Hahei WWTP

Annual Report – April 2020 to March 2021
Resource Consent 135636

12th April 2021

RE: HAHEI WASTEWATER TREATMENT PLANT
Annual Report – 2020-21
Resource Consents: 135636

This report covers the compliance of the Hahei WWTP discharge to the Wigmore Stream with the operational resource consent requirements. The time period for this report is the 1st of April 2020 until the 31st of March 2021.

Please find attached the supporting monitoring data for the daily effluent disposed and the analytical data compliance for the period above as Appendix A.

Recommendations

Review the SCADA flow data to provide accurate online figures for the daily influent and effluent discharge volumes to reduce the reliance on field data. Additionally, continuous flow data for the effluent should be made available to TCDC's online data management system for inclusion in the consent reporting.

To provide the best possible total nitrogen reduction across the aeration and retention ponds, the aeration set-up should be looked into to provide the optimal conditions in the retention pond for denitrification to occur. The aerators run in DO control for the majority of the year apart from the peak period when they are run in manual due to the additional loading. The retention pond aerator start and stop set-points have been reduced. The balance between aerobic treatment for ammonia and BOD and anaerobic denitrification will be monitored over the next few months. The reduction in DO set-points should also reduce the carbon footprint of the WWTP.

Hahei WWTP		
Total Influent Flow	27,792	m3
Maximum Effluent Flow	355	m3
Average Effluent Flow	178	m3
Total Effluent Flow	31,945	m3

Condition 3: *The treatment plant and discharge to the Wigmore Stream shall be managed and operated by an appropriately trained operator.*

This condition is **compliant**.

The site operators has a level 4 qualification in wastewater treatment and over 10 years experience within wastewater operations.

Condition 5: *The maximum volume of treated wastewater discharged to the Wigmore Stream shall not exceed 700 cubic metres in any 24 hour period.*

This condition is **compliant**.

Figure 1 below shows the daily effluent discharge volume for the compliance period. Please note only manual field data can be used for the effluent volumes at Hahei WWTP due to the SCADA data being inaccurate when compared to the on-site flow meter. Therefore, some effluent volumes may have been missed. However, it is believed to be unlikely that the 700 m^3/day limit was exceeded. The maximum discharge volume recorded was 355 m^3.

Condition 6: *The maximum discharge rate of treated wastewater to the Wigmore Stream shall not exceed 8.1 litres per second.*

This condition is **non-compliant**.

Instantaneous flow rate data is not available for the site through SCADA at present. Unfortunately, neither is discharge hours data to be able to calculate an average discharge rate.

