NAPIER WASTEWATER TREATMENT PLANT

Independent Evaluation of Performance
June 2021

Prepared for:

Napier City Council
Private Bag 6010
Napier 4142

SLR Ref: 710.30134-R01
Version No: -v0.6
July 2021

PREPARED BY

SLR Consulting NZ Limited
Company Number 2443058
Level 4, 12 O'Connell Street
Auckland 1010 New Zealand

T: 0800 757 695
E: auckland@slrconsulting.com www.slrconsulting.com

BASIS OF REPORT

This report has been prepared by SLR Consulting NZ Limited (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Napier City Council (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
710.30134-R01-v0.6	1 July 2021	Neville Tawona and Dr. Lisa Hack	Peter Cupitt	Peter Cupitt
710.30134-R01-v0.6	29 June 2021	Neville Tawona and Dr. Lisa Hack	Peter Cupitt	Peter Cupitt
710.30134-R01-v0.5	22 June 2021	Dr. Lisa Hack and Neville Tawona	Draft	
710.30134-R01-v0.4-v0.2	22 June 2021	Dr. Lisa Hack and Neville Tawona	Draft	

EXECUTIVE SUMMARY

Approval for marine discharge was granted by Hawkes Bay Regional Council via the 2012 Resource Consent Coastal Permit (RCCP) (No. CD090514W (now referred to as AUTH-118503-02)). The RCCP had 37 conditions which described requirements for effluent quality and environmental monitoring at the Napier Wastewater Treatment Plant (WWTP). The RCCP was reviewed on 30 May 2019, taking effect on 02 October 2019 with Conditions 38 - 41 added in relation to updating the Quantitative Microbial Risk Assessment (QMRA). Conditions 38-41 relating to the Quantitative Microbial Risk Assessment (QMRA) have been addressed in a separate report to Napier City Council.

Conditions 1 to 5 relate to maximum discharge via the ocean outfall, and diffusion.

All conditions relating to flow rates and diffusion have been complied with.

Conditions 6 to 16 describe the approved treatment methods and loadings; concentration and load limits for pollutants and analytes at discharge; and toxicity effects of the combined wastewater discharged at Hawkes Bay.

The treatment process complies with the approved methods, however annual average loading rates to the BTF filter media consistently exceeded the RCCP limit of 0.6 kg/m^3 media/day. The exceedances have been linked to industrial flows from the Pandora Industrial Area. Notwithstanding the higher loading rates to the BTF plant, the $cBOD_5$ removal efficiency of the BTF system is high, indicating that the biological treatment process is performing adequately. It is understood the design capacity of the BTF is 50% higher which confirms the results under these conditions.

Funding has been allocated over a three-year period to investigate additional treatment options for both the Pandora and Awatoto tradewaste customers in addition to re-routing the Awatoto tradewaste influent to the headworks of the WWTP. Masterplanning for the WWTP is also being undertaken to look at the present level of treatment, account for potential future treatment levels in conjunction with projected population growth, sea level rise and climate change over the next thirty years.

Concentrations of pollutants in combined wastewater complied with the RCCP limits except for Total Ammonia-N and Zinc (Condition 7). NCC increased engagements with tradewaste customers along Pandora Industrial Area following the Total Ammonia-N exceedances (note that these exceedances were recorded twice on isolated events). Elevated zinc concentrations were recorded on a few occasions in 2019 and 2020 and NCC will continue to monitor zinc concentrations to assess any ongoing issues with this analyte.

Condition 8 relates to the analytes $cBOD_5$, TSS, TFO&G and pH.

pH values recorded over the monitoring period were 100% compliant. Both the average TSS loading rate (based on a 12 month rolling average) and maximum TSS loading rate exceeded the consent limits. Average $cBOD_5$ loads of effluent discharged (based on a 12 month rolling average) complied with the limit, however the maximum $cBOD_5$ daily loading rate in the final effluent exceeded the $cBOD_5$ consent limit on a few occasions. The maximum daily monitored TFO&G load exceeded the limit on a few occasions. The average TFO&G load (based on a 12 month rolling average) exceeded the consent limit in November 2020. The high TSS has been attributed to high rainfall events as well as potential inputs from Awatoto Industries, while the elevated $cBOD_5$ and TFO&G loads have been largely linked to operations discharging into the Awatoto industrial line.

EXECUTIVE SUMMARY

Conditions 9 to 16 relate to the outfall pipe and the surrounding environment.

> All conditions relating to the outfall pipe and the surrounding environment have been met. It is also noted that the repair to the leak in the outfall pipeline identified in early 2020 at 630m offshore was successfully completed on 25 October 2020. The leak at 700m (identified in 2018) was completed on 01 February 2021.

Conditions 17 to 28 outline requirements for monitoring environmental performance of the WWTP.

> All conditions relating to monitoring performance have been met. From the quarterly BTF performance monitoring, significant fluctuations were observed in the TSS, cBOD5 and oil and grease concentrations in the raw wastewater which could be attributed to the industrial/trade waste contributions. From a trend analysis of the quarterly results, data indicated potential reduction on BTF treatment performance, however it is recommended that NCC conduct further investigations particularly an assessment of the incoming wastewater quality from industrial trade waste customers to validate the assumption. There are a number of other factors that could influence biological treatment capacity, which could be investigated as part of a plant-wide process capability and capacity assessment.

Conditions 29 to 41 relate to various matters including signage at the ocean diffuser advising that 'shellfish unfit for human consumption', the appointment of a contact person at the WWTP, preparation of management plans, availability of records and reporting, complaints procedures, the continuation of liaison through the Kaitiaki Liaison Group (KLG) and updating the Quantitative Microbial Risk Assessment (QMRA).

> Conditions 29 to 37 have been complied with. Commentary has also been provided for Condition 38 and 39.

The capability of the Napier WWTP to comply with the conditions of the Resource Consent Coastal Permit (RCCP) is in part reliant on the tradewaste customers complying with their discharge licence limitations. Random impromptu sampling is necessary within the Awatoto and Pandora Industrial Zones to identify businesses failing to comply with their discharge limitations. In lieu of licence revocation threats and penalties for repeat offenders, non-complying tradewaste customers could be directed to engage wastewater specialists to advise on enhancements their treatment capability to satisfy their discharge obligations.

Although the Napier WWTP is currently complying with the operational requirements imposed by Hawkes Bay Regional Council, the capacity to accept additional loads in line with projected population and trade waste growth, sea level rise and climate change may not be possible without process enhancements. Scrutiny of the existing performance may reveal fundamental changes to the process train may improve the robustness, longevity, and performance of the existing WWTP. This may include re-routing of flows, blending, chemical dosing or supplementary processes which focus on the analytes of concern.

The vulnerability of discharge compliance is also affected by the quality of the Awatoto tradewaste effluent which bypasses the WWTP. The master planning may investigate the merits of diverting this influent to the inlet works or to a supplementary process train or installing real time inline sensors with 4G capability to alert of non-compliances which initiates action.

ABBREVIATIONS

ANZECC	Australian and New Zealand Environment Conservation Council
BOD	Biological Oxygen Demand
BTF	Biological Tricking Filter
$cBOD_5$	Carbonaceous Biochemical Oxygen Demand
DO	Dissolved Oxygen
NTU	Turbidity
RCCP	Resource Consent Coastal Permit
TFO&G	Total Fats Oils and Grease
TSS	Total Suspended Solids
WWTP	Wastewater Treatment Plant
QMRA	Quantitative Microbial Risk Assessment

CONTENTS

CONTENTS

CONTENTS

CONTENTS

DOCUMENT REFERENCES

TABLES

CONTENTS

FIGURES

CONTENTS

PHOTOS

APPENDICES

1 Background and Purpose of Report

Napier City Wastewater Treatment Plant (WWTP) discharges via a marine outfall 1.5km into Hawke Bay. Approval for marine discharge was granted by Hawkes Bay Regional Council via the 2012 Resource Consent Coastal Permit (RCCP) (No. CD090514W (now referred to as AUTH-118503-02)). The RCCP had 37 conditions which describe requirements for effluent quality and environmental monitoring at the Napier Wastewater Treatment Plant (WWTP). The RCCP was reviewed on 30 May 2019, taking effect on 02 October 2019 with Conditions 38-41 added in relation to updating the Quantitative Microbial Risk Assessment (QMRA). Commentary regarding Conditions 38 and 39 relating to the Quantitative Microbial Risk Assessment (QMRA) have also been addressed.

The RCCP relates to major improvements at the WWTP which were commissioned in 2014 and include the addition of a biological trickling filter plant (BTF).

This report addresses Condition 11ii) of the RCCP, which requires an evaluation of performance of the plant each 3 years following commissioning of the biological trickling filter plant. This evaluation builds on 2018 WWTP performance evaluation report[1] and includes, but is not necessarily limited to, a summary of monitoring results, a report on non-compliances, an evaluation of information indicating trends (including favourable environmental outcomes or any emerging adverse effects); and an opportunity for public response.

2 Scope of Study and Methods

2.1 Terms of Reference for Review

The scope of activities for the SLR review is as follows:

a. Source testing and analysis data, reports and photographs related to the operation and performance of the WWTP since commissioning;

b. Summarise compliance conditions and limitations specified in the RCCP consent no. CD090514W (now referred to as AUTH-118503-02);

c. Provide commentary regarding the extent of compliance to conditions (where required);

d. Collate and tabulate existing performance based on the testing results;

e. Graphically represent the treated effluent quality relative to the RCCP limitation condition for all specified chemical and biological analytes;

f. Note any non-compliances;

g. Note any adverse or favourable environmental trends;

h. Collate the results into a concise clear report suitable for public exhibition; and

i. Identify potential mitigation options to ameliorate adverse environmental effects supplementary to the report.

[1] Napier Wastewater Treatment Plant: Independent Evaluation of Performance. SLR Report, August 2018

2.2 Information Reviewed

This study has included a desktop review of the following information made available by Napier Council:

(1) Compliance monitoring reports prepared by Hawkes Bay Regional Council for the reporting periods between July 2018 to June 2020;

(2) Benthic sediment testing results 300m, 500m and 1km from the outfall diffuser midpoint;

(3) Biological and chemical analyte concentrations of the raw wastewater, and treated effluent;

(4) Annual performance monitoring reports;

(5) Aquatic toxicology reports;

(6) Napier Wastewater Outfall Technical Monitoring & Assessment Report (NCC, 2020);

(7) Review of microbial contaminant data associated with Napier wastewater outfall (NIWA, 2020);

(8) Napier City Council wastewater discharge monitoring: 2021 benthic survey and effects assessment (NIWA, 2021); and

(9) Wastewater quality data workbooks.

3 Napier City Wastewater Treatment Plant

Wastewater Treatment Plant configuration prior to 2014

Napier City's wastewater collection, treatment and disposal system is limited to the city's boundaries. Meeanee, Jervoistown, residential Awatoto, parts of Bay View and Poraiti are not included in the system. Wastewater in the serviced area is collected by gravity sewers and 44 pump stations.

Domestic non-separable wastewater is pumped from three pump stations upstream (Taradale Road, Green Meadows, and Latham Street) after which it enters in the rising tower and flows through the 1 mm aperture milliscreen.

Photo 1 Napier Wastewater Treatment Plant Milliscreen

Grit removal is via vortex grit trap and classifiers. Additional sediment is removed prior to the primary-treated wastewater being pumped over the BTF. Screen material is dewatered and disposed of at the Omarunui Landfill. Prior to commissioning of the BTF in 2014 the screened effluent was discharged directly into Hawke Bay via a 1.5 km marine outfall, which was constructed in 1973.

2014 Improvements

The Biological Trickling Filter (BTF) plant was built alongside the existing milliscreening plant in 2014. The WWTP upgrade provides a secondary treatment process that includes grit removal followed by biological treatment. It was designed to allow for further treatment stages to be added in future if required.

Wastewater is pumped to the two Biological Trickling Filters. These filters are 26m diameter concrete tanks that are 11m high. Timber flooring inside each tank supports 14 layers of welded plastic modules on which bacteria grow and feed on the effluent, transforming it into a non-offensive bacterial biomass. Sprinklers on top of each tank distribute screened wastewater onto the plastic filter media.

BTF tanks have aluminium dome roofs to contain odours. Air is recirculated within each BTF by a fan which draws air from underneath the timber floor to the top of the tank. The tanks are also fitted with extraction fans that extract air to the nearby bark bio-filters, which act as odour treatment beds.

Photo 2 Napier Wastewater Treatment Plant Biological Treatment Filters

As the final stage in the process, the treated water leaves the BTFs and flows through one of two Rakahore channels (an open channel filled with rocks) which provide spiritual cleansing before discharge via the marine outfall into Hawke Bay. An overflow basin has been constructed south of the Rakahore Channels for the purpose of containment during an emergency.

Industrial wastewater which has been pre-screened through 1 mm milliscreen at all consented industrial trade waste discharge points is also received in a separate building housing rotating screens specifically designed for trade waste flows. This tradewaste is not currently treated through the BTF – it by-passes the WWTP and combines with the treated effluent prior to discharge via the ocean outfall.

However, trade waste from the Pandora Industrial Estate is presently not received separately due to closure of that sewer line. This results in trade wastes from the Pandora Industrial Estate presently passing through the BTF.

As a proportion of the average daily discharge flows data from the past two years shows the split being 84% domestic and non-separable and 16% industrial (separated). Of the 84%, 4% is industrial non-separated, 3% of which is from Pandora Industrial (NCC pers. comm).

4 Environmental License

Approval for the discharge of treated effluent into Hawke Bay, and the associated environmental conditions, has been provided by Hawkes Bay Regional Council via Resource Consent Coastal Permit (RCCP) No. CD090514W (now referred to as AUTH-118503-02), dated 6th December 2012. The RCCP describes requirements for effluent quality and environmental monitoring in relation to improvements at the Napier Wastewater Treatment Works that became operational in 2014.

The RCCP now has 41 conditions, structured broadly as follows:

- Activity Definition – Conditions 1 to 5 – describe scope of authorised activities including an annual average discharge not exceeding 32,000m^3/d and a maximum flow rate of 1400L/s, and discharge via an ocean outfall with diffuser that effects a dilution rate of 100:1.
- Wastewater treatment and standards – Conditions 6 to 16 – describe the approved treatment methods, concentration and load limits for discharge, and toxicity effects.
- Monitoring – Conditions 17 to 28 – outline requirements for monitoring environmental performance of the WWTP
- Administrative – Conditions 29, 30 – require signage at the ocean diffuser advising that 'shellfish unfit for human consumption', and requirements for appointment of an WWTP contact person.
- Reporting – Conditions 31 to 36 – details requirements for the preparation of management plans, availability of records and reporting, and complaints procedures.
- Kaitiaki Liaison Group (KLG) – Condition 37 – requirement to continue liaison through the KLG.
- Review conditions - Conditions 38 to 41 – review of QMRA information and requirement to repeat the analysis based on updated information.

A full copy of the RCCP is provided in Appendix A of this report.

Section 5 below provides a detailed evaluation of the WWTP performance against the RCCP condition.

5 Detailed Findings

5.1 General

Napier City Council is required to comply with the RCCP from 31 August 2014, being the date for commissioning of the Biological Trickling Filter. Therefore, the analysis of WWTP performance is from September 2014 onwards. This report represents the second independent evaluation of the WWTP performance, and as a result presents a performance evaluation of the WWTP during the period between 2018 to 2021 unless otherwise stated.

5.2 Condition 2 – Provision of Discharge

5.2.1 Condition

The consent holder shall provide for the discharge as authorised by this resource consent generally in accordance with the drawings, specifications, statements of work techniques and other information supplied by the consent holder in support of the application. Where a conflict exists between the application and the conditions of this resource consent, the conditions shall prevail.

5.2.2 Analysis of data

Napier City Council (NCC) has provided for the discharge in general accordance with the application documents supplied. However, in August 2018, there were two leaks identified in the outfall pipe at 700m and 630m offshore. NCC was issued Abatement Notice EAC-20254 on the 5th of June 2020 requiring them to cease the discharge of treated wastewater from leaks in the outfall pipe. The deadline for complying with this abatement notice was the 30th of October 2020; however this date was subsequently extended several times due to a variety of reasons, including complexity of repair design and implementation, adverse weather conditions preventing repair work, COVID-19 restrictions delaying repairs and availability of the specialist dive team. The final deadline to comply with the Abatement Notice was 28 February 2021. Additionally, an Emergency Management Plan was provided to Hawkes Bay Regional Council on 30 July 2020 as required as required by the Abatement Notice.

5.2.3 Compliance

The repair to the leak at 630m was successfully completed on 25 October 2020. The leak at 700m was completed on 01 February 2021. A subsequent request to cancel the Abatement Notice was sent to Hawkes Bay Regional Council on 12 March 2021 with notice cancelled on 15 March 2021.

5.3 Condition 3 – Flow Rates

5.3.1 Condition

‘The combined domestic (including non-separable industrial) and industrial discharge shall not exceed an annual average volume of 32,000m^3/d and a maximum flow rate of 1,400L/s.

5.3.2 Source of Data

Flow data has been provided by Napier City Council in Annual Environmental Reports relating to discharge of wastewater into Hawke Bay via a marine outfall for the periods 01 July 2018 to 30 June 2019 and 01 July 2019 to 30 June 2020 recorded daily and an excel spreadsheet titled '2012 Consent Results' containing data from August 2020 to March 2021 recorded on a quarterly basis.

5.3.3 Analysis of Data

Daily flow rates of wastewater discharged by NCC in the period between July 2018 and June 2020 are shown in Figure 1. Generally, the daily discharge flow rates ranged between 200 L/s to 400 L/s, which is well below the license condition requirements for a maximum flow rate of 1,400 L/s. The highest discharge rate recorded between 01 July 2018 and 01 March 2021 was 1,073 L/s recorded on 16 October 2019. This is still below the maximum license limit.

