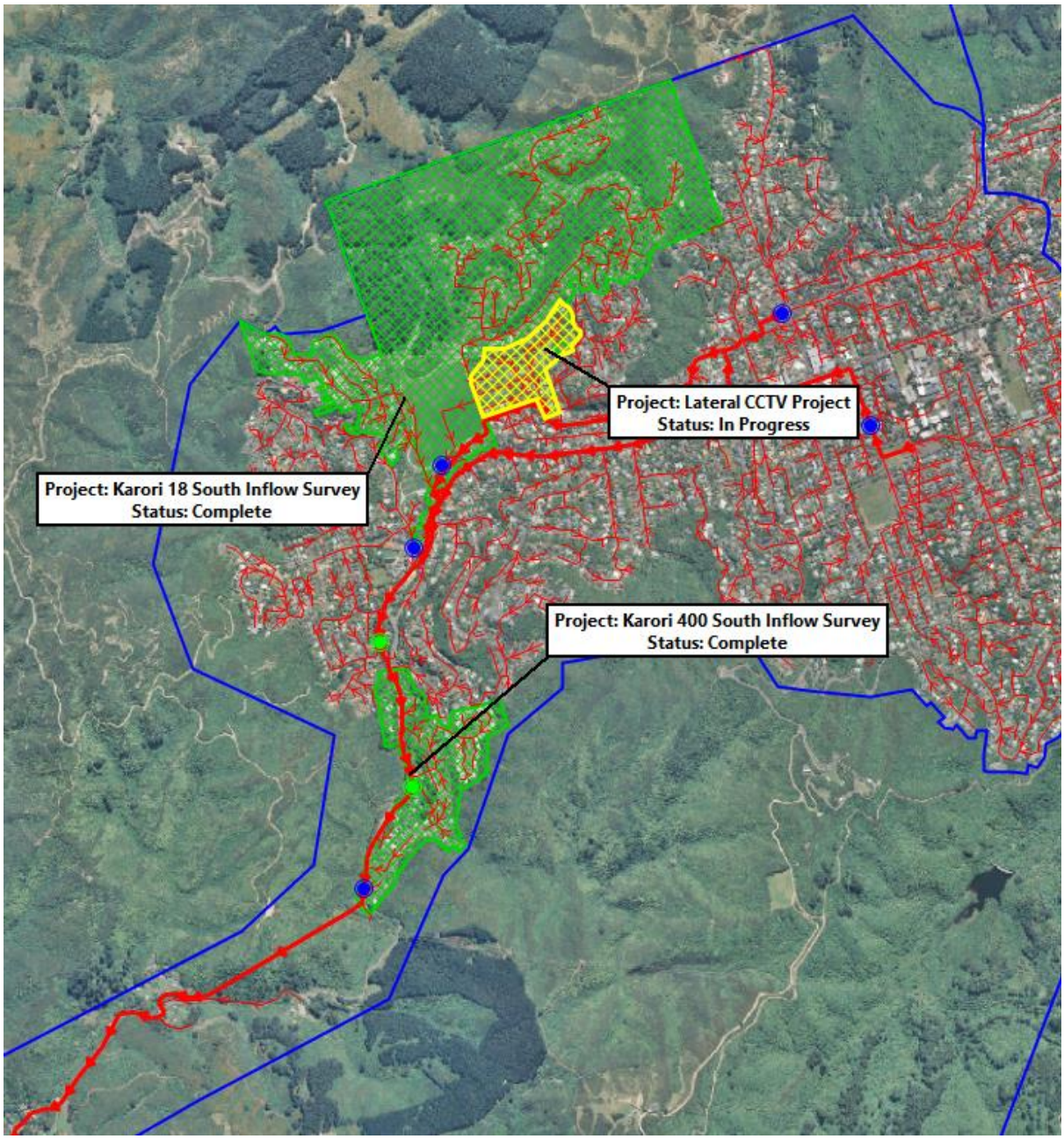
In May 2021, the inspection of private laterals on a sample of properties in Karori was completed. The objective of this project was to understand the condition of private laterals and identify if they may be contributing to I&I. The condition assessment was undertaken by closed circuit television (CCTV) and the detailed fault data is currently being processed. Only 31% of laterals were able to be fully inspected and 34% were partially completed before being abandoned due to tight bends or defects.

The remaining third were unable to be accessed either due to the customer's request or a site constraint such as no entry point available.

Previous I&I investigations in the South Karori Road catchment identified stormwater entering the wastewater network through an overflow pipe outside 115 South Karori Road which occurred in heavy rain events. Reflux valves were installed which assisted in reducing the number of overflows.

A map showing where the recent Inflow Surveys Projects and CCTV of Laterals was located is shown in Figure 1 below. The two Inflow Surveys that were completed are shown in green and the CCTV lateral Project that is currently in progress is shown in yellow.