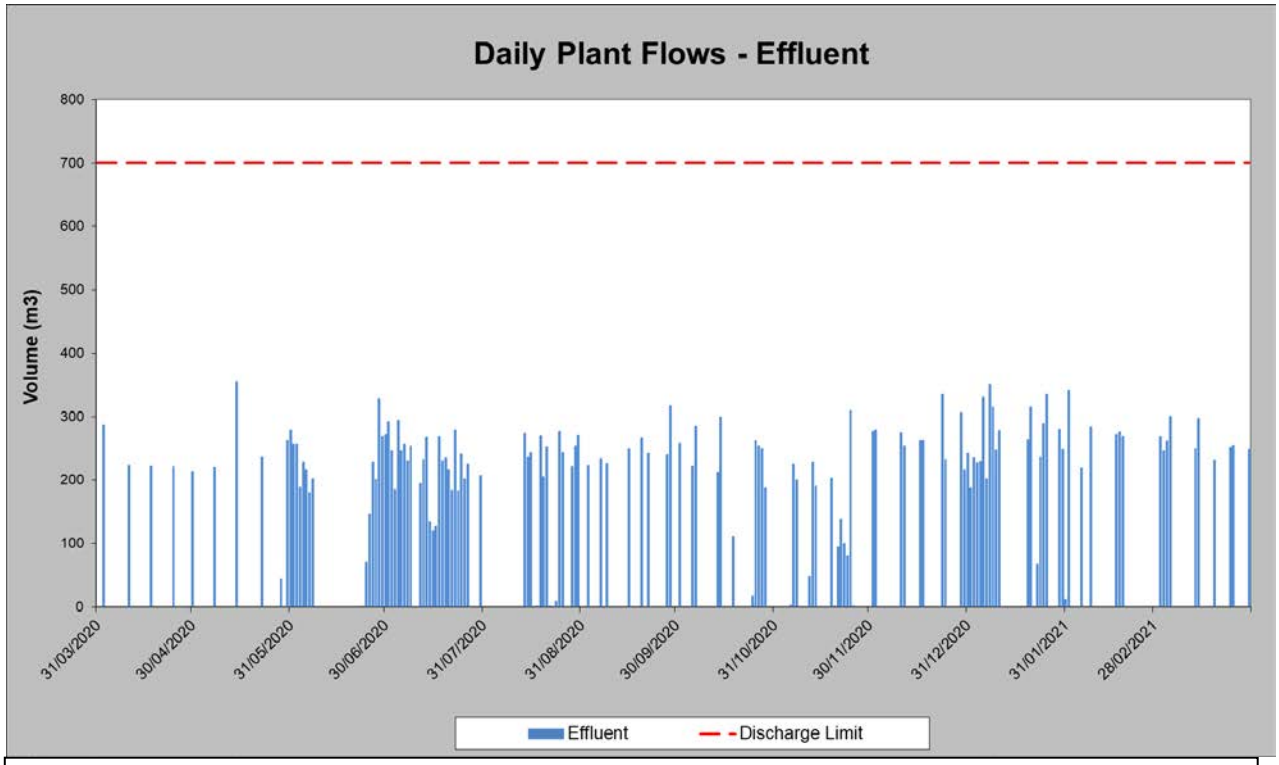

Figure 1 – Daily WWTP Discharge Volume 2020-21

Condition 7: *The consent holder shall ensure that all waste entering, and treated in, the Hahei wastewater treatment plant, goes through all stages of treatment available at the plant prior to discharge. This includes the micro filtration unit.*

This condition is **compliant**.

There were no periods in the 2020 to 2021 compliance year where flows bypassed the MFU treatment.

Condition 8: *The following limits shall apply to the discharge to the Wigmore Stream from the commencement of this resource consent:*

Parameter	90 percentile, *not more than one sample in each preceding 10 samples shall exceed:*	Running average, *over any consecutive 10 samples shall not exceed:*
a) Suspended solids (g/m^3)	20	10
b) Carbonaceous biochemical oxygen demand (cBODs) (g/m^3)	20	10
c) *Escherichia coli* (cfu/100 mL)	20	10
d) Total ammoniacal nitrogen (g/m^3)	15	10
e) Total Kjeldahl Nitrogen (g/m^3)	20	15
f) Total Phosphorus (g/m^3)	20	14

This condition is **non-compliant**.

	90th Percentile	Running Average
Suspended solids (g/m3)	3.4	2.0
cBOD5 (g/m3)	7.9	4.2
Escherichia coli (cfu/100 mL)	**37.0**	9.7
Total Ammoniacal nitrogen (g/m3)	**18.7**	9.3
Total Kjeldahl Nitrogen (g/m3)	19.7	10.4
Total Phosphorus (g/m3)	11.5	9.5

Historic high e.coli results has caused the increase in the 90th percentile seen above. The highest e.coli count recorded during the compliance period was 3.3 cfu/100ml while most of the results were below the level of detection.

Elevated ammonia results caused by the removal of sludge from the aeration pond and the associated disturbance were recorded in October and November 2020. Aeration was increased in reaction to the elevated results and the ammonia results reduced. Peak loading over the new year caused an elevated ammonia result in early January 2021. Since the end of January 2021, the ammonia sample results for the effluent have been below 1.0 mg/L.

Please see Appendix A for the compliance data.

Condition 11: *A flow meter shall be installed to record, on a continuous basis, the quantity of effluent discharged on a daily basis. The device shall have a reliable calibration to water flow and shall be maintained to an accuracy of +/- 5%. Access to the meter shall be made available to the staff and agents of the Waikato Regional Council at all reasonable times.*

This condition is **compliant**.

A flow meter quantifying the effluent discharge is installed on the discharge to the Wigmore Stream. A calibration of the flowmeter was performed in September 2017. The calibration verification certificate is attached as Appendix B.