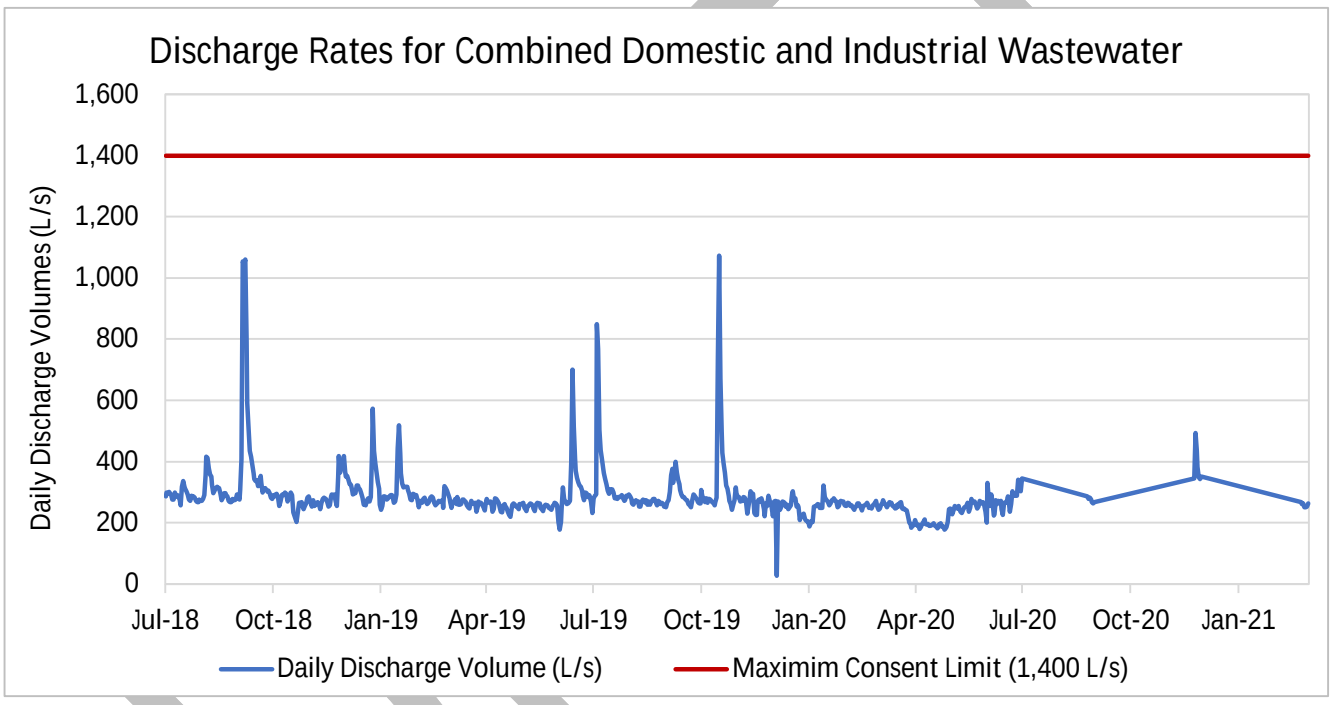

Figure 1 Daily discharges of combined effluent from the WWTP

Condition 3 also limits Annual Average Volume to 32,000 m^3/day. The annual average flow volumes of discharge are graphed as per Figure 2.

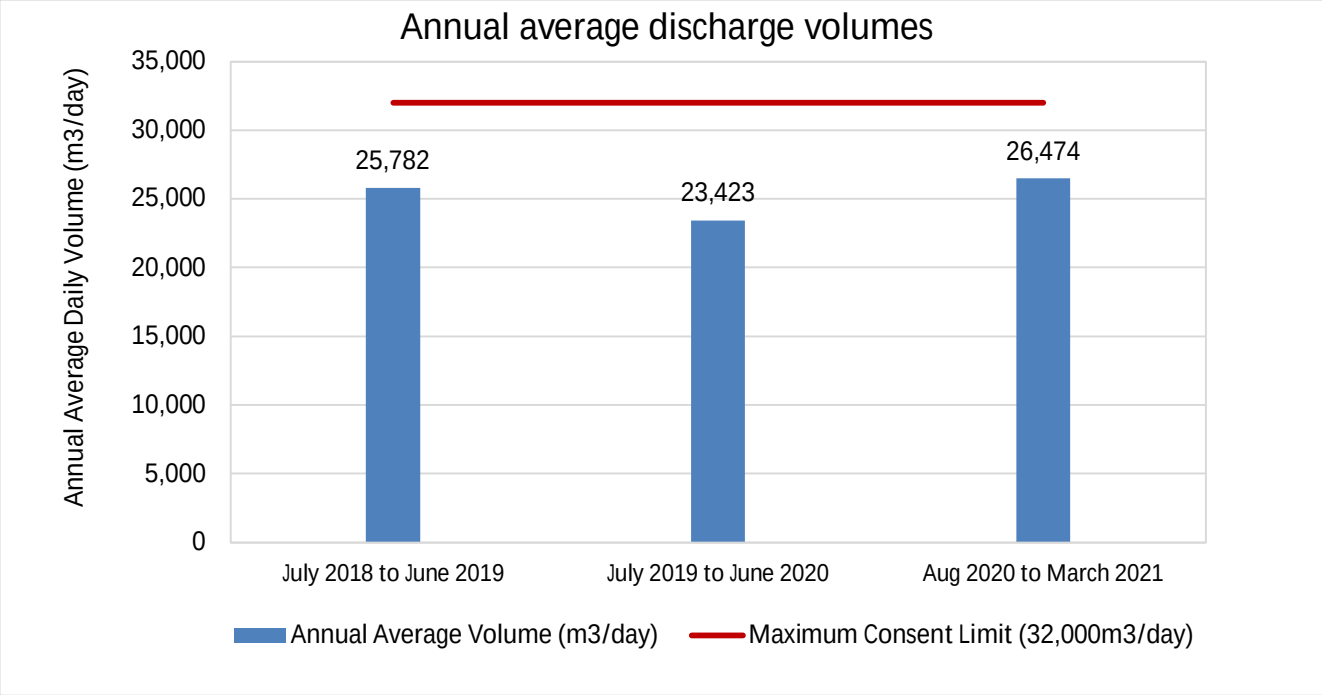

Figure 2 Annual average discharge volumes (combined flows)

5.3.4 Compliance

Complies

Daily discharge flow rates and annual average volumes of combined effluent from the WWTP were within the RCCP limits from July 2018 to March 2021. No exceedances to RCCP limits were recorded.

5.4 Condition 4 – Location of outfall structure

5.4.1 Condition

Discharge of wastewater as authorised by this resource consent shall be by way of the existing outfall structure located at Awatoto between NZTM 1938355 5615661 and NZTM 1938556 5615661.

5.4.2 Source of Data

Information on the current location of the outfall structure has been provided in the 2018/2019 and 2019/2020 annual and compliance reports.

5.4.3 Analysis of Data

It is noted that the position of the outfall diffuser has not been modified during the reporting periods 2018/2019 and 2019/2020.

5.4.4 Compliance

Complies

There was no change to the diffuser position with leaks fixed (NCC, pers. comm.).

5.5 Condition 5 – Marine Outfall Diffuser

5.5.1 Condition

'All wastewater discharged shall pass through an ocean outfall diffuser which has been designed to achieve a minimum average dilution over the boil of not less than 100:1 in slack water'.

5.5.2 Source of Data

Design drawings for the marine outfall were provided by Napier City Council.

Additional information on the dilution rate achieved by the diffuser was provided by Napier City Council in the 2018/2019 and 2019/2020 annual and compliance reports.

5.5.3 Analysis of Data

Design drawings for the marine outfall have been provided by Napier City Council, but there is not adequate detail to verify that the design would achieve a 100:1 dilution rate. However, it is understood that the design was peer reviewed and approved prior to construction and has been previously accepted by Hawke's Bay Regional Council (HBRC) as complying.

5.5.4 Compliance

Complies

The outfall design was accepted as complying by HBRC.

5.6 Condition 6 – Treatment Process and Biological Trickling Filter Loading

5.6.1 Condition

RCCP conditions for this condition have been paraphrased below. The full RCCP conditions can be found in Appendix A of this report.

From a date no later than 31 August 2014 all domestic and non-separable industrial wastewater shall be:

i. Treated to remove kuparu (human waste in an unaltered state) from the flow, with the wastewater being treated in a biological trickling filter, filled with structured media, with an annual average daily loading of carbonaceous biochemical oxygen demand (5 day test) ($cBOD_5$) that shall not exceed 0.6kg per cubic meter of media per day
ii. The plant shall include milliscreening, and grit removal prior to the BTF
iii. Prior to discharge the effluent shall be pass through a Papatuanuku channel.

5.6.2 Source of Data

The following sources of data have been used to assess compliance with this condition.

- Compliance monitoring report for the period 01 July 2019 to 30 June 2020 prepared by Hawkes Bay Regional Council

- Annual Environmental Report for period ending 30 June 2020 prepared by Napier City Council
- Annual Environmental Report for period ending 30 June 2019 prepared by Napier City Council
- Data provided by Napier City Council in an excel spreadsheet titled 'Bi-Weekly Performance Updated'
- Data provided by Napier City Council in an excel spreadsheet titled '2012 Consent Results'.

The data is for the combined wastewater discharge, including both treated and domestic wastewaters.

5.6.3 Analysis of Data

i. All domestic and non-separable industrial wastewater was treated as per the conditions of this consent with respect to a biological trickling filter process, filled with structured media. The annual average daily loading rates to the BTF (as $cBOD_5$) are graphed as per Figure 3, based on bi-weekly data recorded over the periods indicated and assuming 8,700 m^3 of filter media in the BTFS. The annual average loading rates to the BTF have exceeded the consent limit during the period 03 July 2018 to 27 June 2019 and the period between 02 July 2020 to 04 May 2021. During the period 09 July 2019 to 30 June 2020, the annual average loading rates to the BTF was 0.55 kg/m^3 of media/day which was lower but near the consent limit of 0.6 kg/m^3 of media/day. The raw $cBOD_5$ concentrations, daily volumes, and $cBOD_5$ loading rates per m^3 of filter media (assuming 8,700m^3 of filter media in the BTF's) are shown in Table 1 below for the sampling dates shown. From the sampling data there is considerable fluctuation in the $cBOD_5$ loading rates which vary between 0.29 and 1.07 kg/m^3 media/day. The treatment level is high with an average $cBOD_5$ removal efficiency of 77% for the sampling dates shown.

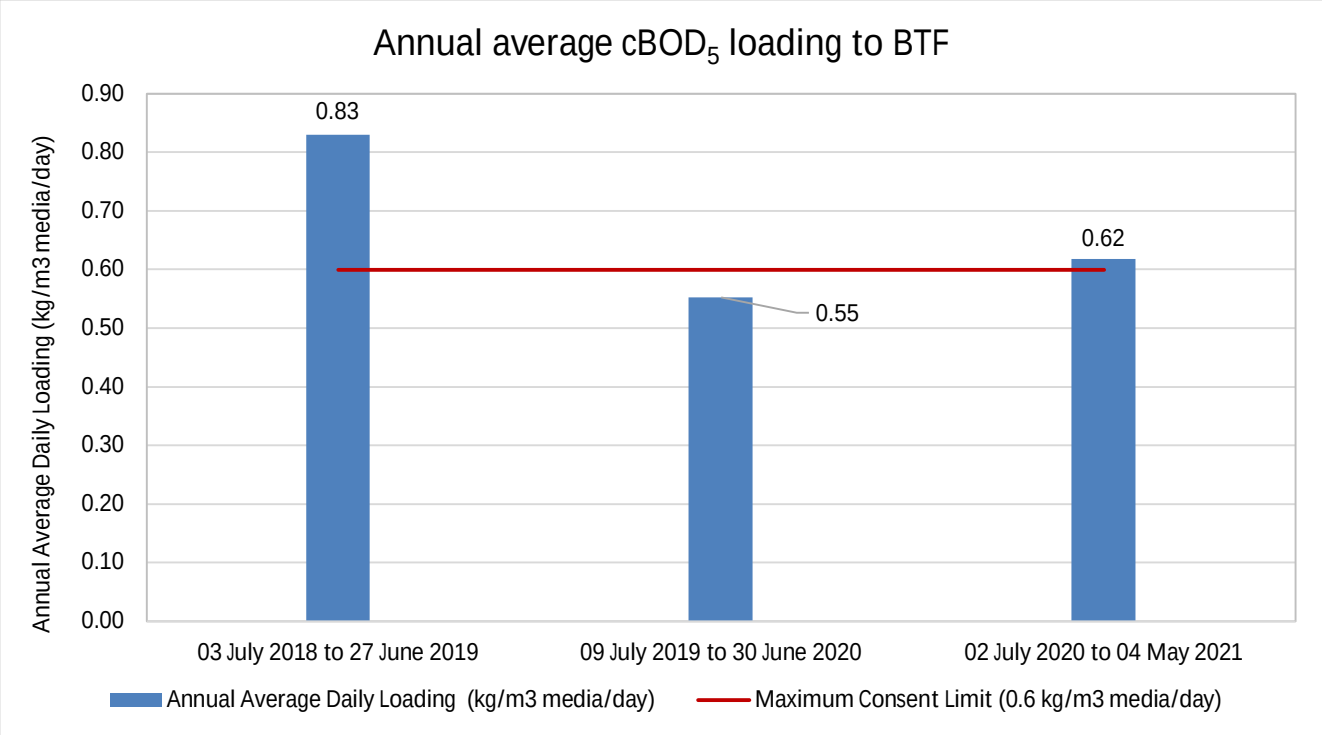

Figure 3 Annual average daily loading to BTF system based on bi-weekly data

Table 1 $cBOD_5$ loading and removal efficiency of biological trickling filter media

Date	cBOD in raw wastewater to BTF (g/m^3)	Daily Volume (m^3)	cBOD daily loading to BTF* (kg/m3 media/day)	cBOD in treated wastewater from BTF (g/m^3)	cBOD removal efficiency of BTF (%)
16-02-2018	461	19,739	1.05	50	89%
23-05-2018	455	20,546	1.07	165	64%
23-08-2018	250	19,832	0.57	39	84%
14-11-2018	210	18,932	0.46	25	88%
05-03-2019	310	18,696	0.67	62	80%
08-05-2019	450	17,994	0.93	64	86%
15-08-2019	260	18,696	0.56	53	80%
06-11-2019	187	19,704	0.42	57	70%
12-02-2020	290	17,314	0.58	49	83%
22-05-2020	300	17,324	0.60	50	83%
27-08-2020	191	19,388	0.43	78	59%
24-11-2020	105	23,746	0.29	48	54%
23-02-2021	290	17,612	0.59	61	79%

*cBOD loading is based on 8,700 m^3 total media volume

ii. NCC confirm that the WWTP has 1mm aperture milliscreening on the inlet receiving domestic and industrial wastewater. Grit removal is via a vortex grit trap classifiers. It is noted that the treatment system design was peer reviewed and approved HBRC prior to construction, thus satisfying the requirement for design by an independent chartered engineer or similarly qualified person specialising in wastewater treatment plant and paid for by the consent holder.

iii. As noted in Section 3 which describes the current configuration of the Napier WWTP, the treated effluent is passed through a Rakahore channel (an open channel filled with rocks) prior to discharge, as requested, approved, and blessed by tangata whenua. It was noted by NCC that this has previously been submitted to HBRC for review.

5.6.4 Compliance

The treatment process with respect to BTF complies with the RCCP requirements. However there has been a non-compliance in the $cBOD_5$ loading rate, with annual average loading rates to the BTF filter media consistently exceeding the RCCP limit of 0.6 kg/m^3 media/day. It is noted that the industrial flows from Pandora continue to contribute to elevated levels of BOD loading to the biological treatment process. Notwithstanding the higher loading rates to the BTF plant, the $cBOD_5$ removal efficiency of the BTF system is high as shown in Table 1, indicating that the biological treatment process is performing adequately. NCC have assessed options to reinstate the Pandora Industrial line to receive this wastewater stream separately to reduce organic loads to the BTF as part of the wastewater masterplan in July 2020.

Further, NCC will be undertaking a review of the tradewaste bylaw in 2021-2022 reporting period in order to provide another tool to support reduced loadings at the WWTP. Funding has been allocated over a three-year period to reinstate the Pandora Industrial Pipeline and to investigate treatment options for Pandora tradewaste. Masterplanning for the WWTP is also being undertaken to look at the present level of treatment, account for potential future treatment levels in conjunction with projected population growth, sea level rise and climate change over the next thirty years (NCC pers. comm.).

The treatment process complies with the requirements in part (ii) of Condition 6

The treatment process complies with the requirements in part (iii) of Condition 6

5.7 Condition 7 – Concentrations in Combined Wastewater

5.7.1 Condition

RCCP conditions for this condition have been paraphrased below. The full RCCP conditions can be found in Appendix A of this report.

Maximum concentrations and loads in the final combined wastewater shall not exceed:

Table 2 Analyte consent limits for concentrations and loads

Analyte	Maximum Concentration (g/m^3)	Maximum Load (kg/day)
Total Ammonia-N	91	2912
Cadmium (Cd)	0.55	17.6
Chrome (Cr III)	2.74	87.7

Analyte	Maximum Concentration (g/m^3)	Maximum Load (kg/day)
Chrome Hexavalent (Cr VI)	0.44	14.1
Copper (Cu)	0.13	4.16
Lead (Pb)	0.44	14.1
Mercury (Hg)	0.04	1.3
Nickel (Ni)	7	224
Zinc (Zn)	1.5	48

*Loads based on average annual flow – 32,000m^3/day

Any single exceedance will result in non-compliance.