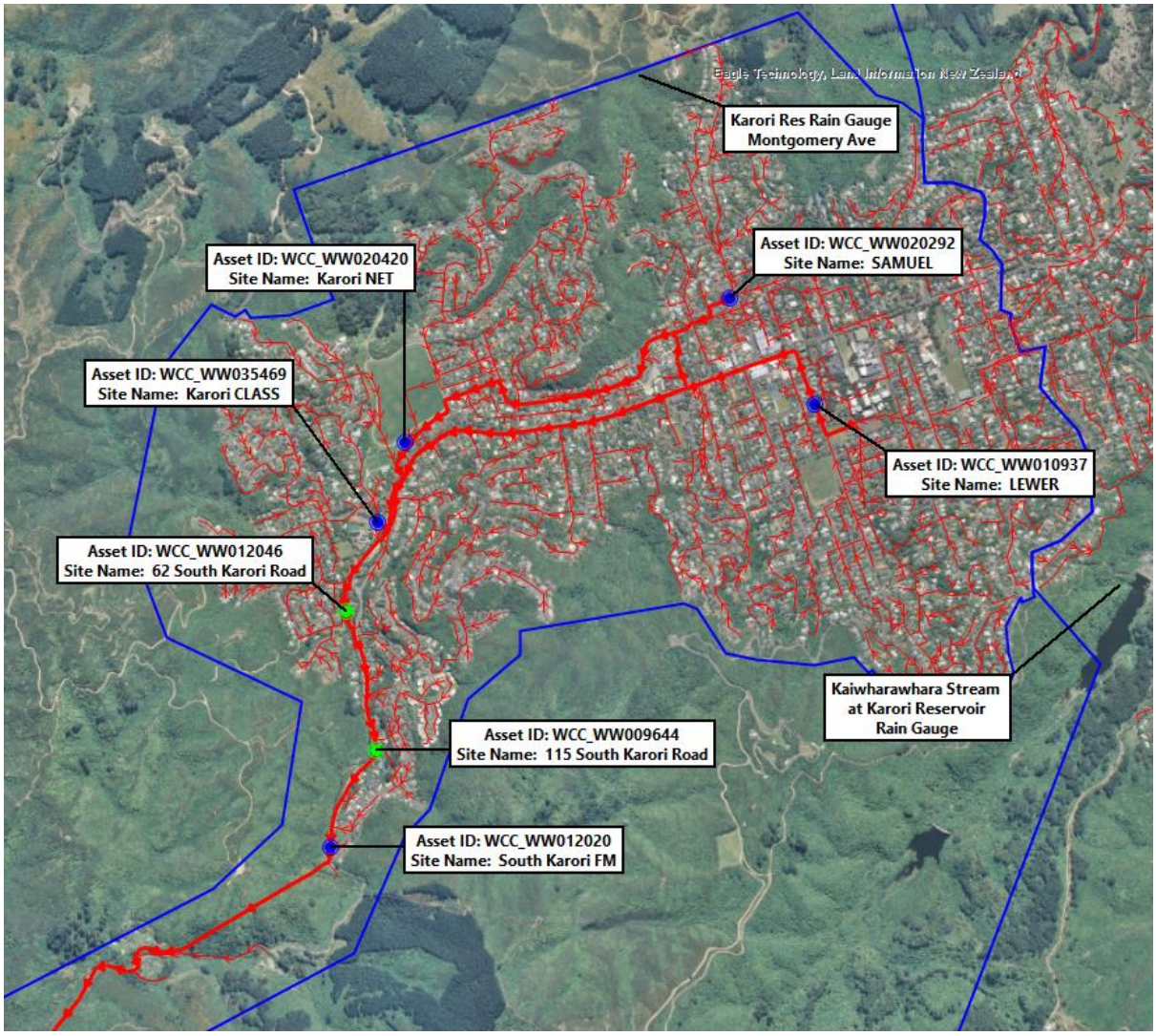
Figure 1 - Inflow Survey and Lateral CCTV Project Locations



Flow Monitoring and Rain Gauge Monitoring

There are currently five flow monitoring sites and two overflow monitoring sites in the Western WWTP Catchment. These are shown below in Figure 2, with green showing overflow sites and flow monitoring sites shown in blue.

Figure 2 - Map of Wastewater Flow and Overflow Monitoring Sites and Rain Gauges



There are two long term overflow monitoring sites at '62 South Karori Road' and '115 South Karori Road' and one long term flow monitoring site 'South Karori FM'.

In addition to the long-term monitoring sites, there are also four flow monitors which have been installed as part of a Major Project which is focused on trialling various network improvements in Karori and measuring the effectiveness. The 'Karori NET' monitor was installed in early 2019 for the purpose of monitoring the I&I reduction from the upstream catchment after inflow surveys were undertaken. 'Karori CLASS' was installed to monitor a nearby catchment that did not have any planned rehabilitation works to validate results from Karori NET. Two additional flow monitors were installed in April 2021 'Samuel' and 'Lewer' to monitor a potential reduction in I&I following relining of public mains.

These flow monitors are expected to remain installed until June 2022 with the results utilised for measuring the effectiveness of I&I reduction works.

There are currently two rain gauges located in Karori which are Kaiwharawhara Stream at Karori Reservoir and Karori Res RG at Montgomery Avenue.

Wastewater Modelling

The Karori wastewater model has recently been updated and an Options Report has been issued in May 2021 summarising options for improving the network performance. The recommendations from this report will be incorporated into a Network Improvement Plan to prioritise operational and capital projects to improve the network.