Condition 14: *Within 3 months of the commencement of this consent the consent holder shall install and monitor a flow recorder which shall, as a minimum, record flow in the Wigmore Stream in litres per second every 15 minutes at a suitable location upstream of the discharge authorised by this consent. The purpose of the flow monitoring is to establish a reliable correlation to flows in the Opitonui River. The datalogger shall be linked by telemetry to the Waikato Regional Council. It shall be cross referenced to the Waikato Regional Council flow recorder on the Opitonui River downstream of Awaroa Stream confluence (Waikato Regional Council site number 660.1, map reference nztm 1832431e 5926826n). The necessity for flow recording may be modified at any time*

following approval in writing from the Waikato Regional Council following a request in writing from the consent holder to do so. The approval process will consider a written report by the consent holder with data and explanation to show that sufficient flow monitoring of the Wigmore Stream has been obtained to have a scientifically reliable correlation to flows in the Opitonui River, or which demonstrates the inability to obtain a scientifically reliable correlation following the collection of sufficient flow data. The minimum period of flow monitoring shall include a summer/autumn period with a prolonged low flow recession.

This condition is **compliant**.

It is understood that a temporary flow monitoring station was installed upstream of the WWTP. Although from a report produced by Scottech in February 2019, the electronic monitoring equipment is not present. This report is included as Appendix C. The author is unsure whether the approval process, correlating the flow data to the Opitonui River has been completed.

Condition 15: *In addition to the flow monitoring required by condition 14 of this consent, the consent holder shall undertake manual low-flow gauging in the Wigmore Stream at least once during each calendar year when flows are at a seasonal summer low and the flow recorder site is operational. Where there is a prolonged period of summer low flows, the consent holder will repeat the low-flow gauging to ensure data at lower stream flows are measured. The low-flow gauging shall be undertaken at a suitable location upstream of the discharge authorised by this consent at or near the flow recorder site. The purpose of the low-flow gauging is to verify the flow records measured by the flow recorder. The low-flow gauging shall be undertaken by an appropriately qualified and experienced person. A copy of the results of the gauging(s) shall be forwarded to Waikato Regional Council with the written report required in condition 14 and 21 of this consent. The requirement for manual stream flow monitoring under this condition can cease when approval in writing from the Waikato Regional Council under condition 14 has been provided.*

This condition is **compliant**.

Low flow gauging within the Wigmore Stream was not conducted during the compliance year as the flow gauging station is not operational (see condition 14).

Condition 16: *Discharge and surface water monitoring:*

The consent holder shall measure and characterise the quality, quantity and variability of treated effluent being discharged to the Wigmore Stream and the effects of the discharge on the quality and variability of surface water. To this end, the consent holder shall undertake sampling and analysis of the discharge and surface water as follows:

Frequency	Sample type and/or location	Parameter
a) Every 15 minutes	Wigmore Stream Refer to condition 14.	• Water level • Instantaneous flow
b) Daily	Treatment Plant	• Rainfall
c) Daily	Discharge	• Volume • Instantaneous peak flow • Average flow
d) Weekly - during the period from the start of the third week of December to the start of the third week of February - monthly otherwise.	• Inlet of MFU • Discharge, following all treatment stages and prior to entering the Wigmore Stream • Wigmore Stream 50 metres upstream of discharge • Wigmore Stream downstream at Pa Road bridge Downstream samples to be collected within the period 1 hour either side of local low tide during daylight hours and while discharge is operating.	• Total Ammoniacal Nitrogen • *Escherichia coli* • Enterococci • Conductivity • pH • Sample date and time • Time of low tide occurrence closest to sample time
e) Monthly – to coincide with d)	• Inlet of MFU • Discharge, following all treatment stages and prior to entering the Wigmore Stream • Wigmore Stream 50 metres upstream of the discharge • Wigmore Stream downstream at Pa Road bridge Downstream samples to be collected within the period 1 hour either side of local low tide during daylight hours and while discharge is operating.	• $cBOD_5$ • Nitrate Nitrogen • Suspended solids • Total Kjeldahl Nitrogen • Soluble Reactive Phosphorus • Total Phosphorus by Persulphate Digestion • Turbidity • Sample date and time • Time of low tide occurrence closest to sample time
f) Once per year in January or February	• Wigmore Stream 50 metres upstream of the discharge • Wigmore Stream downstream at Pa Road bridge Refer to condition 19 for sampling and assessment methodology.	• Aquatic Macroinvertebrate assessment • Habitat and aquatic plant assessment • Sample date and time • Time of low tide occurrence closest to assessment time
g) At least once per year – to coincide with summer low flows	Wigmore Stream Additional gauging each summer may be required if low flow conditions are prolonged, to capture a series of low flow records. Refer to condition 15.	• Flow (via flow gauging) • Sample date and time
h) Once every five years in January or February, commencing 2019	• Wigmore Stream 50 metres upstream of the discharge • Wigmore Stream downstream at Pa Road bridge	• Fish populations