5.7.2 Source of Data

Data has been provided by Napier City Council in an excel spreadsheet titled '2012 Consent Results' which shows chemical analysis data for combined wastewater samples taken at final wetwell prior to being pumped to the Awatoto foreshore and then gravity discharge via outfall. Data has been analysed for the period between 13 February 2018 to 01 March 2021.

5.7.3 Analysis of Data

Maximum concentration and loads recorded during the monitoring period are shown in Table 3

Table 3 Combined Wastewater analytes concentration and loads (Monitored vs Limits)

Analyte	Concentrations (g/m^3)		Loads (kg/day)	
	Monitored Max	HBRC Condition Limit	Monitored Max	HBRC Condition Limit
Total Ammonia-N	95	91	2,067	2,912
Cadmium (Cd)	0.0004	0.55	0.009	17.6
Chrome (Cr III)	0.200	2.74	4.544	87.7
Chrome Hexavalent (Cr VI)	0.0500	0.44	1.189	14.1
Copper (Cu)	0.0350	0.13	0.833	4.16
Lead (Pb)	0.0089	0.44	0.270	14.1
Mercury (Hg)	0.0004	0.04	0.010	1.3
Nickel (Ni)	0.0260	7	0.646	224
Zinc (Zn)	6.3	1.5	142	48

All analytes (except for Total Ammonia-N and Zinc) are below the maximum concentration limits of the RCCP and comply with the condition. Zinc load also exceeds the RCCP limit.

There is a considerable fluctuation in the recorded concentrations of Total Ammonia-N, which fluctuated between 8 and 95 g/m^3 during the monitoring period, however the majority of the concentration values during the monitoring period are below the RCCP limit. The maximum recorded concentration of 95 g/m^3 which is above the limit of 91 g/m^3 was recorded on two occurrences - on 15 February 2020 and on 26 February 2021. Given the fluctuation evident in the data, and influence of other variables such as weather conditions not assessed in this analysis, no comment has been made on any reliable trend for total Ammonia-N levels observed in the combined wastewater discharged, both exceedances to the RCCP limit occurred in the month of February in the subsequent years.

Zinc concentrations and loads exceeded the limit conditions on a few occasions in March 2019, August 2020, and November 2020, however significant spikes were recorded on a couple of occasions in August 2019, reaching a peak concentration of 6.3 g/m^3 (compared to a concentration limit value of 1.5 g/m^3) and a calculated load of 142 kg/day (compared to a load limit of 48 kg/day) on 16 August 2019.

The monitored concentrations (g/m^3) and loads (kg/day) recorded during the monitoring period, along with the relevant HBRC limits, are plotted in the figures shown on the following pages, for each analyte.