Condition Assessments

Condition assessment of the wastewater network has been undertaken on some pipes within the Western WWTP catchment in 2020-2021. Condition Assessment using CCTV was completed by the operations team to investigate and respond to performance issues in the network. There was also planned CCTV undertaken in the Friend Street area by an external contractor. Planned condition assessments using CCTV for lower criticality assets in 2021-2022, will be confirmed once budgets are awarded in July 2021.

In the last year, the health assessment of all Very High Critical Assets (VHCA) has also been completed with CCTV and other condition assessment programs underway to further increase the confidence rating of this assessment.

Stormwater and Wastewater Capital Projects

Table 1 below provides a summary of capital projects for wastewater and stormwater assets that were undertaken in 2020-2021 or planned for 2021-2022 financial year. Ongoing operational work such as investigations, reactive maintenance and renewals are also carried out in addition to the planned work listed below.

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

Activity	2020/2021	2021/2022
Karori Stormwater	• Newcombe Crescent Stormwater Renewal	
Karori Wastewater	• Renewal of Wastewater Mains under the Stimulus Funding Programme	• Renewal of Wastewater Mains under the Stimulus Funding Programme

Appendix v:
Western Treatment Plant: Karori Stream Monitoring

Karori Stream at Friend Street

Sample Date	Sample Time	Faecal Coliform (cfu/100 mL)	Wind Direction	Weather
2/07/2020	7:06:00 AM	57000	S	Overcast
16/07/2020	7:12:00 AM	170	S	Overcast
30/07/2020	7:11:00 AM	1600	N	Cloudy
13/08/2020	7:12:00 AM	710	N	Overcast
27/08/2020	7:16:00 AM	60	N	Overcast
10/09/2020	7:13:00 AM	470	NW	Cloudy
23/09/2020	7:12:00 AM	3300	N	Rain
8/10/2020	7:11:00 AM	2500	SE	Cloudy
22/10/2020	7:10:00 AM	210	N	Cloudy
5/11/2020	7:05:00 AM	510	N	Cloudy
19/11/2020	7:10:00 AM	670	S	Cloudy
3/12/2020	7:29:00 AM	690	N	Clear
17/12/2020	6:30:00 AM	1700	N	Overcast
31/12/2020	7:15:00 AM	8200	S	Clear
14/01/2021	7:12:00 AM	1600	NE	Clear
28/01/2021	8:20:00 AM	1300	N	Clear
11/02/2021	7:10:00 AM	980	N	Clear
25/02/2021	8:29:00 AM	2000	N	Overcast
11/03/2021	7:06:00 AM	1200	S	Overcast
24/03/2021	7:09:00 AM	2400	NE	Overcast
8/04/2021	7:06:00 AM	1.8	N	Clear
22/04/2021	7:02:00 AM	760	N	Cloudy
6/05/2021	7:08:00 AM	1800	N	Clear
19/05/2021	7:09:00 AM	880	NW	Cloudy
3/06/2021	7:39:00 AM	1600	N	Cloudy
17/06/2021	7:06:00 AM	400	S	Overcast

Karori Stream at Campbell Street

Sample Date	Sample Time	Faecal Coliform (cfu/100 mL)	Wind Direction	Weather
2/07/2020	7:06:00 AM	38000	S	Overcast
16/07/2020	7:12:00 AM	210	S	Overcast
30/07/2020	7:11:00 AM	470	N	Cloudy
13/08/2020	7:12:00 AM	280	N	Overcast
27/08/2020	7:16:00 AM	500	N	Overcast
10/09/2020	7:13:00 AM	430	NW	Cloudy
23/09/2020	7:12:00 AM	230	N	Rain
8/10/2020	7:11:00 AM	2200	SE	Cloudy
22/10/2020	7:10:00 AM	1900	N	Cloudy
5/11/2020	7:05:00 AM	590	N	Cloudy
19/11/2020	7:10:00 AM	540	S	Cloudy
3/12/2020	7:29:00 AM	370	N	Clear
17/12/2020	6:30:00 AM	880	N	Overcast
31/12/2020	7:15:00 AM	300	S	Clear
14/01/2021	7:12:00 AM	120	NE	Clear
28/01/2021	8:20:00 AM	140	N	Clear
11/02/2021	7:10:00 AM	2400	N	Clear
25/02/2021	8:29:00 AM	1000	N	Overcast
11/03/2021	7:06:00 AM	120	S	Overcast
24/03/2021	7:09:00 AM	440	NE	Overcast
8/04/2021	7:06:00 AM	1.6	N	Clear
22/04/2021	7:02:00 AM	160	N	Cloudy
6/05/2021	7:08:00 AM	140	N	Clear
19/05/2021	7:09:00 AM	120	NW	Cloudy
3/06/2021	7:39:00 AM	70	N	Cloudy
17/06/2021	7:06:00 AM	1200	S	Overcast