This condition is **non-compliant**.

At present, it is understood no flow gauging exists on the Wigmore Stream. This means the low flow gauging was also not conducted. Additionally, instantaneous peak flow data for the effluent discharge is currently not available through TCDCs data management system.

A scheduled monthly sample in June 2020 was missed as the MFU was not operational at the time due to the desludging work taking place on site. The upstream and downstream environmental samples were still taken.

Conductivity and pH data is missing for the MFU inlet samples for August, September, October and November 2020. This is due to a change in the data collection system during this period.

The fish population survey was not due during the compliance period. The macroinvertebrate and habitat survey was conducted in January 2020, the data report is attached as Appendix D. Additional surveys have been conducted in February 2021, however the report for this survey work is not yet available.

Condition 17: All samples taken in relation to monitoring under this consent shall be collected by a suitably qualified and experienced person(s) with relevant training in the sampling and transporting of water quality samples and in accordance with the monitoring implementation plan titled "wastewater sampling at hahei wwtp and wigmore stream" by united water, dated 1-04-2009 (Waikato Regional Council document number 1472702), or any subsequent update. This plan shall detail methods and map locations for how, when and where sampling will take place. An updated monitoring implementation plan shall be provided to the Waikato Regional Council within three months of commencement of this consent, and at two yearly intervals thereafter, or more often if any method or location changes. The Waikato Regional Council shall be provided with an updated copy of the monitoring implementation plan within one month of any update to the plan.

This condition is **compliant**.

An updated Monitoring Plan for Hahei WWTP was produced in December 2020. This is attached as Appendix E.

Condition 20: *Periodic reporting*

The consent holder shall provide to the Waikato Regional Council a data report by 1 December each year that this consent is current. This report shall include all data collected under condition 16 of this consent for the period 1 April to 30 September of the current year and shall identify any non-compliance within that period.

This condition is **non-compliant**.

The report covering the period April 2020 to September 2020 was not supplied in December 2020. The data for this report is included along with the annual report as Appendix A. On-going issues with TCDC's data management system have caused a delay in the automatic periodic reporting being completed.

Condition 21: *The consent holder shall provide to the Waikato Regional Council a written monitoring report by 1 June each year that this consent is current for the 12 month period from 1 April of the preceding year to 31 March of the current year. As a minimum this report shall include the following:*

A. A summary of the monitoring results required by condition 16 of this consent for the 12 month period from 1 April of the preceding year to 31 March of the current year and a critical analysis of the information in terms of compliance and environmental effects;

B. A comparison of data with previously collected data identifying any emerging trends;

C. Comment on compliance, and any reasons for non-compliance or difficulties in achieving compliance, with condition 8 of this consent;

D. Comment on any works that have been undertaken, or that are proposed to be undertaken in the upcoming year, to improve the environmental performance of the treatment and/or disposal system;

E. Report on and discuss any complaints received regarding the treatment and/or discharge of treated effluent; and

F. Any other issues considered important by the consent holder.

This condition is **compliant**.

Appendix A contains the compliance data for the compliance period. This is includes historic trends.

Work conducted on the MFU in early 2019 has improved the effluent quality and this is seen as a reduction in the effluent biological count results. The e.coli and enterococci results have rarely been above the detection limit during the compliance period and far below the upstream sample results.