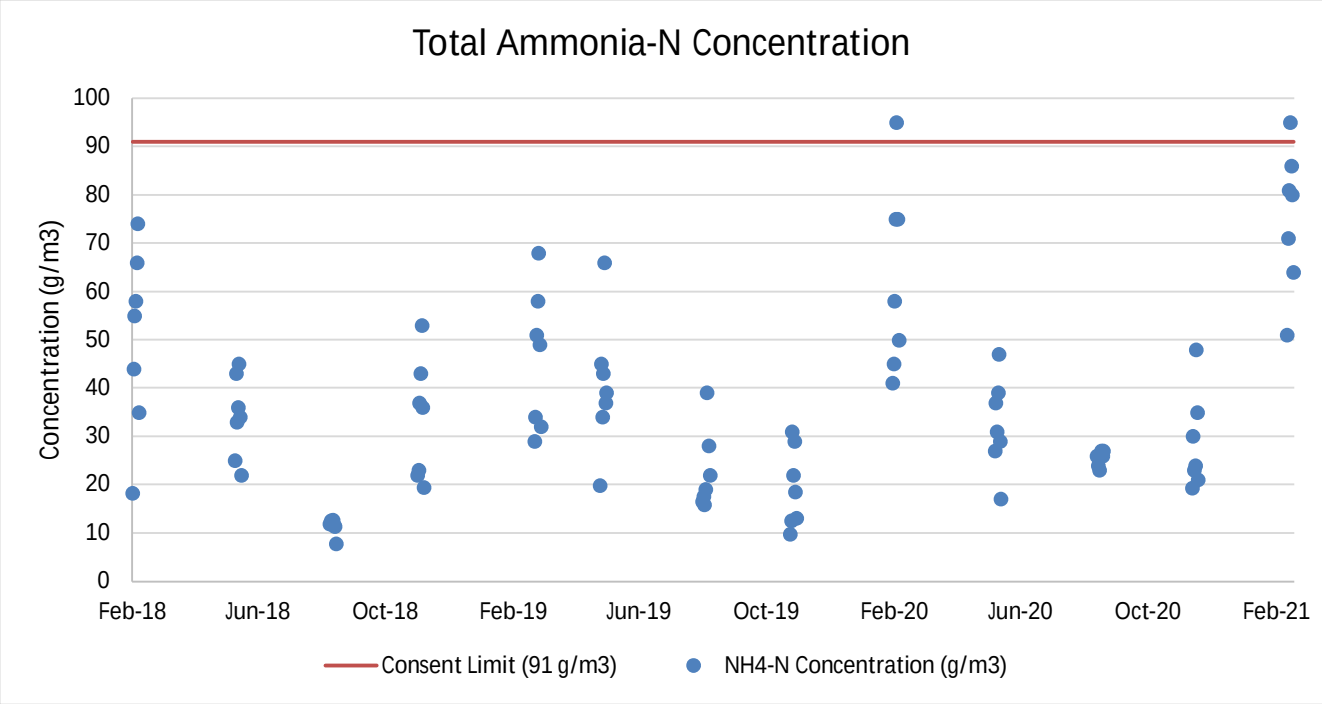

Figure 4 Graph of NH_4-N concentrations in combined wastewater

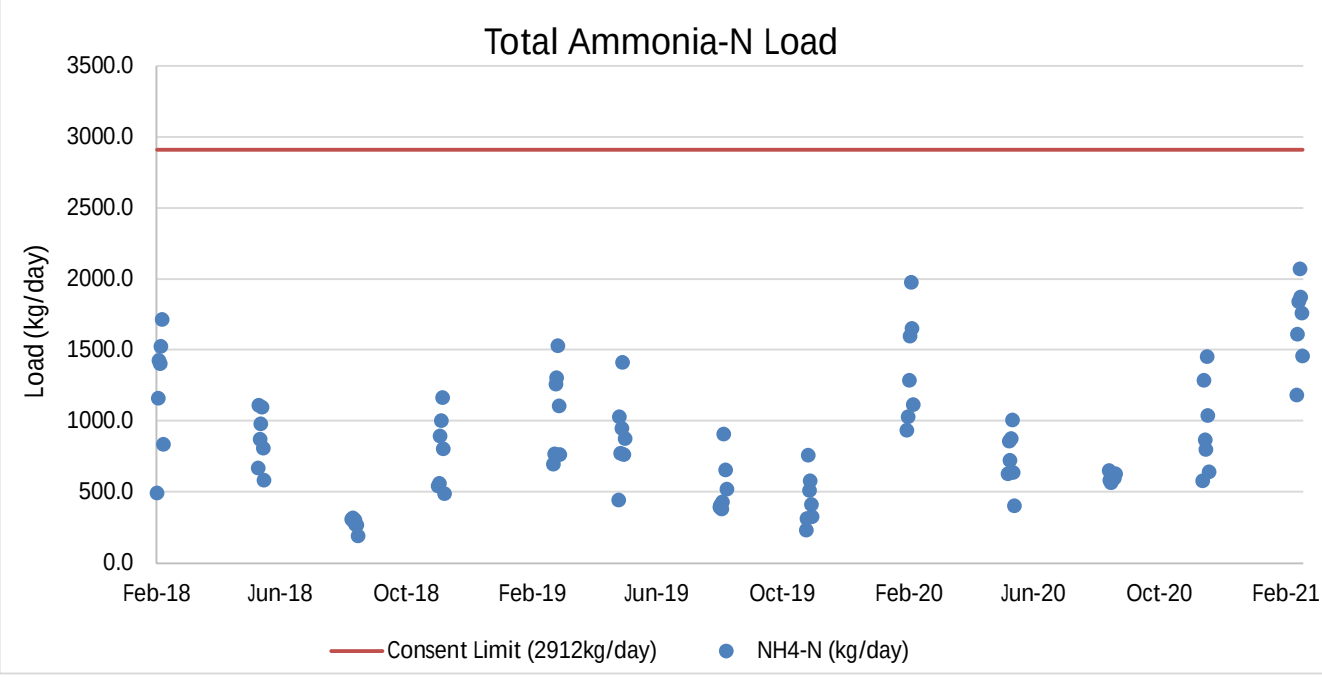

Figure 5 Graph pf NH4- loads in combined wastewater

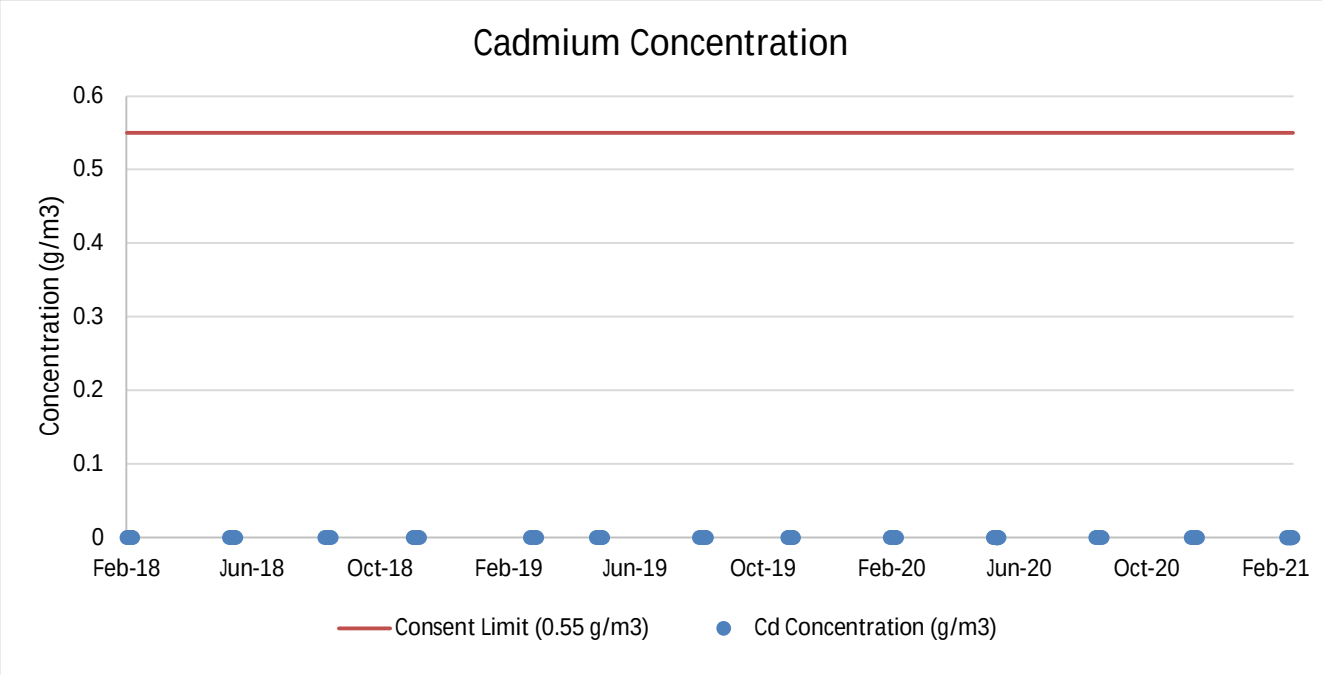

Figure 6 Graph of Cadmium concentrations in combined wastewater

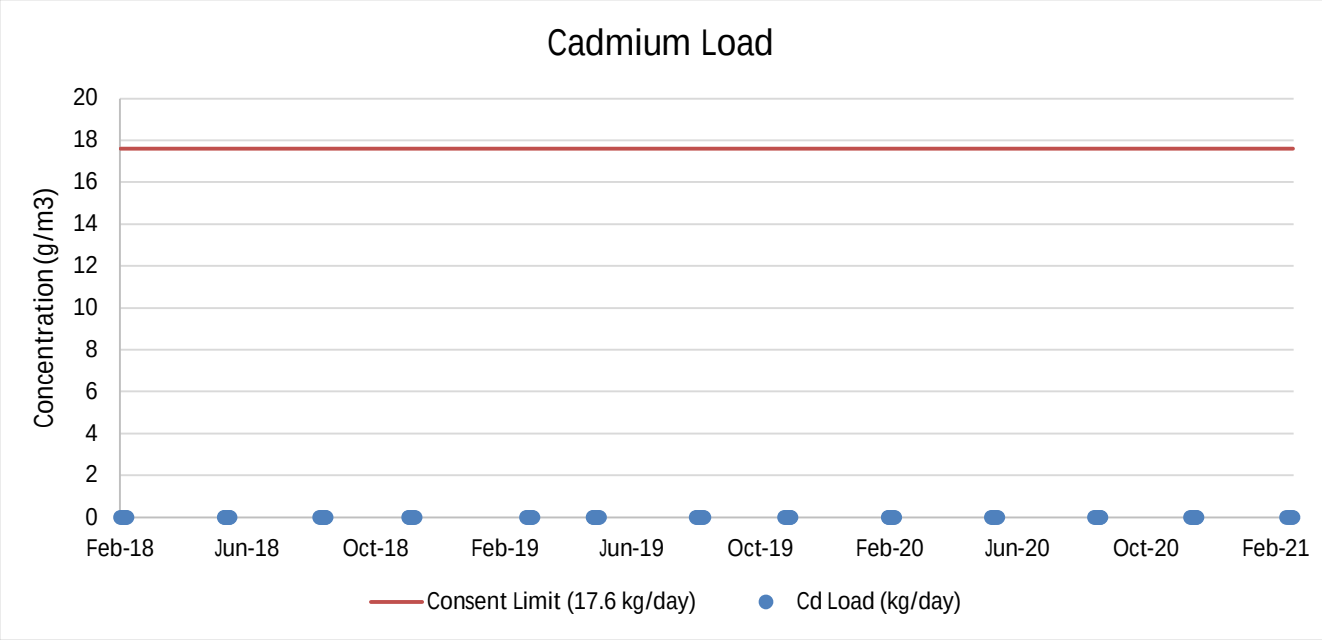

Figure 7 Graph of Cadmium loads in combined wastewater

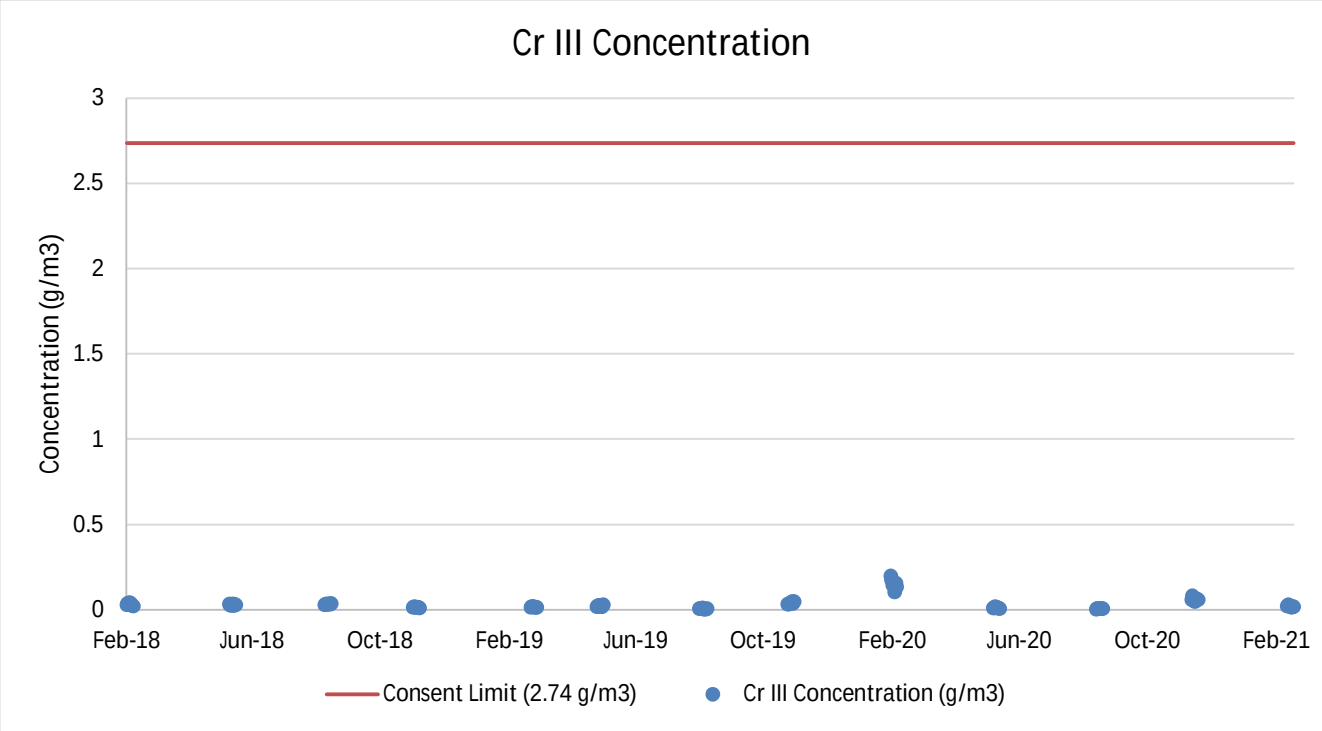

Figure 8 Graph of Chrome III concentrations in combined wastewater

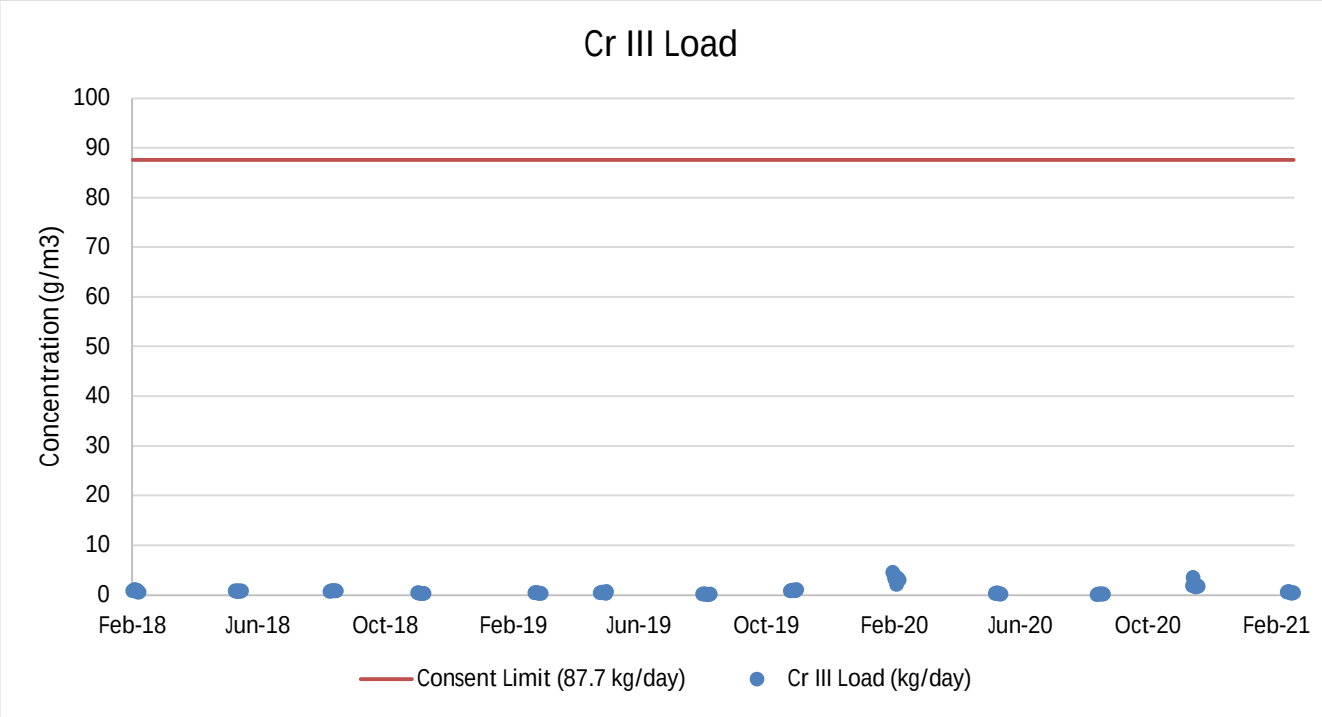

Figure 9 Graph of Chrome III loads in combined wastewater

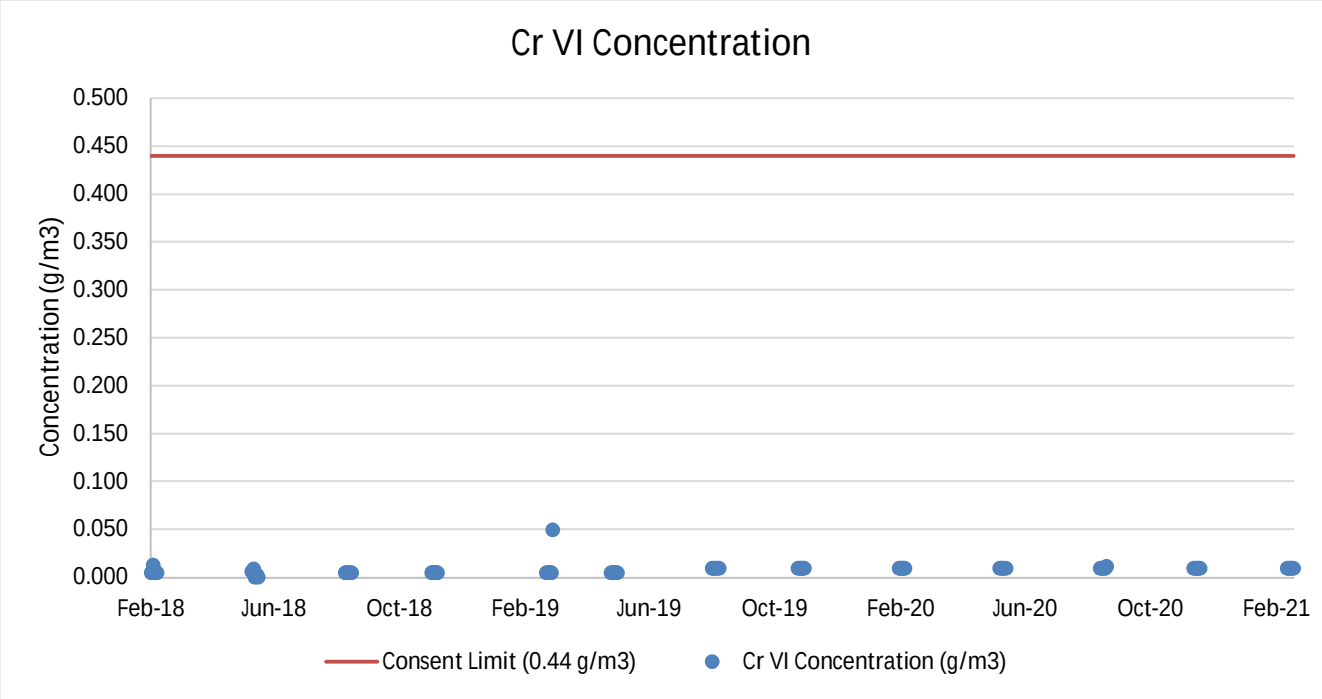

Figure 10 Graph of Chrome VI concentrations in combined wastewater

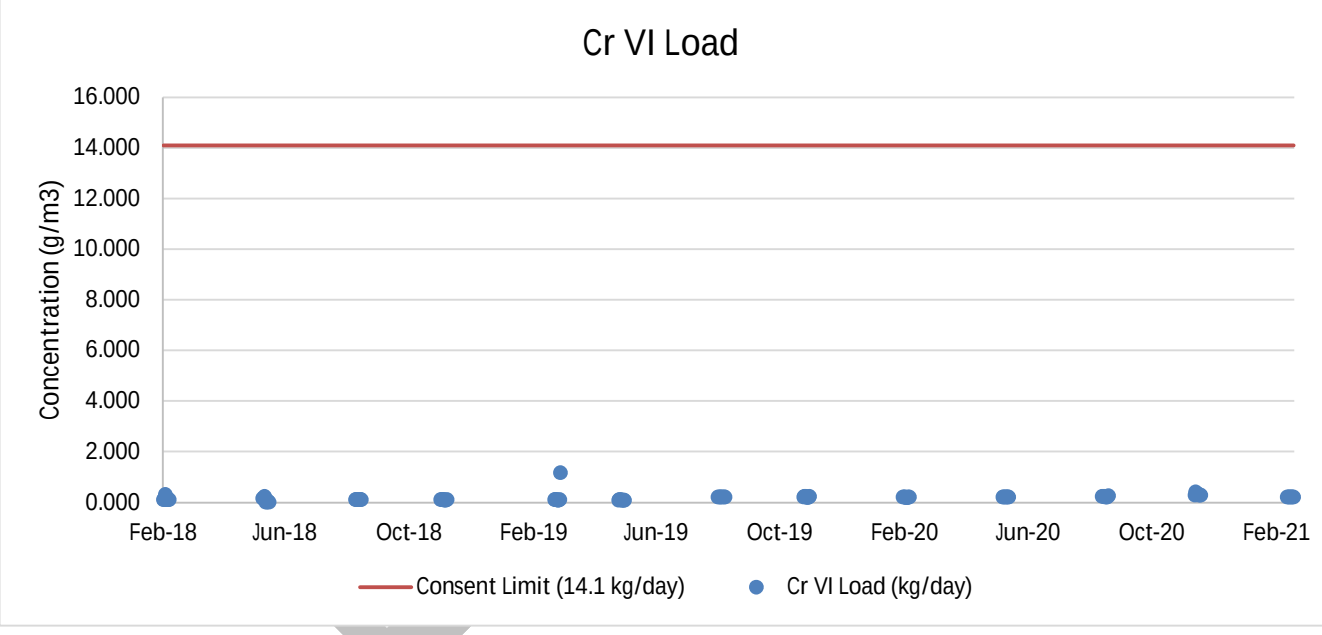

Figure 11 Graph of Chrome VI loads in combined wastewater

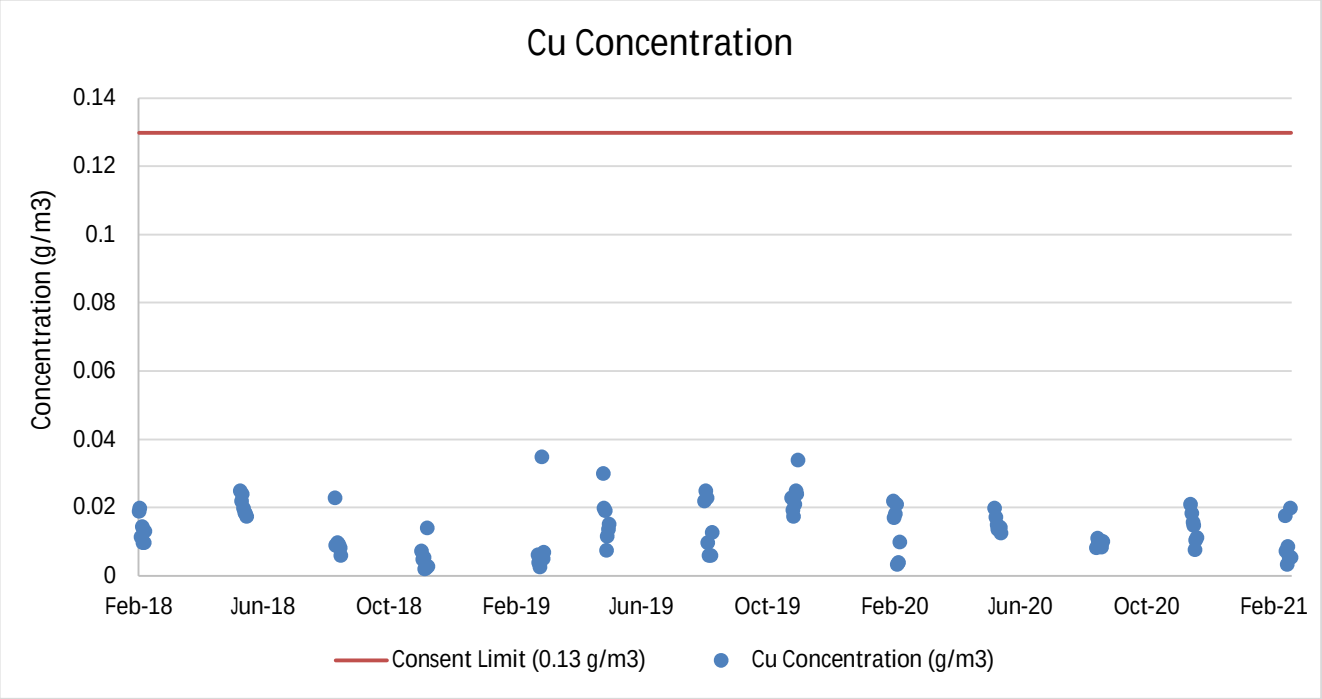

Figure 12 Graph of Copper concentrations in combined wastewater

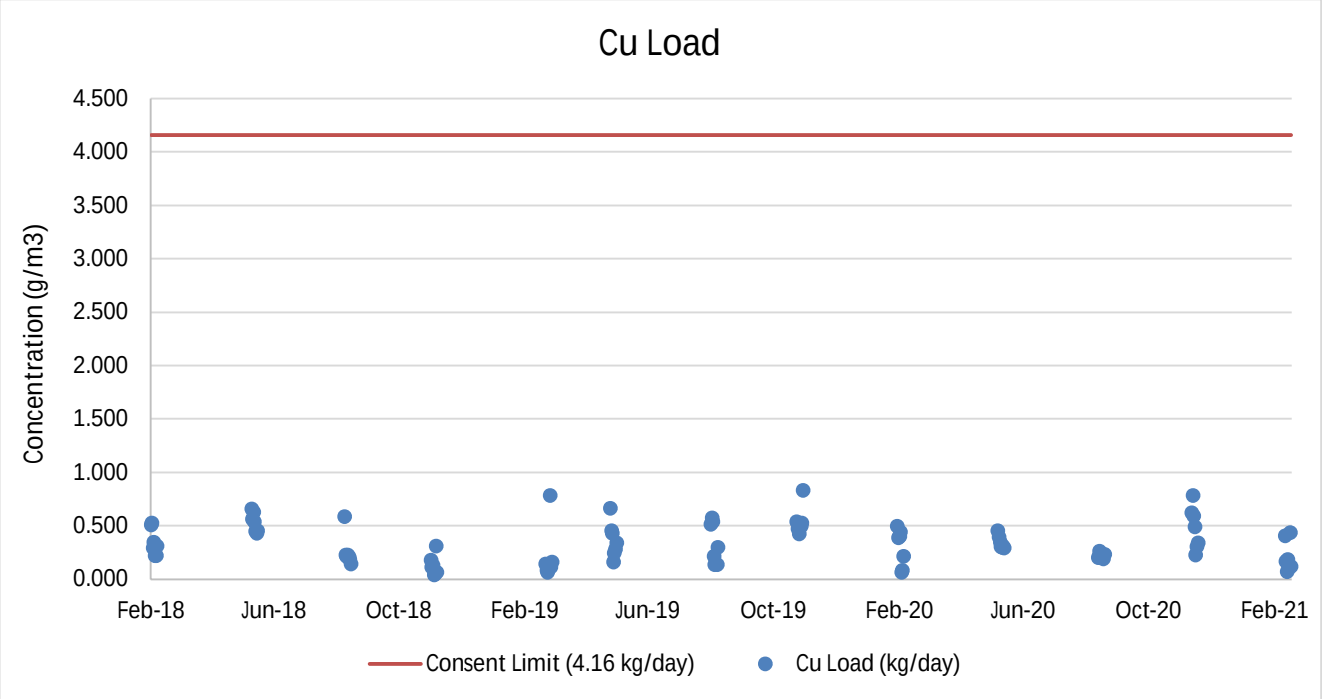

Figure 13 Graph of Copper loads in combined wastewater

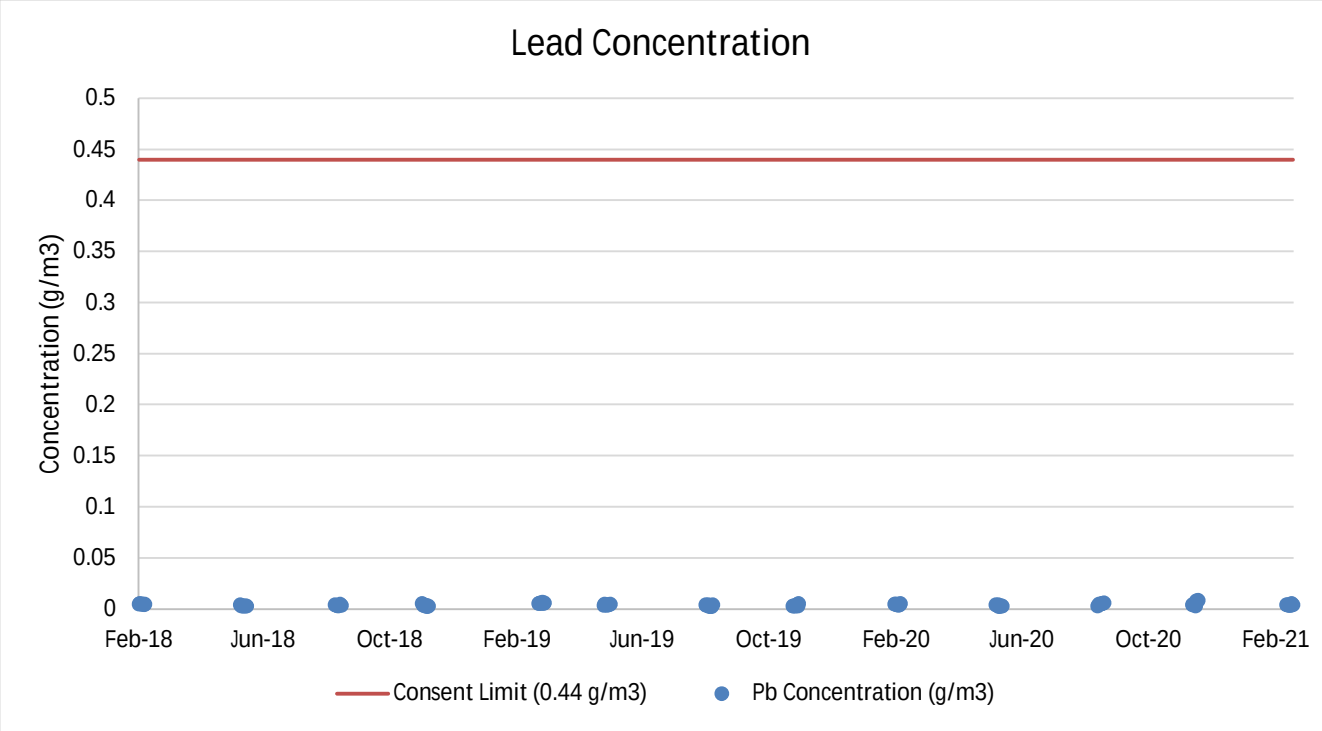

Figure 14 Graph of Lead concentrations in combined wastewater

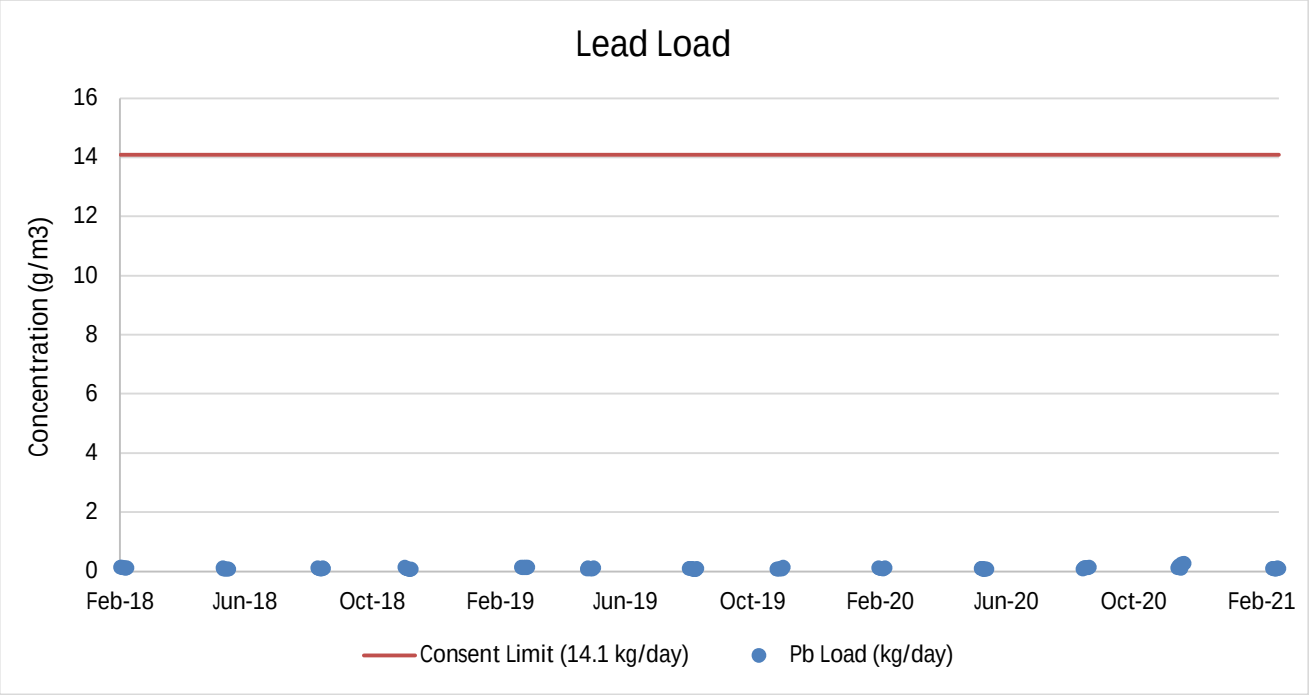

Figure 15 Graph of Lead loads in combined wastewater

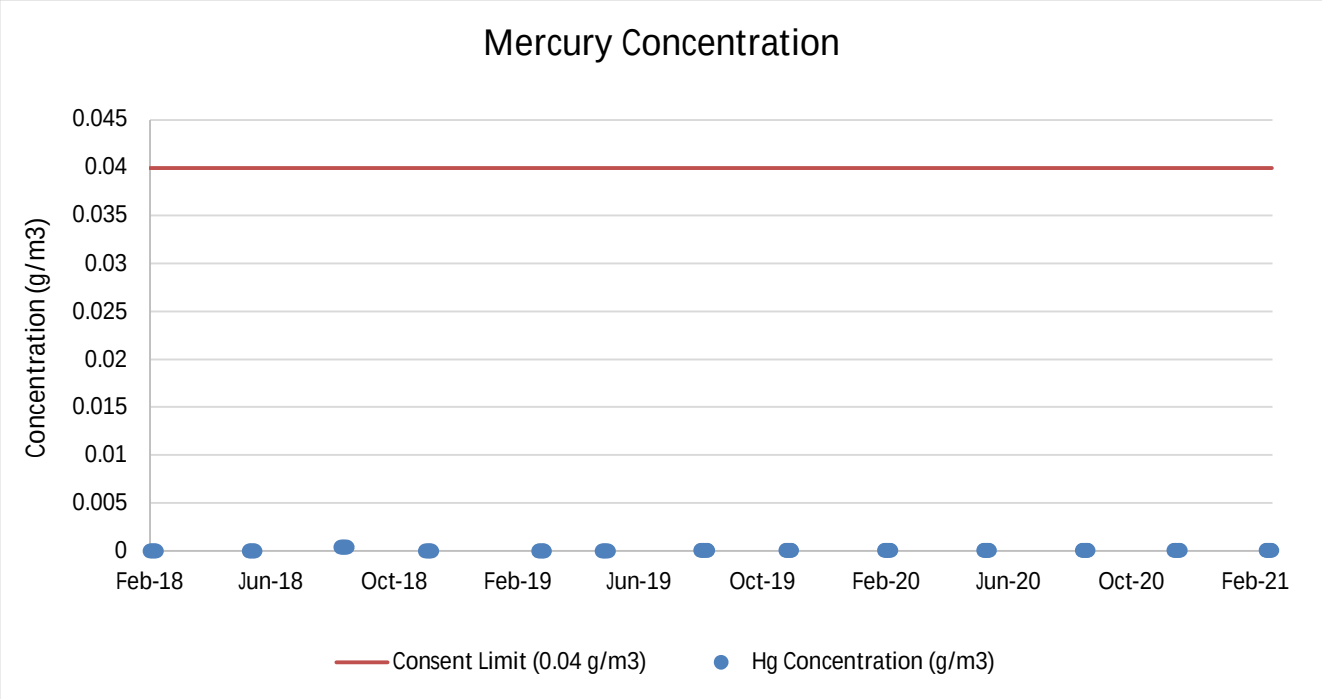

Figure 16 Graph of Mercury concentrations in combined wastewater

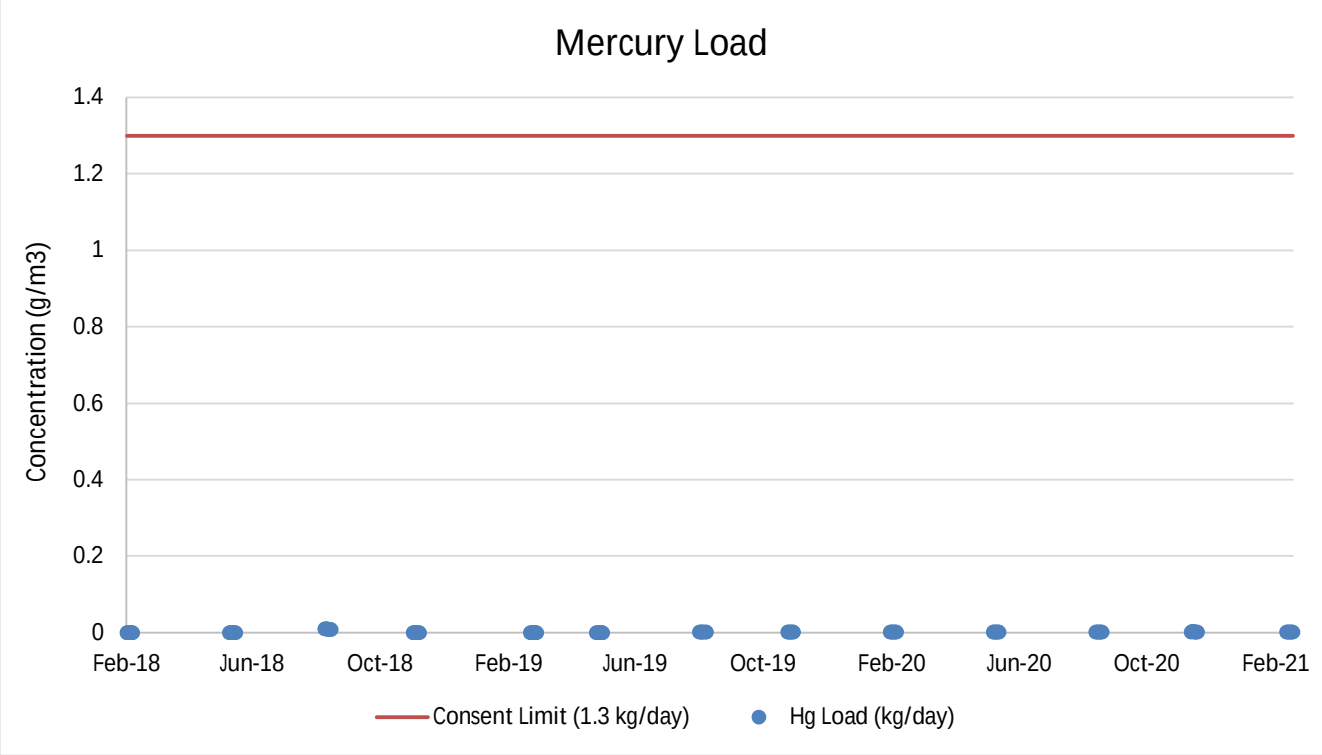

Figure 17 Graph of Mercury Loads in combined wastewater

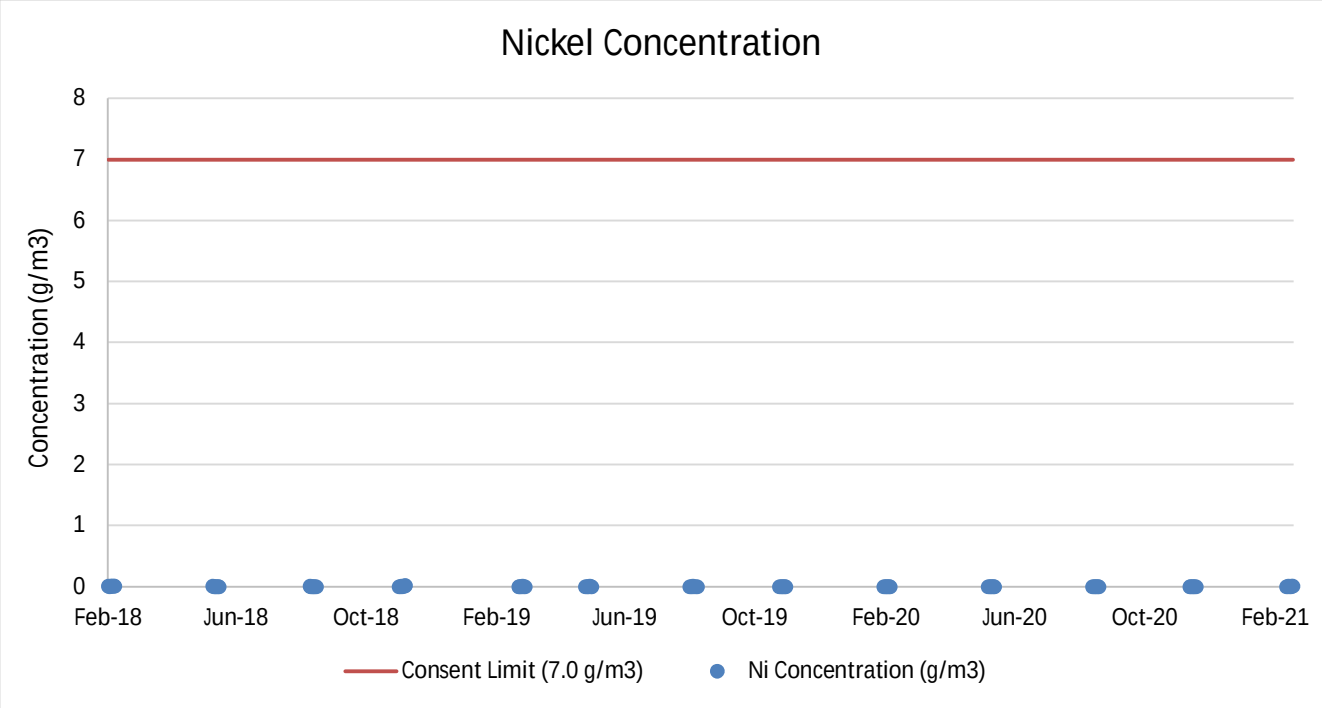

Figure 18 Graph of Nickel concentrations in combined wastewater

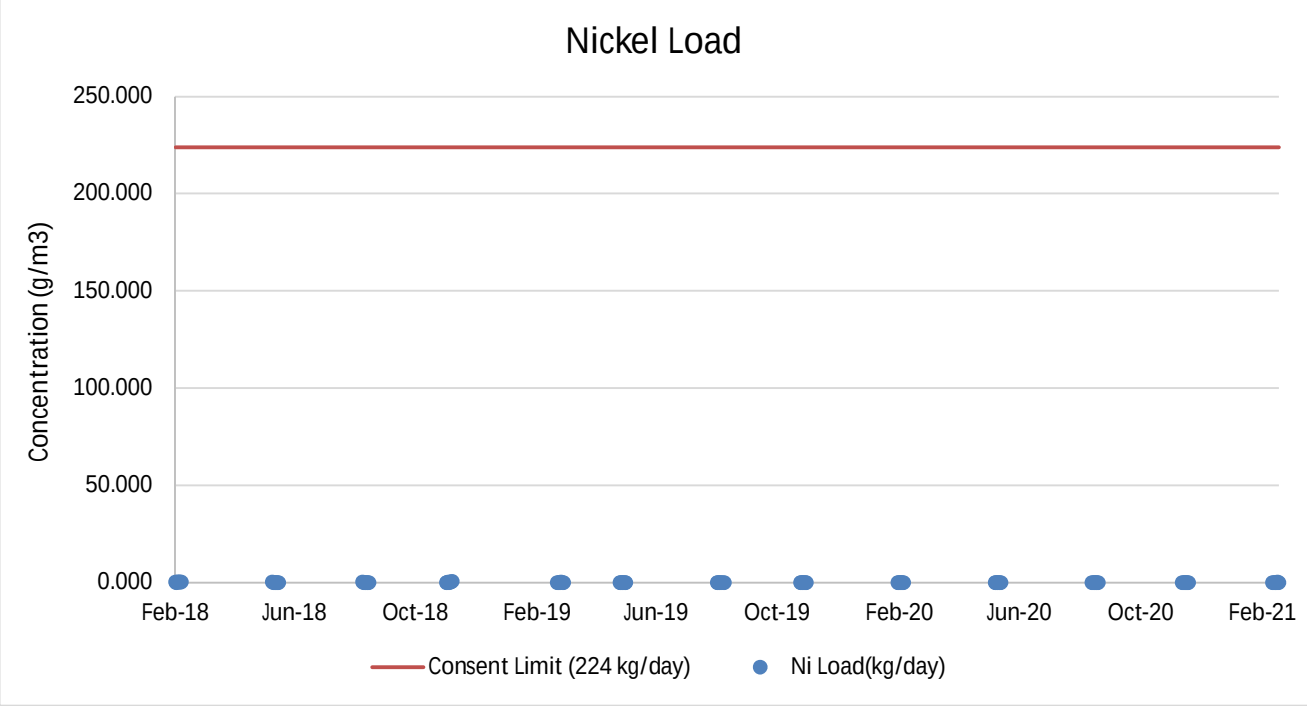

Figure 19 Graph of Nickel loads in combined wastewater

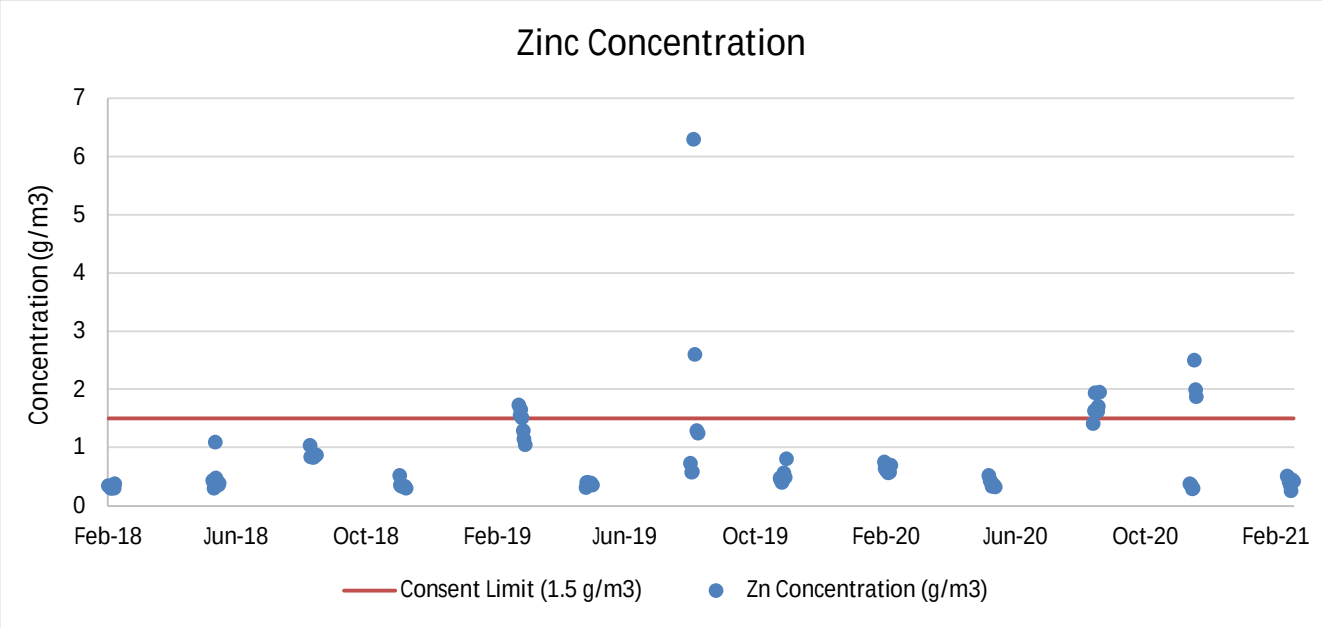

Figure 20 Graph of Zinc concentrations in combined wastewater

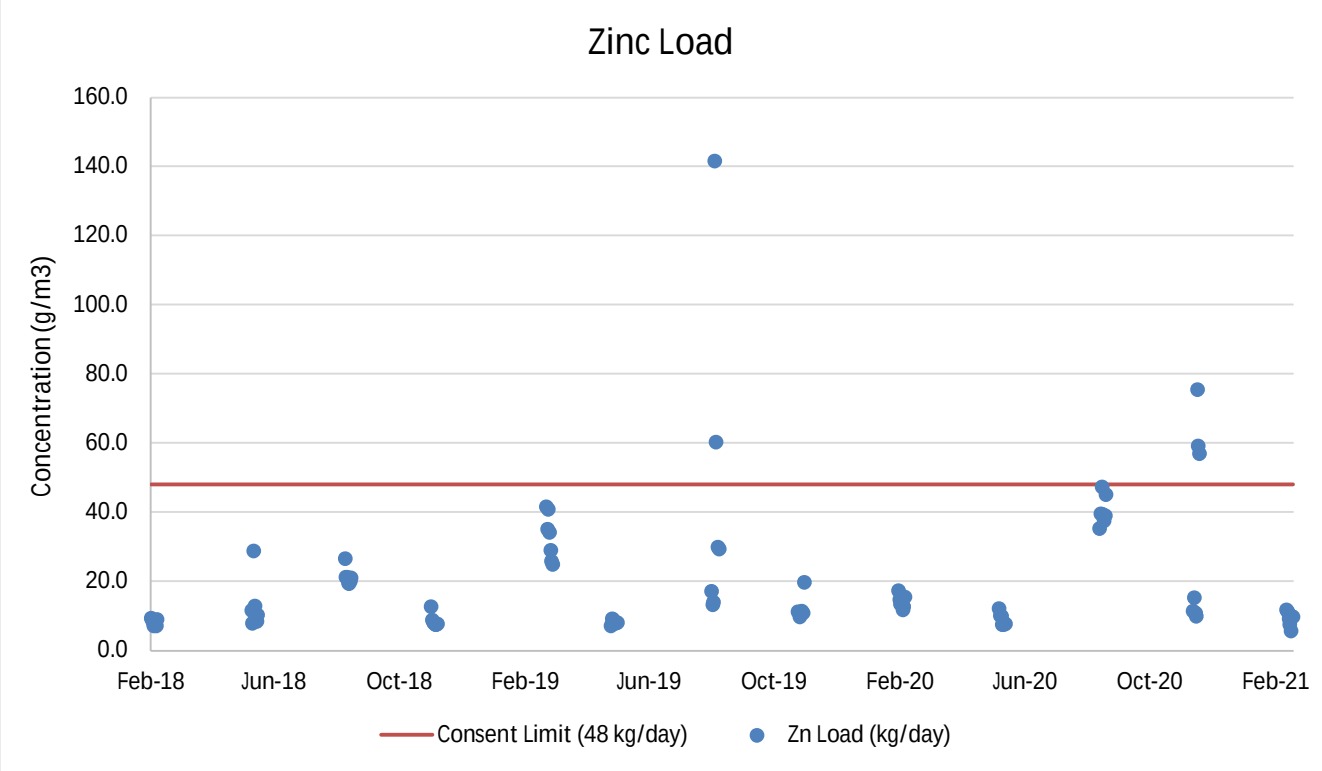

Figure 21 Graph of Zinc loads in combined wastewater

5.7.4 Compliance

Concentrations and loads for all analytes (except total NH_4-N and Zinc) during the monitoring period were below the limit criteria set in the RCCP.