Karori Stream at South Karori Road

Sample Date	Sample Time	Faecal Coliform (cfu/100 mL)	Wind Direction	Weather
2/07/2020	7:06:00 AM	230	S	Overcast
16/07/2020	7:12:00 AM	210	S	Overcast
30/07/2020	7:11:00 AM	74	N	Cloudy
13/08/2020	7:12:00 AM	330	N	Overcast
27/08/2020	7:16:00 AM	390	N	Overcast
10/09/2020	7:13:00 AM	300	NW	Cloudy
23/09/2020	7:12:00 AM	280	N	Rain
8/10/2020	7:11:00 AM	2000	SE	Cloudy
22/10/2020	7:10:00 AM	54	N	Cloudy
5/11/2020	7:05:00 AM	250	N	Cloudy
19/11/2020	7:10:00 AM	390	S	Cloudy
3/12/2020	7:29:00 AM	490	N	Clear
17/12/2020	6:30:00 AM	110	N	Overcast
31/12/2020	7:15:00 AM	120	S	Clear
14/01/2021	7:12:00 AM	120	NE	Clear
28/01/2021	8:20:00 AM	190	N	Clear
11/02/2021	7:10:00 AM	330	N	Clear
25/02/2021	8:29:00 AM	330	N	Overcast
11/03/2021	7:06:00 AM	780	S	Overcast
24/03/2021	7:09:00 AM	120	NE	Overcast
8/04/2021	7:06:00 AM	220	N	Clear
22/04/2021	7:02:00 AM	380	N	Cloudy
6/05/2021	7:08:00 AM	98	N	Clear
19/05/2021	7:09:00 AM	220	NW	Cloudy
3/06/2021	7:39:00 AM	500	N	Cloudy
17/06/2021	7:06:00 AM	820	S	Overcast

Karori Stream at approximately 100 metres upstream of the Western Treatment Plant

Sample Date	Sample Time	Faecal Coliform (cfu/100 mL)	Wind Direction	Weather
2/07/2020	7:06:00 AM	120	S	Overcast
16/07/2020	7:12:00 AM	82	S	Overcast
30/07/2020	7:11:00 AM	64	N	Cloudy
13/08/2020	7:12:00 AM	120	N	Overcast
27/08/2020	7:16:00 AM	60	N	Overcast
10/09/2020	7:13:00 AM	130	NW	Cloudy
23/09/2020	7:12:00 AM	230	N	Rain
8/10/2020	7:11:00 AM	1100	SE	Cloudy
22/10/2020	7:10:00 AM	90	N	Cloudy
5/11/2020	7:05:00 AM	120	N	Cloudy
19/11/2020	7:10:00 AM	270	S	Cloudy
3/12/2020	7:29:00 AM	310	N	Clear
17/12/2020	6:30:00 AM	100	N	Overcast
31/12/2020	7:15:00 AM	110	S	Clear
14/01/2021	7:12:00 AM	48	NE	Clear
28/01/2021	8:20:00 AM	420	N	Clear
11/02/2021	7:10:00 AM	100	N	Clear
25/02/2021	8:29:00 AM	230	N	Overcast
11/03/2021	7:06:00 AM	400	S	Overcast
24/03/2021	7:09:00 AM	66	NE	Overcast
8/04/2021	7:06:00 AM	62	N	Clear
22/04/2021	7:02:00 AM	80	N	Cloudy
6/05/2021	7:08:00 AM	60	N	Clear
19/05/2021	7:09:00 AM	170	NW	Cloudy
3/06/2021	7:39:00 AM	420	N	Cloudy
17/06/2021	7:06:00 AM	680	S	Overcast

Karori Stream at approximately 100 metres downstream of the Western Treatment Plant

Sample Date	Sample Time	Faecal Coliform (cfu/100 mL)	Wind Direction	Weather
2/07/2020	7:06:00 AM	200	S	Overcast
16/07/2020	7:12:00 AM	130	S	Overcast
30/07/2020	7:11:00 AM	50	N	Cloudy
13/08/2020	7:12:00 AM	120	N	Overcast
27/08/2020	7:16:00 AM	82	N	Overcast
10/09/2020	7:13:00 AM	180	NW	Cloudy
23/09/2020	7:12:00 AM	200	N	Rain
8/10/2020	7:11:00 AM	1100	SE	Cloudy
22/10/2020	7:10:00 AM	50	N	Cloudy
5/11/2020	7:05:00 AM	130	N	Cloudy
19/11/2020	7:10:00 AM	3300	S	Cloudy
3/12/2020	7:29:00 AM	250	N	Clear
17/12/2020	6:30:00 AM	90	N	Overcast
31/12/2020	7:15:00 AM	500	S	Clear
14/01/2021	7:12:00 AM	72	NE	Clear
28/01/2021	8:20:00 AM	160	N	Clear
11/02/2021	7:10:00 AM	120	N	Clear
25/02/2021	8:29:00 AM	240	N	Overcast
11/03/2021	7:06:00 AM	260	S	Overcast
24/03/2021	7:09:00 AM	68	NE	Overcast
8/04/2021	7:06:00 AM	50	N	Clear
22/04/2021	7:02:00 AM	88	N	Cloudy
6/05/2021	7:08:00 AM	50	N	Clear
19/05/2021	7:09:00 AM	160	NW	Cloudy
3/06/2021	7:39:00 AM	480	N	Cloudy
17/06/2021	7:06:00 AM	640	S	Overcast

Appendix vi:
Western Treatment Plant Wet Weather Discharge Letters

2 October 2020

Manager, Consents Management
Greater Wellington Regional Council
PO Box 11646
WELLINGTON

Dear Consents Management Manager,

Overflow Discharge from the Western Treatment Plant

Condition 6 of both resource consent WGN060283 [25227] and WGN060283 [35674] and Condition 5 of resource consent WGN060283 [35675] state that notification is required to update the Manger, Environmental Regulation, Wellington Regional Council about any overflow discharges. This letter serves as notification of the consented overflow discharges from the Western Treatment Plant. The discharges were due to the heavy rainfall in the catchment.