Following the pond sludge removal in June, July, August and September 2020 and the period after where the ammonia levels were elevated due to the centrate returns and sludge layer disturbances, the ammonia results have been lower than previous years.

Spikes in the effluent nutrient concentrations are seen over the peak period, this includes ammonia, TKN, phosphorus, cBOD and SS. Over the Christmas and New Year period the pond loading increases due to the population increase in the town.

Nitrate concentrations have increased slightly over the compliance period compared to other years. This could be due to the additional aeration in the pond to reduce the additional ammonia loading from the desludging and centrate returns. This aeration may have lead to lower anaerobic conditions in the retention pond and reduced denitrification.

There is a general pattern to the phosphorus trends of lower effluent concentrations during the winter and higher effluent concentrations during the warmer months.

The results for the Wigmore Stream samples show the effluent discharge is not having a negative impact on the environmental nutrient and bacteriological concentrations. In fact, the upstream samples often have higher results than the downstream samples, especially for enterococci and e.coli.

An effort has been made to use a consistent unit for the conductivity results over the compliance period; microsiemens per centimetre has been chosen. This has caused some difference between the newer and the old results which were a combination of micro and mili siemens per meter and centimetre. As seen in the trends.

Condition 22: *The consent holder shall provide to the Waikato Regional Council an ecological assessment report by 1 June every two years for the duration of this consent. This report shall be prepared by a suitably qualified person or persons with relevant training in ecological monitoring and assessment. As a minimum this report shall include the following:*

A. A summary of the ecological monitoring and water quality results required by condition 16 for the preceding two years;

B. A comparison of data with previously collected data identifying any emerging trends;

C. A critical analysis of the current ecological health of the Wigmore Stream, the potential causes of any degradation of the stream, the effects of the discharge authorised by this consent on the Wigmore Stream and downstream coastal waters;

D. Any other issues considered important by the ecologist.

This condition is **compliant**.

An ecology report was produced in 2019. A data summary report of the ecology survey conducted in January 2020 is included as Appendix D. The 2021 monitoring has been completed and a two year report will be provided in 2021.

Condition 23: *Contingency plan*

In the event of any bypasses, other extraordinary events or failure of any critical part of the treatment plant, the consent holder shall manage the treatment plant and discharge to the Wigmore Stream in accordance with the contingency plan titled "Hahei wastewater treatment plant contingency plan 2015" by Veolia (Waikato regional council document number 3584298 and 3584310), or any subsequent update. An updated plan shall be provided to the Waikato regional council by 1 June 2018, and at three yearly intervals thereafter. The consent holder shall engage appropriately experienced persons to compile any update to the contingency plan, and it shall identify measures and notification protocols to be undertaken by the consent holder that will take into account any potential adverse effects on the Wigmore Stream and users, including but not limited to ecological effects, downstream recreational use, and the medical officer of health.

This condition is **compliant**.

An updated Hahei WWTP contingency plan was produced in late 2020. This is included as Appendix F.

Condition 24: *Management plan*

The consent holder shall provide the Waikato Regional Council with a management plan which details the procedures that will be implemented to operate in accordance with the conditions of this resource consent and the procedures that will be put into place to maximise wastewater treatment and minimise odour production. This plan shall be lodged with the Waikato Regional Council within 3 months of the commencement of this consent, and shall be reviewed and updated as a minimum annually. The plan shall address, but may not be limited to, the following:

A. A description of the entire treatment and disposal system facility and how it is operated;

B. A description of routine maintenance procedures to be undertaken;

C. An outline of the methods to be utilised to monitor the treatment plant in an operational sense including: monitoring of influent waste water and monitoring of treatment performance;

D. A description of the methods to be used to ensure that sampling of the discharge as required by condition 16 of this consent is representative of overall discharge quality;

E. Specific management procedures for the efficient functioning of the treatment system including micro filtration unit, including measures to ensure compliance with condition 8 of this consent relating to discharge quality parameters;

F. Procedures for recording routine maintenance and all repairs that are undertaken;

G. Contingency measures in place to deal with unusual events;

H. Chain of command and responsibility, including contact details;

I. Other actions necessary to comply with the requirements of this resource consent;

J. Procedures for improving and/or reviewing the management plan.

This condition is **compliant**.