The exceedances in total Ammonia-N have not been attributed to a single source. Following the exceedance of total Ammonia-N limit recorded on 15 February 2020, NCC has increased engagement with industrial trade-waste customers in the Pandora Industrial area who use ammonia forming agents in their processes. NCC is also investigating the potential high ammonia-N levels occurring on Saturdays – a trend observed over the course of 2020.

The elevated zinc concentrations and loads recorded (as shown in Figure 20 and Figure 21) have not been attributed to a single source. NCC noted that according to testing completed to date, zinc levels in all industrial waste streams are low. Following the spike in Zinc concentration recorded on 16 August 2019, follow up samples were collected once the August 2019 results were received. HBRC were informed of these results at the time including the actions proposed by NCC to address the high zinc levels as per the RCCP condition requirements. Additional investigation has found remedial work at an industrial site has been undertaken since the high zinc result was found, however there is no evidence that this was the point source of high zinc concentrations. NCC will continue to monitor zinc concentrations to assess any ongoing issues with this analyte.

5.8 Condition 8 – Analytes in Combined Wastewater

5.8.1 Condition

RCCP conditions for this condition have been paraphrased below. The full RCCP conditions can be found in Appendix A of this report.

In the final combined wastewater the analytes below (Table 4) do not exceed the following trigger values:

Table 4 Analyte average and maximum loads consent limits

Analyte	Average Load* (kg/day)*	Maximum Load** (kg/day)
cBOD	18,000	22,400
TSS	18,000	22,400
TFO&G	7,000	8,800
pH	N/A	6.5-8.5

* The average load should be based on a 12-month rolling mean

**Loads based on average annual flow of 32,000m³/day

5.8.2 Source of Data

Data has been provided by Napier City Council in an excel spreadsheet titled '2012 Consent Results' which shows quarterly loading data for combined wastewater prior to discharge. Data has been analysed for the period between 13 February 2018 to 01 March 2021.