The following is a summary of the parameters monitored during the overflow discharge:

Parameter	WWTP	Stream Discharge	Coastal Discharge
Start	--	10/09/2020 20:22	10/09/2020 20:20
End	--	10/09/2020 22:50	10/09/2020 22:57
Duration	--	2:28:00	2:37:00
Mean Flow	253	10	43
Peak Flow	315	27	98
Discharge Volume	--	86	412

Table 1: Discharge Monitoring Parameters

Resource consent WGN060283 [25227] applies when the plant inlet flow rate is greater than 190L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the coastal outfall pipeline when the discharge period has been over two (2) hours. Resource consent WGN060283 [35675] applies only when the plant inlet flow rate is greater that 390L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the Karori Stream when the discharge period has been over one (1) hour.

Since the recent discharge meets the criteria, a sample was collected. The following are the analytical results that have been received for the sample:

Veolia Water Ltd.
A: 127 Stewart Duff Drive, Rongotai, Wellington, New Zealand, 6003
T: 0800-928-371 W: **www.veolia.com.au**

Date	pH	Total Suspended Solids	Total BOD_5	Faecal Coliforms	Oil/Grease
dd/mm/yyyy	-	g/m^3	g/m^3	cfu/100mL	g/m^3
11/09/2020	7	53	45	600000	9

Table 2: Settled and Milli-Screened Effluent Sample

Condition 8 of resource consent WGN060283 [25227] states that 2 representative water samples are collected from knee deep water at 4 different locations along the Wellington South Coast coastal marine area when the discharge exceeds ten (10) hours. The samples must be collected within 24 hours of the discharge commencing and 12-48 hours after the discharge has ceased.

The discharge did not met the requirements of this condition so a sample was not collected.

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 8 states that a representative grab sample of the treated effluent be collected prior to entry into Karori Stream when the discharge period has been over two hours (2).

Since the recent discharge did meets this criteria, a sample was collected. The following are the analytical results:

Date	Total Suspended Solids	Ammoniacal Nitrogen	Total BOD_5	Faecal Coliforms
dd/mm/yyyy	g/m^3	g/m^3	g/m^3	cfu/100mL
11/09/2020	13	1.4	3.7	11

Table 3: Treated Effluent Sample

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 9 states that a Karori Stream sample be taken when the discharge period has been over 24 hours. Resource consent WGN060283 [35675] applies when the plant inlet flow rate is greater than 390L/s. Condition 8 states that a Karori Stream sample be taken when the discharge period has been over one (1) hour. This sample is to be repeated in two (2) hourly intervals.

Since the recent discharge meets the criteria, a sample was collected. The following are the analytical results:

Date	Suspended Solids	Ammoniacal Nitrogen	Total BOD_5	Faecal Coliform Bacteria
dd/mm/yyyy	g/m^3	g/m^3	g/m^3	g/m^3
11/09/2020	4	0.005	0.970000029	470

Table 4: Karori Stream Sample

If there are any questions please feel free to contact me.

Regards,

Edward Yong
Safety, Risk, and Compliance Officer

9 October 2020

Manager, Consents Management
Greater Wellington Regional Council
PO Box 11646
WELLINGTON

Dear Consents Management Manager,

Overflow Discharge from the Western Treatment Plant

Condition 6 of both resource consent WGN060283 [25227] and WGN060283 [35674] and Condition 5 of resource consent WGN060283 [35675] state that notification is required to update the Manger, Environmental Regulation, Wellington Regional Council about any overflow discharges. This letter serves as notification of the consented overflow discharges from the Western Treatment Plant. The discharges were due to the heavy rainfall in the catchment.

The following is a summary of the parameters monitored during the overflow discharge:

Parameter	WWTP	Stream Discharge	Coastal Discharge
Start	--	27/09/2020 1:24	27/09/2020 6:59
End	--	27/09/2020 8:42	27/09/2020 8:47
Duration	--	7:18:00	1:48:00
Mean Flow	242L/s	3L/s	33L/s
Peak Flow	281L/s	14L/s	63L/s
Discharge Volume	--	58m^3	213m^3

Table 1: Discharge Monitoring Parameters

Resource consent WGN060283 [25227] applies when the plant inlet flow rate is greater than 190L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the coastal outfall pipeline when the discharge period has been over two (2) hours. Resource consent WGN060283 [35675] applies only when the plant inlet flow rate is greater that 390L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the Karori Stream when the discharge period has been over one (1) hour.

Since the recent discharge meets the criteria, a sample was collected. The following are the analytical results that have been received for the sample:

Veolia Water Ltd.
A: 127 Stewart Duff Drive, Rongotai, Wellington, New Zealand, 6003
T: 0800-928-371 W: **www.veolia.com.au**

Date	pH	Total Suspended Solids	Total BOD_5	Faecal Coliforms	Oil/Grease
dd/mm/yyyy	-	g/m^3	g/m^3	cfu/100mL	g/m^3
27/09/2020	6.7	61	77	960,000	12

Table 2: Settled and Milli-Screened Effluent Sample

Condition 8 of resource consent WGN060283 [25227] states that 2 representative water samples are collected from knee deep water at 4 different locations along the Wellington South Coast coastal marine area when the discharge exceeds ten (10) hours. The samples must be collected within 24 hours of the discharge commencing and 12-48 hours after the discharge has ceased.