The Hahei WWTP Management Plan has been updated in December 2020. I copy is attached as Appendix G.

Condition 26: *Unauthorised discharge*

The consent holder shall notify the Waikato Regional Council as soon as practicable, and as a minimum requirement within 24 hours, of any discharge to Wigmore Stream from a source that has bypassed any part of the treatment system, or any discharge to the redundant disposal beds and/or redundant storage pond. The consent holder shall, within 7 days of the discharge occurring, provide a written report to the Waikato Regional Council, identifying the extent of the discharge, possible causes, steps undertaken to remedy the effects of the discharge and measures that will be undertaken to ensure future compliance with this consent.

This condition is **compliant**.

No discharge to the grass plots has been conducted in the 2020/21 compliance period.

Condition 27: *Complaints*

The consent holder shall maintain and keep a complaints register for all complaints, including discharge, water quality and odour complaints regarding operations at the site received by the consent holder. The register shall record:

A. The date, time and duration of the event that has resulted in a complaint,

B. Any corrective action undertaken by the consent holder in response to the complaint, including actions taken to prevent similar events in the future.

C. The location of the complainant when the event was detected,

D. The possible cause of the event, and

E. The weather conditions and wind direction at the site when the event allegedly occurred.

This condition is **compliant**.

TCDC hold the complaints register for Hahei WWTP.

Condition 28: *The register outlined in condition 27 shall be available to the Waikato Regional Council at all reasonable times. Waikato regional council shall be informed of complaints received by the consent holder which may infer non-compliance with the conditions of this resource consent to the Waikato Regional Council within 24 hours of the complaint being received. In addition, the consent holder shall provide written information on the incident including all of the details required by (a) to (e) of condition 27 of this consent, which shall be forwarded to the Waikato Regional Council within 5 days of the complaint being received.*

This condition is **compliant**.

TCDC hold the complaints register for Hahei WWTP.

Condition 29: *Wigmore Stream mouth*

The consent holder shall be responsible for ensuring that the Wigmore Stream, from the treated wastewater discharge point to its mouth, is kept clear of debris and that the stream mouth is not blocked by sand, to the extent that the flow of the Wigmore Stream is unimpeded into the coastal marine area. The consent holder's obligations in respect of this condition are limited to the works that can be undertaken without the need for resource consent under the relevant rule(s) of the Waikato regional coastal plan.

This condition is **compliant**.

It is understood the Wigmore Stream mouth has been cleared multiple times during the consent period.

Condition 30: *The consent holder shall implement the treatment plant upgrade works detailed in the Technical Memo titled "Hahei WWTP Consent Ammonical Nitrogen Reduction" by Harrison Grierson, dated 14 June 2017 (Waikato Regional Council document number 10628287), or equivalent upgrades, to ensure the wastewater discharge limits in condition 8 are met. The works shall include, as a minimum, installation of additional aeration in the Aeration Pond. These works shall be fully implemented within one year of the commencement of this consent.*

This condition is **compliant**.

Additional aeration was installed at the Hahei WWTP in both ponds in 2017.

Condition 31: *The consent holder shall provide a written report on or before the fifth and tenth anniversaries of the commencement of this consent that shall outline:*

A. What investigations have been undertaken to date to identify the long-term strategy for wastewater treatment and disposal options at Hahei upon the expiry of this consent,

B. What investigations have been undertaken or identified in relation to potential effects of disposal options being considered for wastewater at Hahei upon the expiry of this consent,

C. What consultation has been undertaken in relation to potential treatment and disposal options for wastewater at Hahei upon the expiry of this consent.

This condition is **compliant**.

The first of these reports is due in 2022.

Appendix A. Hahei WWTP Annual Report Compliance Data
Appendix B. Effluent Discharge Flow Meter Calibration Verification Report Sep 2017
Appendix C. Scottech Flow Gauging Report Feb 2019
Appendix D. Ecological Data Report Jan 2020 Survey
Appendix E. Hahei WWTP Monitoring Plan 2020
Appendix F. Hahei WWTP Contingency Plan 2020
Appendix G. Hahei WWTP Management Plan 2020