5.8.3 Analysis of Data

Biological Oxygen Demand – cBOD

The daily $cBOD_5$ loads (kg/day) and the 12 month rolling average $cBOD_5$ of the combined wastewater discharged are shown on Figure 22. The monitoring data indicates that the average $cBOD_5$ loads of effluent discharged (based on a 12 month rolling average) were below the RCCP limits as shown in Figure 22.

The maximum daily loading rate in the final effluent exceeded the $cBOD_5$ consent limit on a few occasions during the monitoring period, particularly in February 2020, August 2020 and November 2020.

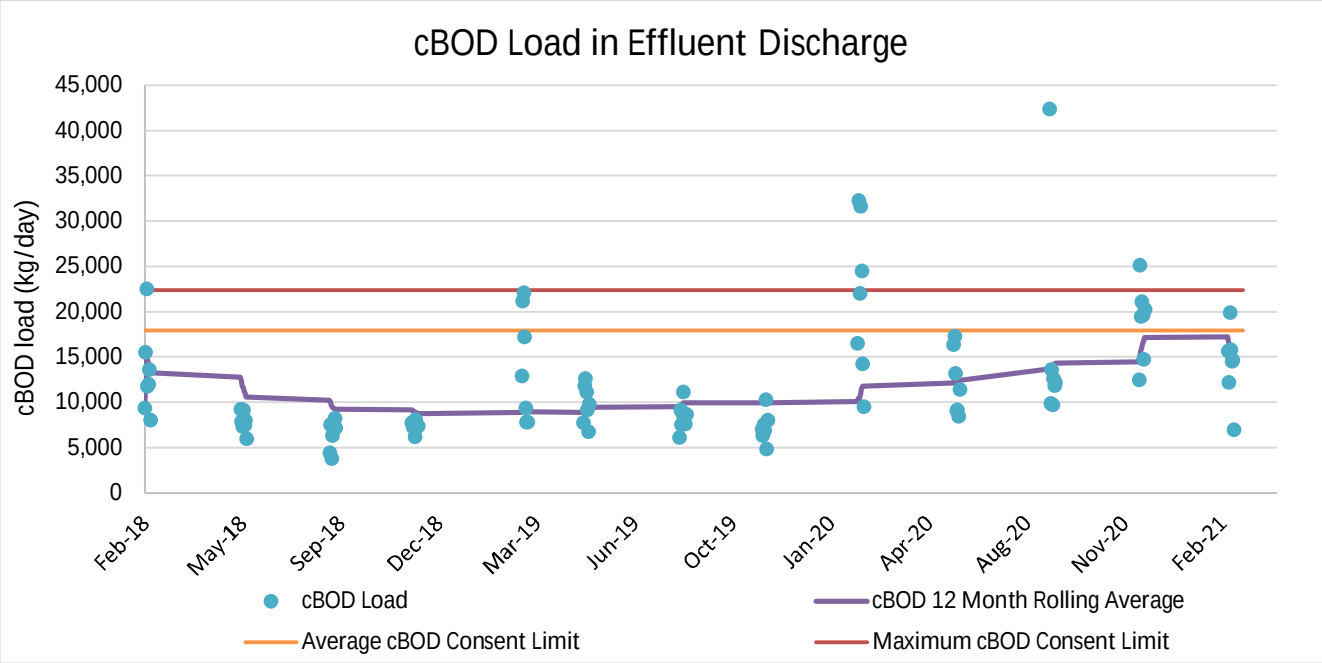

Figure 22 $cBOD_5$ daily loads and 12 month rolling average vs Limits

Total Suspended Solids (TSS)

The daily TSS loads (kg/day) and 12 monthly rolling average TSS loads are shown on Figure 23.

From the monitoring data (and as seen on Figure 23), the average TSS load (based on a 12 month rolling average) has exceeded the average TSS consent limit in 2018 and in 2020.

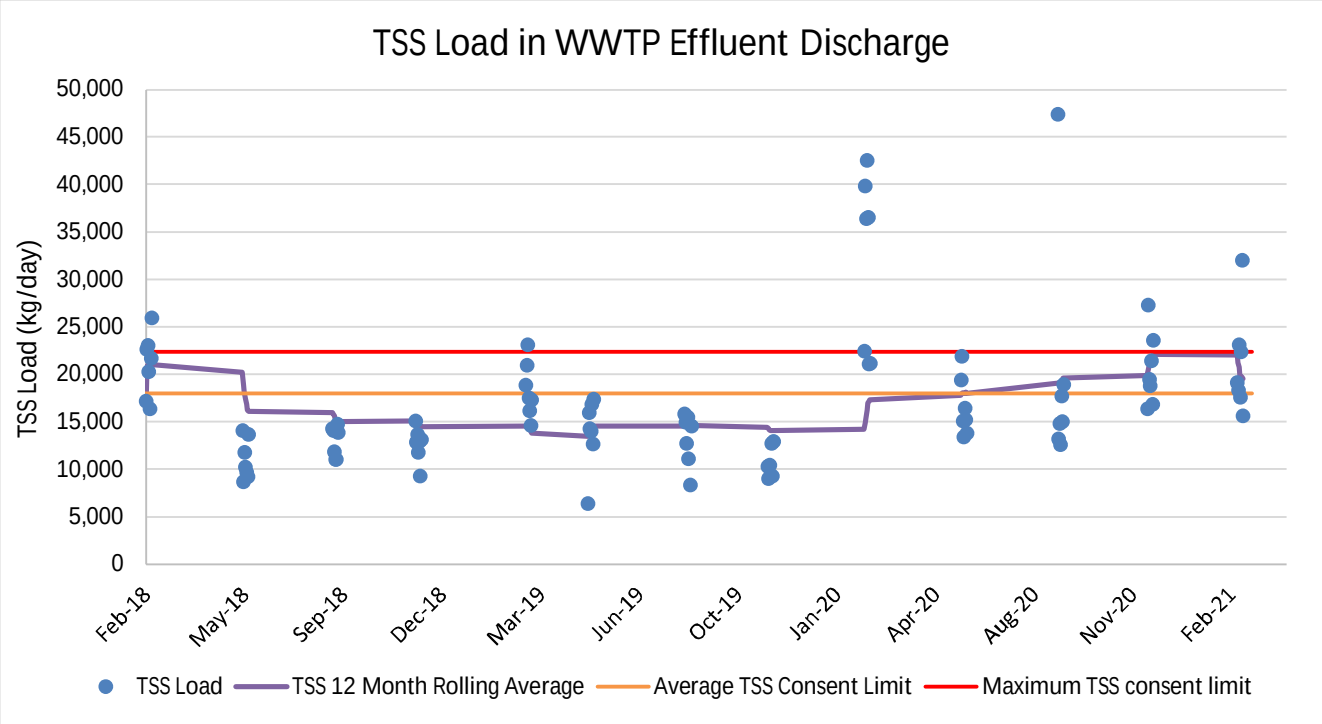

Figure 23 TSS daily loads and 12 month rolling average vs Limits

Total Fats Oils & Grease (TFO&G)

The maximum daily monitored TFO&G load in the treated wastewater exceeded the limit in March 2019, February 2020, August 2020, and November 2020. The average loading limits for the treated wastewater complied with the limits except in November 2020 whereby maximum daily loads also exceeded the limit. A similar trend was observed during this period for the other analytes.

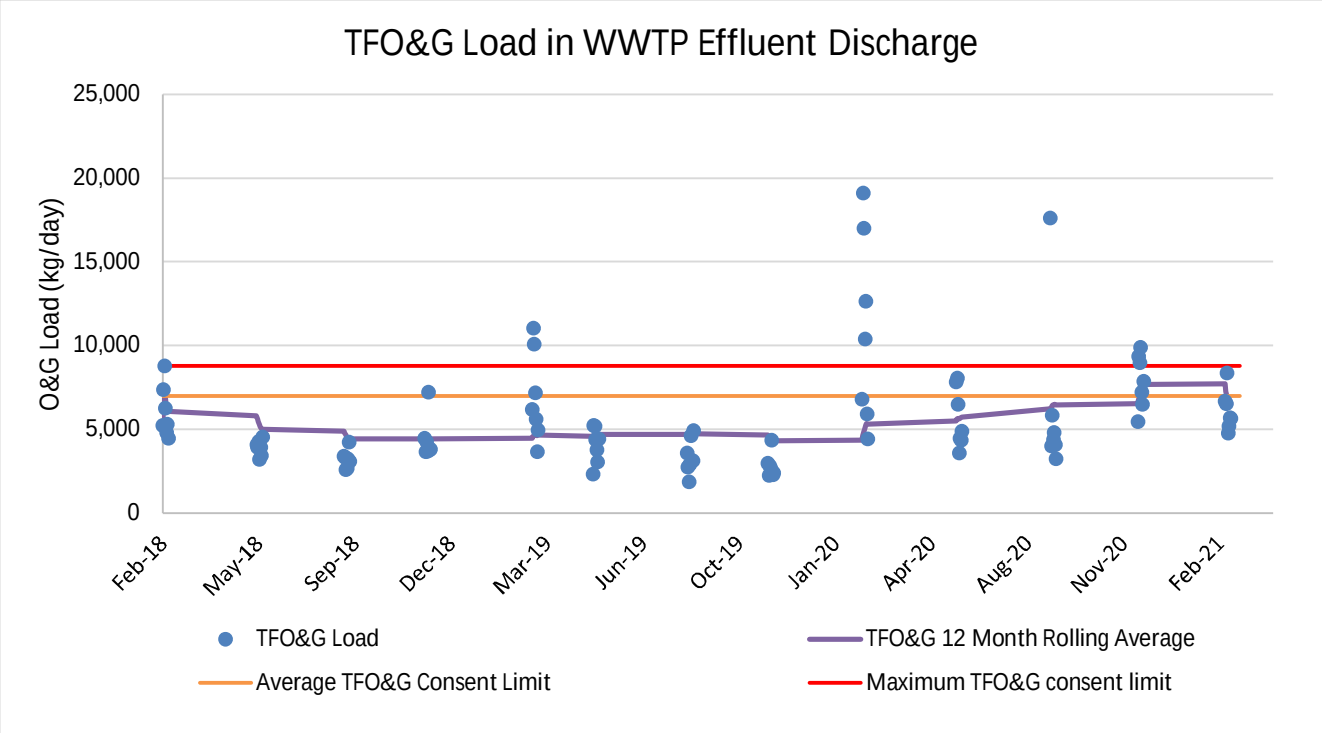

Figure 24 TFO&G daily loads and 12 month rolling average vs Limits

pH

pH has stayed within the limits, ranging between 7.0 and 7.6 over the monitoring period.

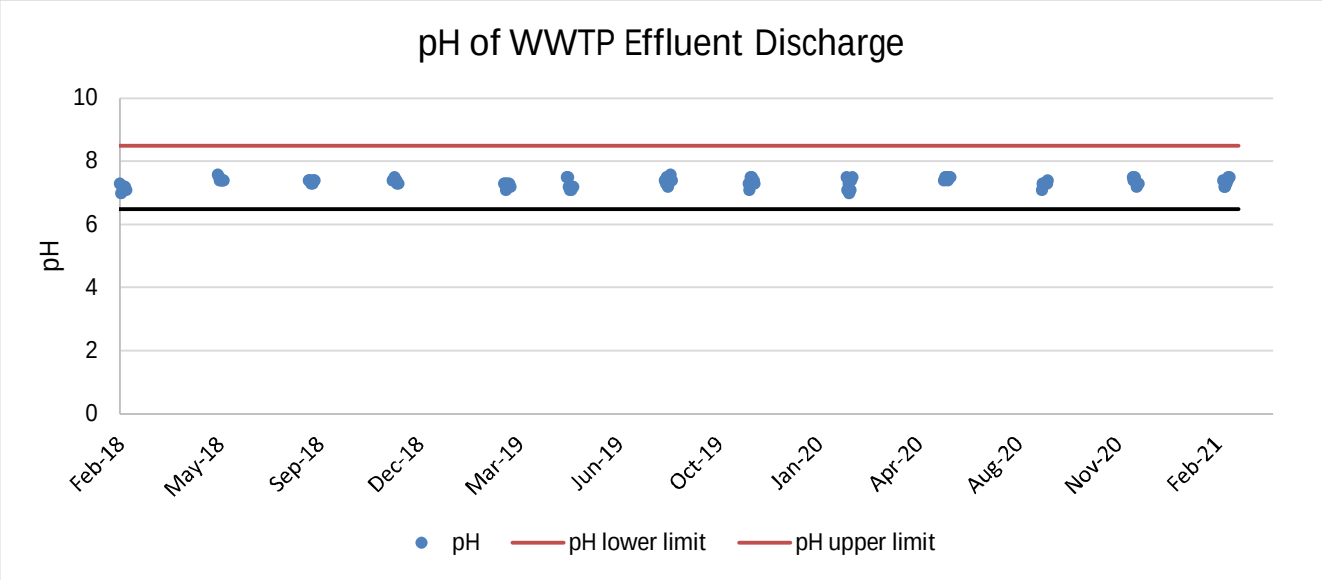

Figure 25 Quarterly pH values vs limits

5.8.4 Compliance

$cBOD_5$: Average $cBOD_5$ loads of effluent discharged (based on a 12 month rolling average) complied with the limit, however the maximum daily loading rate in the final effluent exceeded the $cBOD_5$ consent limit on a few occasions.