The discharge did not met the requirements of this condition so no sample was collected.

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 8 states that a representative grab sample of the treated effluent be collected prior to entry into Karori Stream when the discharge period has been over two hours (2).

Since the recent discharge did meets this criteria, a sample was collected. The following are the analytical results:

Date	Total Suspended Solids	Ammoniacal Nitrogen	Total BOD_5	Faecal Coliforms
dd/mm/yyyy	g/m^3	g/m^3	g/m^3	cfu/100mL
27/09/2020	26	2.4	31	12000

Table 3: Treated Effluent Sample

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 9 states that a Karori Stream sample be taken when the discharge period has been over 24 hours. Resource consent WGN060283 [35675] applies when the plant inlet flow rate is greater than 390L/s. Condition 8 states that a Karori Stream sample be taken when the discharge period has been over one (1) hour. This sample is to be repeated in two (2) hourly intervals.

Since the recent discharge meets the criteria, a sample was collected. The following are the analytical results:

Date	Suspended Solids	Ammoniacal Nitrogen	Total BOD_5	Faecal Coliform Bacteria
dd/mm/yyyy	g/m^3	g/m^3	g/m^3	g/m^3
27/09/2020	110	0.016	3.4	8200

Table 4: Karori Stream Sample

If there are any questions please feel free to contact me.

Regards,

Edward Yong
Safety, Risk, and Compliance Officer

27 November 2020

Manager, Consents Management
Greater Wellington Regional Council
PO Box 11646
WELLINGTON

Dear Consents Management Manager,

Overflow Discharge from the Western Treatment Plant

Condition 6 of both resource consent WGN060283 [25227] and WGN060283 [35674] and Condition 5 of resource consent WGN060283 [35675] state that notification is required to update the Manger, Environmental Regulation, Wellington Regional Council about any overflow discharges. This letter serves as notification of the consented overflow discharges from the Western Treatment Plant. The discharges were due to the heavy rainfall in the catchment.

The following is a summary of the parameters monitored during the overflow discharge:

Parameter	WWTP	Stream Discharge	Coastal Discharge
Start	--	8/11/2020 8:44	8/11/2020 8:42
End	--	8/11/2020 13:58	8/11/2020 13:57
Duration	--	5:14:00	5:15:00
Mean Flow	330	38	131
Peak Flow	434	69	224
Discharge Volume	--	715	2480

Table 1: Discharge Monitoring Parameters

Resource consent WGN060283 [25227] applies when the plant inlet flow rate is greater than 190L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the coastal outfall pipeline when the discharge period has been over two (2) hours. Resource consent WGN060283 [35675] applies only when the plant inlet flow rate is greater that 390L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the Karori Stream when the discharge period has been over one (1) hour.

Since the recent discharge meets the criteria, a sample was collected. The following are the analytical results that have been received for the sample:

Veolia Water Ltd.
A: 127 Stewart Duff Drive, Rongotai, Wellington, New Zealand, 6003
T: 0800-928-371 W: **www.veolia.com.au**

Date	pH	Total Suspended Solids	Total BOD_5	Faecal Coliforms	Oil/Grease
dd/mm/yyyy	-	g/m^3	g/m^3	cfu/100mL	g/m^3
8/11/2020	6.6	280	170	1,400,000	24.8

Table 2: Settled and Screened Effluent Sample

Condition 8 of resource consent WGN060283 [25227] states that 2 representative water samples are collected from knee deep water at 4 different locations along the Wellington South Coast coastal marine area when the discharge exceeds ten (10) hours. The samples must be collected within 24 hours of the discharge commencing and 12-48 hours after the discharge has ceased.

The discharge not met the requirements of this condition so a sample was not required.

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 8 states that a representative grab sample of the treated effluent be collected prior to entry into Karori Stream when the discharge period has been over two hours (2).

Since the recent discharge did meets this criteria, a sample was collected. The following are the analytical results:

Date	Total Suspended Solids	Ammoniacal Nitrogen	Total BOD_5	Faecal Coliforms
dd/mm/yyyy	g/m^3	g/m^3	g/m^3	cfu/100mL
8/11/2020	440	8.7	210	390,000

Table 3: Treated Effluent Sample

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 9 states that a Karori Stream sample be taken when the discharge period has been over 24 hours. Resource consent WGN060283 [35675] applies when the plant inlet flow rate is greater than 390L/s. Condition 8 states that a Karori Stream sample be taken when the discharge period has been over one (1) hour. This sample is to be repeated in two (2) hourly intervals.

Since the recent discharge meets the criteria, a sample was collected. The following are the analytical results:

Date	Suspended Solids	Ammoniacal Nitrogen	Total BOD_5	Faecal Coliform Bacteria
dd/mm/yyyy	g/m^3	g/m^3	g/m^3	g/m^3
8/11/2020	240	0.045	3.8	38000

Table 4: Karori Stream Sample

If there are any questions please feel free to contact me.