TSS: Both the average TSS loading rate (based on a 12 month rolling average) and maximum TSS loading rate exceeded the consent limits.

TFO&G: The maximum daily monitored TFO&G load exceeded the limit on a few occasions. The average TFO&G load (based on a 12 month rolling average) exceeded the consent limit in November 2020.

pH: 100% Compliance

It is noted that high TSS has been attributed to rainfall events while combined high $cBOD_5$ and TSS were recorded on the 9th of January 2020 from the Awatoto industrial inflow. The Awatoto industrial line had discharge at concentrations higher than previously recorded for January and February which resulted in the maximum loadings being exceeded. All exceedances have been reported to Council as required. Exceedances have largely been attributed to operations discharging into the Awatoto industrial line.

5.9 Condition 9 – Discharge Screen Size

5.9.1 Condition

Part B of this condition has not been included here as it is no longer applicable

A) Except for B) below, at all times from the commencement date of this consent, all wastewater discharged shall pass through a screen having a maximum aperture of 1 mm discharged.

5.9.2 Source of Data

Information on the current configuration of the Napier WWPT including details of discharge screen size has been provided in the 2018/2019 and 2019/2020 annual and compliance reports.

5.9.1 Analysis of Data

It is noted that all wastewater passes through a milliscreen with 1mm aperture prior to discharge.

5.9.2 Compliance

Complies.

Based on the process description provided.

5.10 Conditions 10 – 12

Conditions 10 to 12 have been addressed as part of other conditions presented in this performance report or are otherwise not applicable.

5.11 Condition 13 – Changes in Seawater Around the Outfall

5.11.1 Condition

RCCP conditions for this condition have been paraphrased below. The full RCCP conditions can be found in Appendix A of this report.

A. The discharge of wastewater shall not cause any of the following effects beyond a distance of 300m from the outfall diffuser:

i) The production of any conspicuous suspended materials; or

ii) Any conspicuous change in colour or visual clarity; or

iii) The production of any conspicuous oil or grease films, scums or foams, or floatable materials; or

iv) Any emission of objectionable odour; or

v) Any significant effect on aquatic life; or

vi) A change in the natural temperature of the receiving water of more than 3 degrees Celsius; or

vii) The dissolved oxygen to be less than 80% of the saturation concentration; or

viii) Undesirable biological growths.

B. During the single milliscreen bypass period of up to 12 weeks referred to in Condition 9 B the effects described in clauses i), ii), and iii) above may occur at a distance beyond 300m but shall be mitigated by actions detailed in the Milliscreen Bypass Management Plan required by Condition 32.

C. The flushing cycle of the biological trickling filter in the first year of operation shall occur daily between the hours of 3 am and 5 am. On four occasions during the first year of operation and yearly thereafter the flushing process shall occur later so that the discharge reaches the end of the outfall pipe during normal working hours (8 am to 5 pm) ("the monitoring discharge"). Mr W. Church is to be advised of the intended date of the monitoring discharge at least 48 hours prior to the monitoring discharge occurring. In the event that, after the first year, the optimal time of discharge is considered to be other than 3 am to 5 am, this condition may be reviewed with Mr Church and if agreed, reviewed in accordance with section 128 and/or 129 of the Resource Management Act 1991.

5.11.2 Source of Data

Data has been provided by Napier City Council in an excel spreadsheet titled '2012 Consent Results' which includes monitoring data of Dissolved Oxygen (DO) and Temperature. The data is for the water quality of seawater, measured in Hawke Bay, at a distance of 300m from the outfall diffuser in 5 different directions. Dissolved oxygen is also measured at distances of 250m, 300m and 500m from the outfall diffuser in 5 different directions. The Dissolved Oxygen and Temperature at the five monitoring points are compared to those at a 'Control Point' which is unlikely to be affected by the outfall.

5.11.3 Analysis of Data

Condition 13 A

Dissolved Oxygen (DO)

Dissolved oxygen (DO) saturation levels were measured in seawater at five points equidistant on a circle centred on the diffuser and with a radius of 300m. These are numbered 1/300 to 5/300 in Figure 26 below. Dissolved oxygen was below the 80% saturation level during August 2018, with a small variation (maximum 8%) among all sites including the reference site. November 2018 DO saturation levels for all five sites ranged between 104% to 122%. Overall, DO saturation levels were above the 80% saturation concentration on all other sampling occasions, showing no significant variation from the control samples as shown on Figure 26.

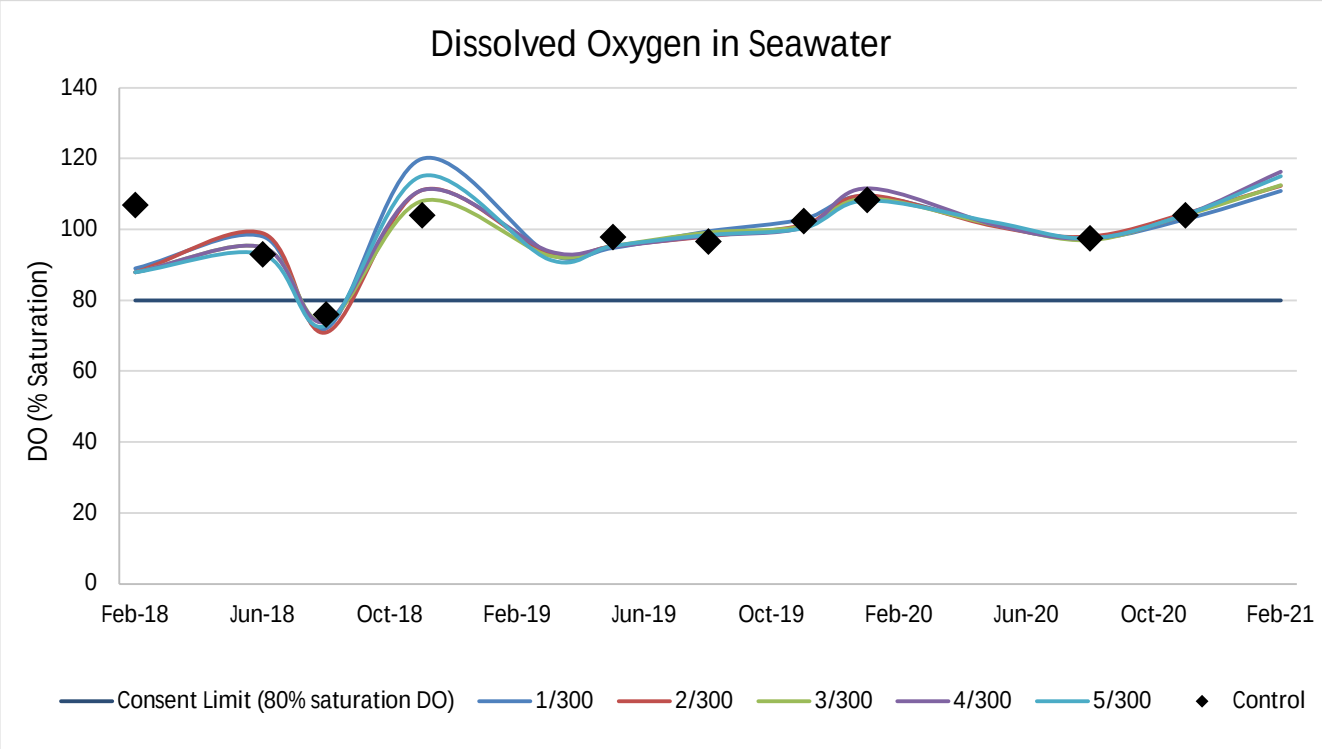

Figure 26 Dissolved Oxygen Concentration during the monitoring period

Temperature

Seawater temperatures were measured in seawater at five points equidistant on a circle centred on the diffuser and with a radius of 300m. Temperatures were also measured at a reference (control) location unlikely to be affected by discharge from the diffuser. The RCCP requires a maximum change in the temperature of no more than 3 degrees Celsius between the measures locations and the control location.

The results of monitoring are shown in Figure 27.

There is less than 1 degree Celsius difference in temperatures between those at the 300m radius locations and the control location. Since this temperature difference is less than the 3 degree Celsius maximum difference in the RCCP, there is 100% compliance.

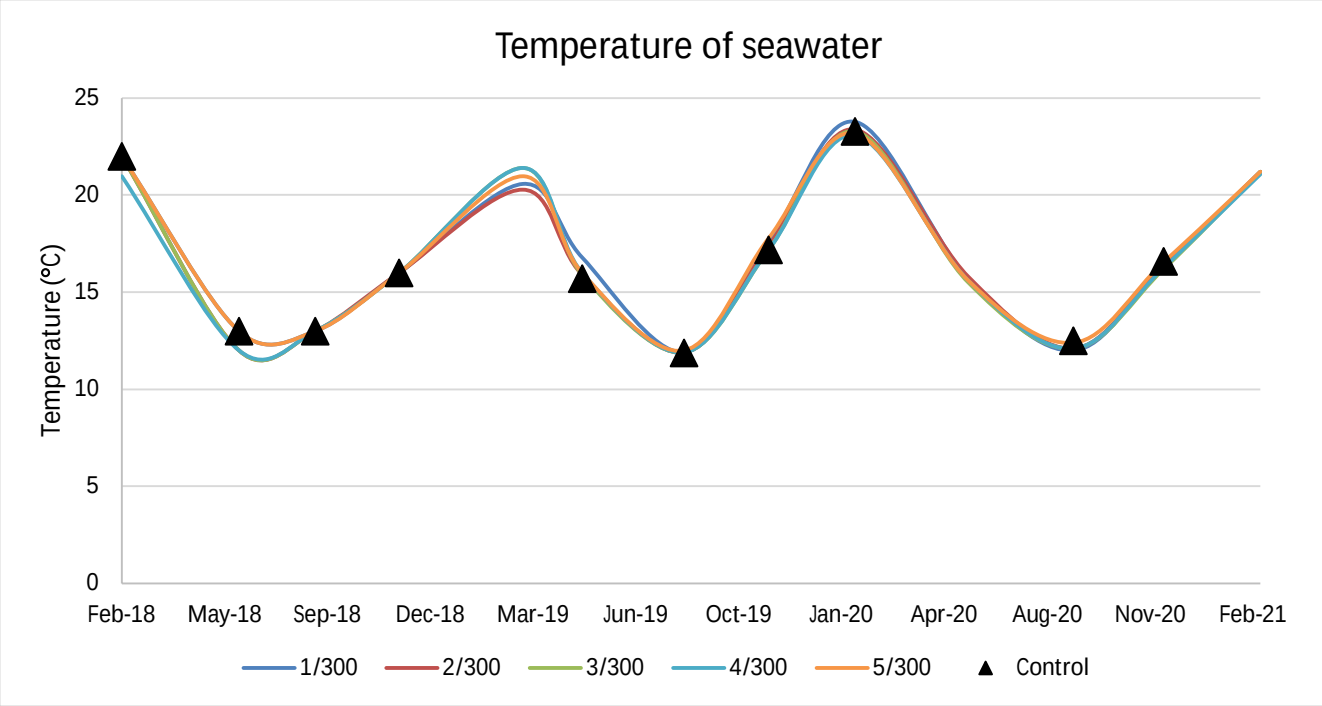

Figure 27 Temperature recorded during the monitoring period

Condition 13 B

This condition is historical and therefore not applicable.

Condition 13 C

A notification was sent to Mr Church via a letter on 21 January 2019 informing of the delayed flushing cycle planned for 28 January 2019.
A notification was sent to Mr Church on 17 February 2020 informing of the delayed flushing cycle occurring on 2 March 2020.

5.11.4 Compliance

Condition 13 A

DO: Dissolved oxygen saturation levels were very similar including on 22nd August 2018 whereby DO levels fell below the 80% saturation level including the control samples which was attributed to potential calibration issues. As a result, a Standard Operating Procedure for calibration was completed to potentially address this issue. All other sampling results for DO saturation levels after August 2018 complied with limit conditions.

Temperature: 100% Compliance

Other Criteria: 100% Compliance. No non- compliances to the conditions outlined in Condition 13 A (i) to (v) and (viii)-were reported during the sampling period.

Condition 13 B

Not Applicable

Condition 13 C

It has been noted that while this condition is being met for the authorised discharge, there are two seepages in the outfall pipeline at approximately 700 metres and 630 metres from shore. Visual monitoring has shown that effects are limited to the immediate plume of the seepages. Sample results show an effect in the immediate plume, but microbial concentrations rapidly decrease with distance from the seepage. No discernible nearshore or alongshore effects have been measured during the reporting period (Appendix I). Virus monitoring in shellfish has also been completed which showed high concentrations within the shellfish up to 500 m of the outfall diffuser centre, but low concentrations with increasing distance to the North. Napier City Council have kept HBRC up to date with actions and progress in relation to discovery and work undertaken in relation to this seepage by way of phone conversations, emails, and meetings. Napier City Council continue to closely monitor the seepages and engaged BECA consultants to provide an engineering solution. A report was provided to HBRC detailing options for repair. The repair to the leak at 630m was successfully completed on 25 October 2020. The leak at 700m was completed on 01 February 2021.

5.12 Condition 14 - Ecotoxicity

5.12.1 Condition

RCCP conditions for this condition have been paraphrased below. The full RCCP conditions can be found in Appendix A of this report.

There shall be no environmentally significant and statistically detectable difference in toxicity between a water sample from uncontaminated water, and the final combined wastewater when diluted 200 times with the uncontaminated water.

5.12.2 Source of Data

Cawthron Institute was commissioned by Napier City Council to carry out quarterly toxicity assessments during periods ending 30 June 2019 and 2020 results included the respective Napier City Council Annual Environmental Reports. Whole effluent wastewater samples were tested on a diatom (Minutocellus polymorphus: 2019 Annual Environmental Report), microgreen algae (Dunaliella tertiolecta: 2020 Annual Environmental Report[2]), wedge shell (Macomona liliana) and blue mussel (Mytilus galloprovincialis) with 48-hour, 96-hour and 48-hour exposure rates, respectively. Endpoint toxicity tests comprised growth inhibition for microgreen algae and survival tests for both wedge shell and blue mussels.

The results of testing on other dates are summarised in a spreadsheet provided by Napier City Council, which indicates test results as either a fail, pass or no test, for three species, being algae, bivalve (Wedge Shell) and bivalve (Blue Mussel).

[2] Cawthron experienced problems with their diatom (Minutocellus polymorphus) during the monitoring period. They have since stopped offering this toxicity test. Dunaliella tertiolecta has been substituted instead and confirmed by HBRC as being a suitable replacement test species.

5.12.3 Analysis of Data: Cawthron Reports

Of the four sampling events in 2019 and again in 2020, no cases of environmentally significant and detectable toxicity differences in the test species with a 200-fold dilution (as per the Consent requirements) were observed.

5.12.4 Compliance

Complies.

The effluent sample tested in 2019 and 2020 by Cawthron complied with the RCCP 'no toxicity' criterion for four species (at 200 fold dilution).

5.13 Condition 15 – Outfall Diffuser

5.13.1 Condition

'The consent holder shall inspect the diffuser at least annually, and at any other time as necessary, at which time any ports blocked by mussels or other debris which may adversely affect the functioning of the diffuser will be cleared. The number of blocked ports shall be recorded and reported to the Regional Council (Manager Compliance) in the annual report required by condition 35 of this consent.'

5.13.2 Analysis of Data

NCC commissioned the annual inspection of the outfall in August 2018, September 2018, April 2019 and May 2019. From this inspection, seepages were discovered at 70 m and 700m offshore during the August 2018 inspection. Additional work included during this reporting period included, diffuser port cleaning, air lifting works, repair work at both 70 m and 700 m offshore, water sampling, and checking of outfall marker buoys during the various inspections.

NCC also commissioned the annual inspection of the outfall in in January/February 2020 and April/May 2020. A second leak was discovered on an old outfall clamp repair site. During this inspection, port inspecting, cleaning and air lifting works were completed. The diffuser inspection undertaken in January 2020 found good flow from 33 ports, 7 blocked and 4 buried. During the April inspection only 5 ports were blocked and 5 buried, the rest had good flow.

The annual environmental reports for 2018/2019 and 2019/2020 contain inspection reports including the number of blocked ports as required by the consent condition.

The inspections identified damage caused by fishing vessels as evidenced by fishing nets caught on the ports, 3 full nets in January and another in the April 2020 inspection. Following this, NCC initiated discussions with maritime authorities to establish a protected area around the outfall and diffuser to provide more robust protection from fishing vessels. The majority of the recommendations from the January inspection were carried out. Further, the repair to the leak at 630m was successfully completed on 25 October 2020. The leak at 700m was completed on 01 February 2021.