Regards,

Edward Yong
Safety, Risk, and Compliance Officer

27 November 2020

Manager, Consents Management
Greater Wellington Regional Council
PO Box 11646
WELLINGTON

Dear Consents Management Manager,

Overflow Discharge from the Western Treatment Plant

Condition 6 of both resource consent WGN060283 [25227] and WGN060283 [35674] and Condition 5 of resource consent WGN060283 [35675] state that notification is required to update the Manger, Environmental Regulation, Wellington Regional Council about any overflow discharges. This letter serves as notification of the consented overflow discharges from the Western Treatment Plant. The discharges were due to the heavy rainfall in the catchment.

The following is a summary of the parameters monitored during the overflow discharge:

Parameter	WWTP	Stream Discharge	Coastal Discharge
Start	--	10/11/2020 8:34	10/11/2020 8:32
End	--	10/11/2020 11:35	10/11/2020 11:43
Duration	--	3:01:00	3:11:00
Mean Flow	274	21	74
Peak Flow	358	41	155
Discharge Volume	--	231	853

Table 1: Discharge Monitoring Parameters

Resource consent WGN060283 [25227] applies when the plant inlet flow rate is greater than 190L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the coastal outfall pipeline when the discharge period has been over two (2) hours. Resource consent WGN060283 [35675] applies only when the plant inlet flow rate is greater that 390L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the Karori Stream when the discharge period has been over one (1) hour.

Since the recent discharge meets the criteria, a sample was collected. The following are the analytical results that have been received for the sample:

Veolia Water Ltd.
A: 127 Stewart Duff Drive, Rongotai, Wellington, New Zealand, 6003
T: 0800-928-371 W: **www.veolia.com.au**

Date	pH	Total Suspended Solids	Total BOD_5	Faecal Coliforms	Oil/Grease
dd/mm/yyyy	-	g/m^3	g/m^3	cfu/100mL	g/m^3
10/11/2020	7.2	130	67	2,900,000	24.4

Table 2: Settled and Screened Effluent Sample

Condition 8 of resource consent WGN060283 [25227] states that 2 representative water samples are collected from knee deep water at 4 different locations along the Wellington South Coast coastal marine area when the discharge exceeds ten (10) hours. The samples must be collected within 24 hours of the discharge commencing and 12-48 hours after the discharge has ceased.

The discharge not met the requirements of this condition so a sample was not required.

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 8 states that a representative grab sample of the treated effluent be collected prior to entry into Karori Stream when the discharge period has been over two hours (2).

Since the recent discharge did meets this criteria, a sample was collected. The following are the analytical results:

Date	Total Suspended Solids	Ammoniacal Nitrogen	Total BOD_5	Faecal Coliforms
dd/mm/yyyy	g/m^3	g/m^3	g/m^3	cfu/100mL
10/11/2020	10	3.9	8.7	11000

Table 3: Treated Effluent Sample

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 9 states that a Karori Stream sample be taken when the discharge period has been over 24 hours. Resource consent WGN060283 [35675] applies when the plant inlet flow rate is greater than 390L/s. Condition 8 states that a Karori Stream sample be taken when the discharge period has been over one (1) hour. This sample is to be repeated in two (2) hourly intervals.

Since the recent discharge do not meet the criteria, a sample was not required.

If there are any questions please feel free to contact me.

Regards,

Edward Yong
Safety, Risk, and Compliance Officer

19 July 2021

Manager, Consents Management
Greater Wellington Regional Council
PO Box 11646
WELLINGTON

Dear Consents Management Manager,

Overflow Discharge from the Western Treatment Plant

Apologies for the tardiness of this report. There were several issues occurring at the same time during this period and the final report was missed.

Condition 6 of both resource consent WGN060283 [25227] and WGN060283 [35674] and Condition 5 of resource consent WGN060283 [35675] state that notification is required to update the Manger, Environmental Regulation, Wellington Regional Council about any overflow discharges. This letter serves as notification of the consented overflow discharges from the Western Treatment Plant. The discharges were due to the heavy rainfall in the catchment.

The following is a summary of the parameters monitored during the overflow discharge:

Parameter	WWTP	Stream Discharge	Coastal Discharge
Start	--	30/11/2020 20:44	30/11/2020 20:43
End	--	1/12/2020 2:25	1/12/2020 2:29
Duration	--	5:41:00	5:46:00
Mean Flow	324	32	125
Peak Flow	388	44	171
Discharge Volume	--	663	2598

Table 1: Discharge Monitoring Parameters

Resource consent WGN060283 [25227] applies when the plant inlet flow rate is greater than 190L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the coastal outfall pipeline when the discharge period has been over two (2) hours. Resource consent WGN060283 [35675] applies only when the plant inlet flow rate is greater that 390L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the Karori Stream when the discharge period has been over one (1) hour.

Since the recent discharge meets the criteria, a sample was collected. The following are the analytical results that have been received for the sample:

Veolia Water Ltd.
A: 127 Stewart Duff Drive, Rongotai, Wellington, New Zealand, 6003
T: 0800-928-371 W: **www.veolia.com.au**

Date	pH	Total Suspended Solids	Total BOD_5	Faecal Coliforms	Oil/Grease
dd/mm/yyyy	-	g/m^3	g/m^3	cfu/100mL	g/m^3
01/12/2020	6.8	28	19	310,000	15

Table 2: Settled and Milli-Screened Effluent Sample

Condition 8 of resource consent WGN060283 [25227] states that 2 representative water samples are collected from knee deep water at 4 different locations along the Wellington South Coast coastal marine area when the discharge exceeds ten (10) hours. The samples must be collected within 24 hours of the discharge commencing and 12-48 hours after the discharge has ceased.

The discharge did not meet the requirements for this condition therefore no samples were collected.

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 8 states that a representative grab sample of the treated effluent be collected prior to entry into Karori Stream when the discharge period has been over two hours (2).

Since the recent discharge did meets this criteria, a sample was collected. The following are the analytical results:

Date	Total Suspended Solids	Ammoniacal Nitrogen	Total BOD_5	Faecal Coliforms
dd/mm/yyyy	g/m^3	g/m^3	g/m^3	cfu/100mL
01/12/2020	20	0.25	14	3,300

Table 3: Treated Effluent Sample

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 9 states that a Karori Stream sample be taken when the discharge period has been over 24 hours. Resource consent WGN060283 [35675] applies when the plant inlet flow rate is greater than 390L/s. Condition 8 states that a Karori Stream sample be taken when the discharge period has been over one (1) hour. This sample is to be repeated in two (2) hourly intervals.

Since the recent discharge did not meet this criteria, samples were not collected.

If there are any questions please feel free to contact me.

Regards,

Edward Yong
Safety, Risk, and Compliance Officer

21/06/2021

Manager, Consents Management
c/o Joshua Knowles
Greater Wellington Regional Council
PO Box 11646
WELLINGTON

Dear Joshua,

Overflow Discharge from the Western Treatment Plant

Condition 6 of both resource consent WGN060283 [25227] and WGN060283 [35674] and Condition 5 of resource consent WGN060283 [35675] state that notification is required to update the Manger, Environmental Regulation, Wellington Regional Council about any overflow discharges. This letter serves as notification of the consented overflow discharges from the Western Treatment Plant. The discharges were due to the heavy rainfall in the catchment.

The following is a summary of the parameters monitored during the overflow discharge:

Parameter	WWTP	Stream Discharge	Coastal Discharge
Start	--	31/05/2021 14:17	31/05/2021 14:15
End	--	1/06/2021 3:59	1/06/2021 4:15
Duration	--	13:42	14 hours
Mean Flow	188L/s	15L/s	52L/s
Peak Flow	374L/s	36L/s	168L/s
Discharge Volume	--	170m^3	832m^3

Table 1: Discharge Monitoring Parameters

Resource consent WGN060283 [25227] applies when the plant inlet flow rate is greater than 190L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the coastal outfall pipeline when the discharge period has been over two (2) hours. Resource consent WGN060283 [35675] applies only when the plant inlet flow rate is greater that 390L/s. Condition 7 states that a representative grab sample is taken of the settled, milli-screened effluent prior to the entry into the Karori Stream when the discharge period has been over one (1) hour.

Since the recent discharge meets the criteria, a sample was collected. The following are the analytical results that have been received for the sample:

Veolia Water Ltd.
A: 127 Stewart Duff Drive, Rongotai, Wellington, New Zealand, 6003
T: 0800-928-371 W: **www.veolia.com.au**

Date	pH	Total Suspended Solids	Total BOD_5	Faecal Coliforms	Oil/Grease
dd/mm/yyyy	-	g/m^3	g/m^3	cfu/100mL	g/m^3
31/05/2021	7.1	29	17	330,000	6.8

Table 2: Settled and Milli-Screened Effluent Sample

Condition 8 of resource consent WGN060283 [25227] states that 2 representative water samples are collected from knee deep water at 4 different locations along the Wellington South Coast coastal marine area when the discharge exceeds ten (10) hours. The samples must be collected within 24 hours of the discharge commencing and 12-48 hours after the discharge has ceased.

The discharge did not met the requirements of this condition. The discharge flow was internment during the entire period. Therefore samples were not collected.

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 8 states that a representative grab sample of the treated effluent be collected prior to entry into Karori Stream when the discharge period has been over two hours (2).

Since the recent discharge did meets this criteria, a sample was collected. The following are the analytical results:

Date	Total Suspended Solids	Ammoniacal Nitrogen	Total BOD_5	Faecal Coliforms
dd/mm/yyyy	g/m^3	g/m^3	g/m^3	cfu/100mL
31/05/2021	200	5.1	170	29000

Table 3: Treated Effluent Sample

Resource consent WGN060283 [35674] applies when the plant inlet flow rate is greater than 190L/s. Condition 9 states that a Karori Stream sample be taken when the discharge period has been over 24 hours. Resource consent WGN060283 [35675] applies when the plant inlet flow rate is greater than 390L/s. Condition 8 states that a Karori Stream sample be taken when the discharge period has been over one (1) hour. This sample is to be repeated in two (2) hourly intervals.

Since the recent discharge did not meet the criteria, a sample was not required.

If there are any questions please feel free to contact me.

Regards,

Edward Yong
Safety, Risk, and Compliance Officer