5.13.3 Compliance

Complies. Inspection and reporting undertaken as required.

5.14 Condition 16 – Outfall Pipe and Diffuser

5.14.1 Condition

'The consent holder shall maintain the outfall pipe and diffuser in good condition in accordance with appropriate engineering practice.'

5.14.2 Analysis of Data

As noted in the previous condition, records of inspections and cleaning works commissioned by NCC are presented in the annual environmental reports for the period covered in this performance report.

Napier City Council have planned further works during the 2021 financial year to repair the outfall pipeline leaks at approximately 700 metres and 640 metres from shore. BECA consultants completed an Issues and Options report on 15 May 2020 to provide an engineering solution for the pipeline leak. The repair to the leak at 630m was successfully completed on 25 October 2020. The leak at 700m was completed on 01 February 2021.

5.14.3 Compliance

Complies.

5.15 Condition 17 – Discharge Measurement

5.15.1 Condition

'The consent holder shall continuously monitor and record the rate of discharge and the daily volume of final combined wastewater discharged using a method with an accuracy of +/- 5%.'

5.15.2 Analysis of Data

The daily discharge volume of the wastewater has been continuously monitored and recorded using an ultrasonic flowmeter installed on the final discharge pipe. NCC have noted that while the ultrasonic meter is accurate, it is not able to be relied on at all times due to complications around gravity flow leading to partially full pipes at times and air being introduced through pump cavitation from the final wet well. As a result, NCC also monitor and record discharge rate and total daily volumes by a flume on the domestic and non-separable inflow, and three magnetic flow meters on the industrial inflow lines to provide a totalised inflow to the WWTP to provide flow data when the effluent flow meter does not. These four meters as well as the three utilised for the BTF operations ("tank 1", "tank 2", and "recycle") were calibrated in late June/early July 2018. Six of the seven meters passed calibration and are working within +/-1% of their original calibration. The BTF "Tank 1" flow meter was given a marginal pass. NCC proposed to investigate options for long-term accuracy.

5.15.3 Compliance

Complies.

5.16 Condition 18 – Toxicity Testing

5.16.1 Condition

At quarterly intervals, with a minimum of 2 months between each sample, the consent holder shall test the toxicity, as described in condition 14.

5.16.2 Analysis of Data

NCC commissioned Cawthron to undertake toxicity sampling at the 200-fold dilution level. Quarterly tests were undertaken in August & November 2018, March & May 2019, August & November 2019, and February & May 2020 as required.

5.16.3 Compliance

Complies.

5.17 Condition 19 – Analyte Testing on Consecutive Days

5.17.1 Condition

RCCP conditions for this condition have been paraphrased below. The full RCCP conditions can be found in Appendix A of this report.

Quarterly samples of the 24 hour flow proportional samples of the combined final wastewater stream discharged on 7 consecutive days shall be tested for analytes listed in Schedule 1.

5.17.2 Source of Data

Samples were taken from the combined wastewater stream prior to discharge into the marine outfall. The results of analyte testing are summarised in a spreadsheet provided by Napier City Council and titled, '2012 Consent Results'

5.17.3 Analysis of Data

Quarterly samples have been taken from August 2018 through to February 2021 for the following analytes at the detection limit shown in Table 5 as required.

Table 5 Analytes for combined wastewater stream and applicable detection limit

Analyte	Detection Limit
Temperature	
pH	0.2
Oil and Grease	4
Suspended Solids	3
NH4-N	0.01
cBOD5	1

Analyte	Detection Limit
Sulphide	0.002
Zn	0.001
As	0.001
Cd	0.0005
Cr III	0.0005
Cr VI	0.001
Cu	0.0005
Sn	0.005
Ni	0.0005
Pb	0.0001
Hg	0.00008

5.17.4 Compliance

Complies.

Samples have been taken in accordance with the Condition 19.

5.18 Condition 20 – Quarterly Biological Trickling Filter Performance Monitoring

5.18.1 Condition

'At quarterly intervals, with a minimum of 2 months between each sampling run, the consent holder shall monitor the performance of the biological trickling filter by taking 24 hour flow proportional samples of wastewater prior to and immediately after the biological trickling filter treatment (prior to mixing with the final combined wastewater flow). These samples shall be analysed for the following:

i) Suspended Solids
ii) Oil and Grease
iii) $cBOD_5$'

5.18.2 Source of Data

Data on the performance of the BTF has been provided by Napier City Council in the spreadsheet "2012 Consent Results". The sampling locations are upstream and downstream of the BTF.

5.18.3 Analysis of Data

Samples of raw wastewater and BTF treated wastewater have been taken at quarterly intervals and analysed for Suspended Solids, $cBOD_5$ and Oil and Grease.

The results are presented in the following figures.

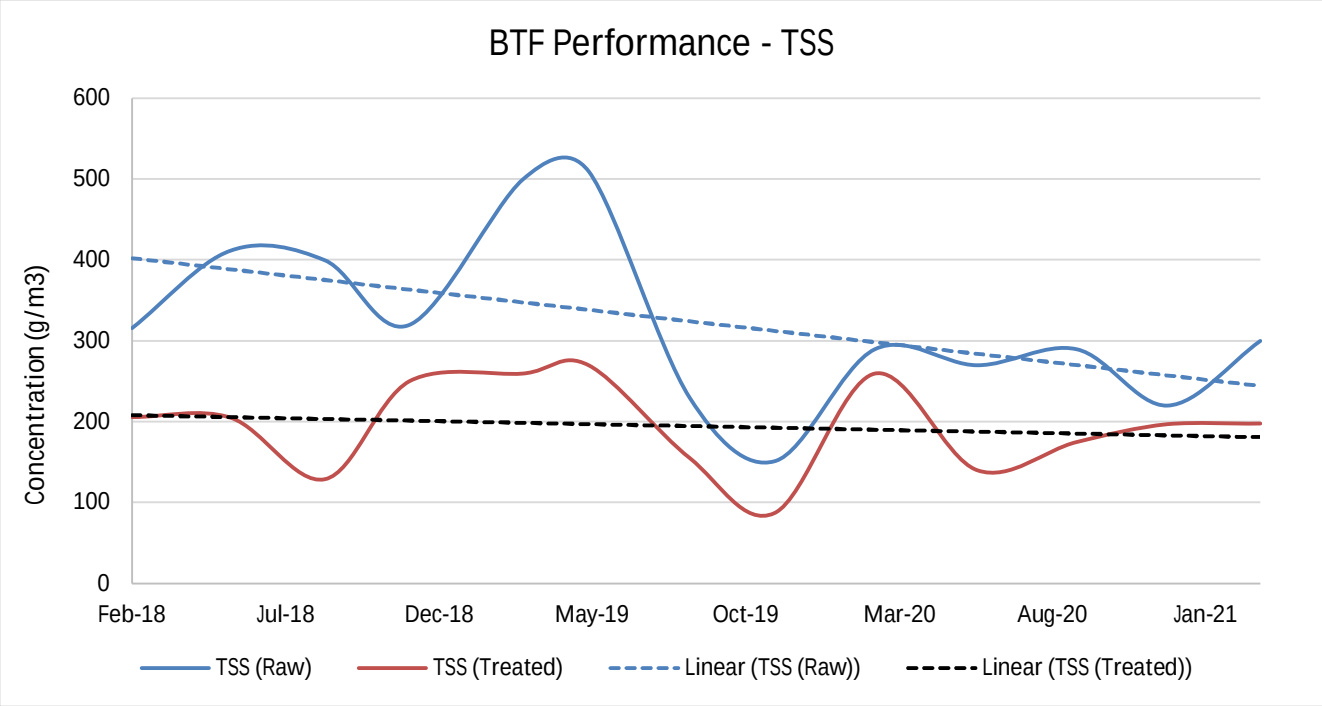

Figure 28 Quarterly biological trickling filter performance – TSS monitoring

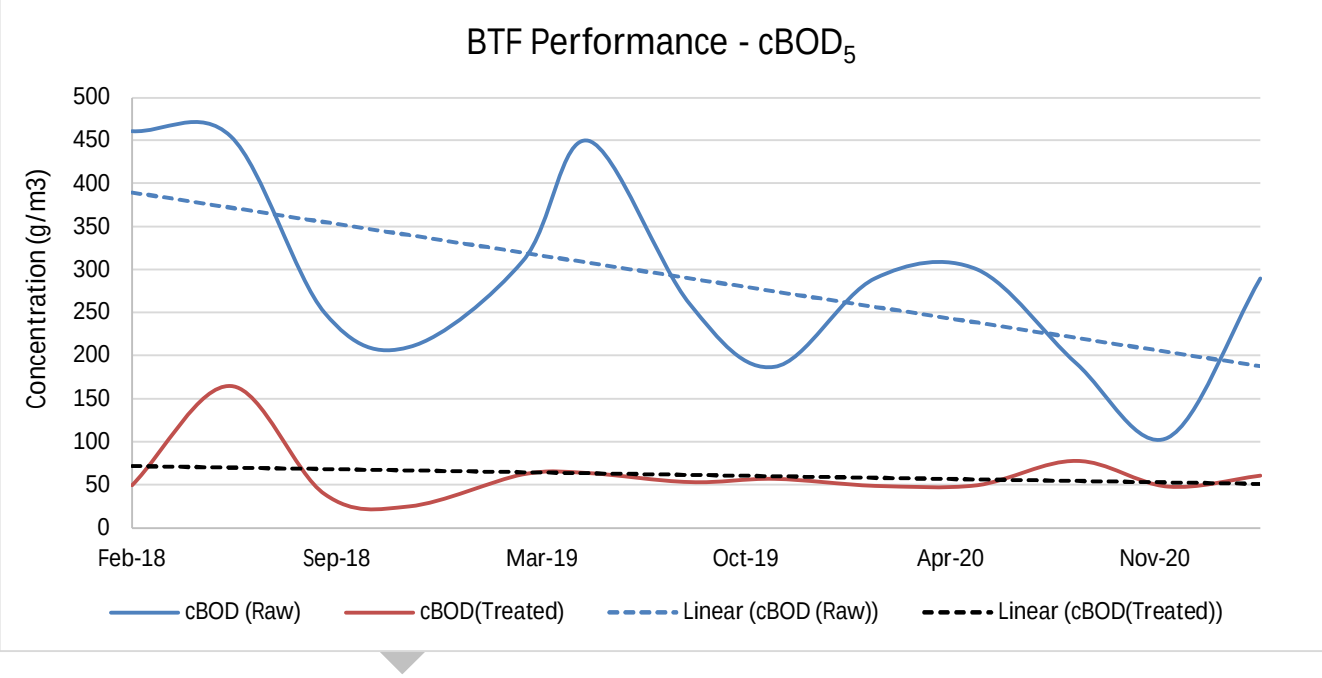

Figure 29 Quarterly biological trickling filter performance – $cBOD_5$ monitoring

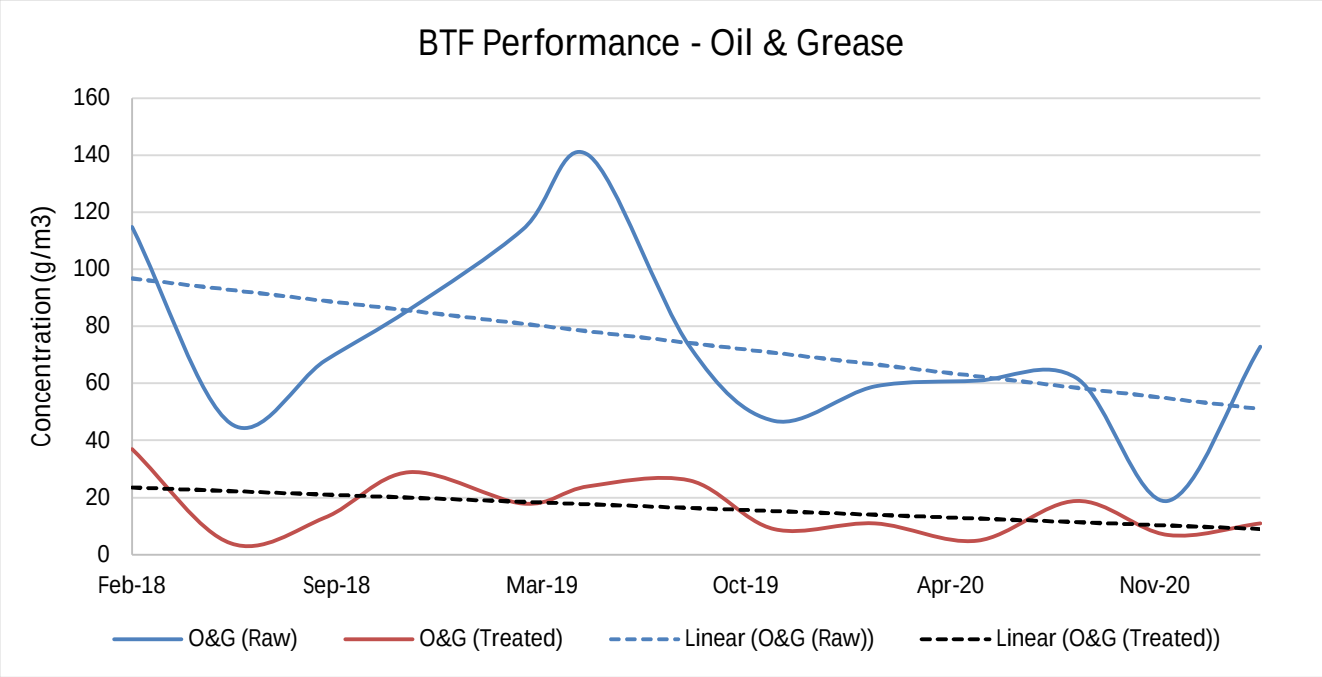

Figure 30 Quarterly biological trickling filter performance – oil and grease monitoring

5.18.4 Compliance

Complies. Samples have been taken and analysed in accordance with the condition requirements.

There were significant fluctuations in the TSS concentrations in the raw wastewater which could be attributed to the industrial / trade waste contributions. Significant fluctuations in solid loading to the BTF can potentially affect biological activity resulting in reduced treatment efficiency. Trend lines of the untreated and treated wastewater show a decrease in suspended solid loadings. The trend in the TSS loadings in treated effluent followed the trend in TSS loadings in untreated wastewater as expected, assuming the BTF operates within the design range for TSS removal efficiency. Over the monitoring period, it is noted that the TSS removal efficiency of the BTF has been decreasing (represented in Figure 28 by the 'seemingly' converging trendlines). For example, in February 2020, the TSS removal efficiency was as low as 10%. NCC is investigating this drop in treatment capacity. It is understood however that TSS contains both a biodegradable and non-biodegradable fraction. It is the biodegradable fraction that would be consumed by the microbes in the BTF, resulting in TSS reduction in the treated effluent. $cBOD_5$ also incorporates the biodegradable fraction of TSS hence TSS removal would be related to $cBOD_5$ removal, however there are other factors that influence overall BTF efficiency. NCC could conduct a wastewater quality assessment from all the individual contributors particularly the trade waste customers to investigate the fluctuations in TSS loadings.

The biochemical oxygen demand is trending down at a greater rate in the influent than the effluent. It is noted that while the data suggests that biological activity is currently satisfactory, the cBOD removal efficiency of the BTF has been decreasing (represented in Figure 29 by the 'seemingly' converging trendlines) representing a risk that further increases in BOD concentrations and loadings could result in a reduction in performance. As noted in Condition 6, the annual average $cBOD_5$ loading limit to the BTF has been exceeded consistently. As a result, BTF performance will need to consider and manage organic loadings from the catchment, particularly from industrial flows.

The oil and grease level is trending down at a greater rate in the influent than the effluent, a similar trend observed in TSS and $cBOD_5$. The downtrend in the influent parameters is typically reflective of the catchment characteristics. The oil and grease removal efficiency of the BTF (as observed on Figure 30) is also decreasing. This will need to be investigated. NCC could commission a plant-wide process capability assessment to investigate potential bottlenecks in the treatment systems.

5.19 Condition 21 – Norovirus

5.19.1 Condition

'At monthly intervals, for a minimum of 12 months after commissioning of the upgrade required by condition 6, the consent holder shall take a grab sample of the final combined wastewater flow. The samples shall be tested quantitatively for noroviruses by polymerase chain reaction (PCR).'

5.19.2 Source of Data

- Compliance monitoring report for the period 01 July 2019 to 30 June 2020 prepared by Hawkes Bay Regional Council
- Response to review comments on NIWA report "Review of microbial data associated with Napier wastewater outfall" letter by NIWA

5.19.3 Analysis of Data

Though this condition is historical, NIWA completed a review of available information to consider if it would affect the outcome of repeating the 2016 Quantitative Microbial Risk Assessment (QMRA), in line with the 30 May 2019 Resource Consent review conditions. The outcome of the review indicated that there was no need to repeat the earlier QMRA hence condition 21 is not applicable at this stage.

5.19.4 Compliance

Complies. Condition 21 not applicable.

5.20 Condition 22 – Faecal Coliforms and Enterococci

5.20.1 Condition

RCCP conditions for this condition have been paraphrased below. The full RCCP conditions can be found in Appendix A of this report.

At quarterly intervals take six flow proportional flow samples of the final combined wastewater stream, (at 4 hourly intervals), and analysed for faecal coliform and enterococci.

5.20.2 Source of Data

Samples taken from the combined wastewater stream have been analysed, and the results recorded by Napier City Council in a spreadsheet titled '2012 Consent Results'.

5.20.3 Analysis of Data

Faecal coliform and enterococci have been sampled and tested in accordance with Condition 22 of the Resource Consent. The monitored concentrations are shown on the following graphs.

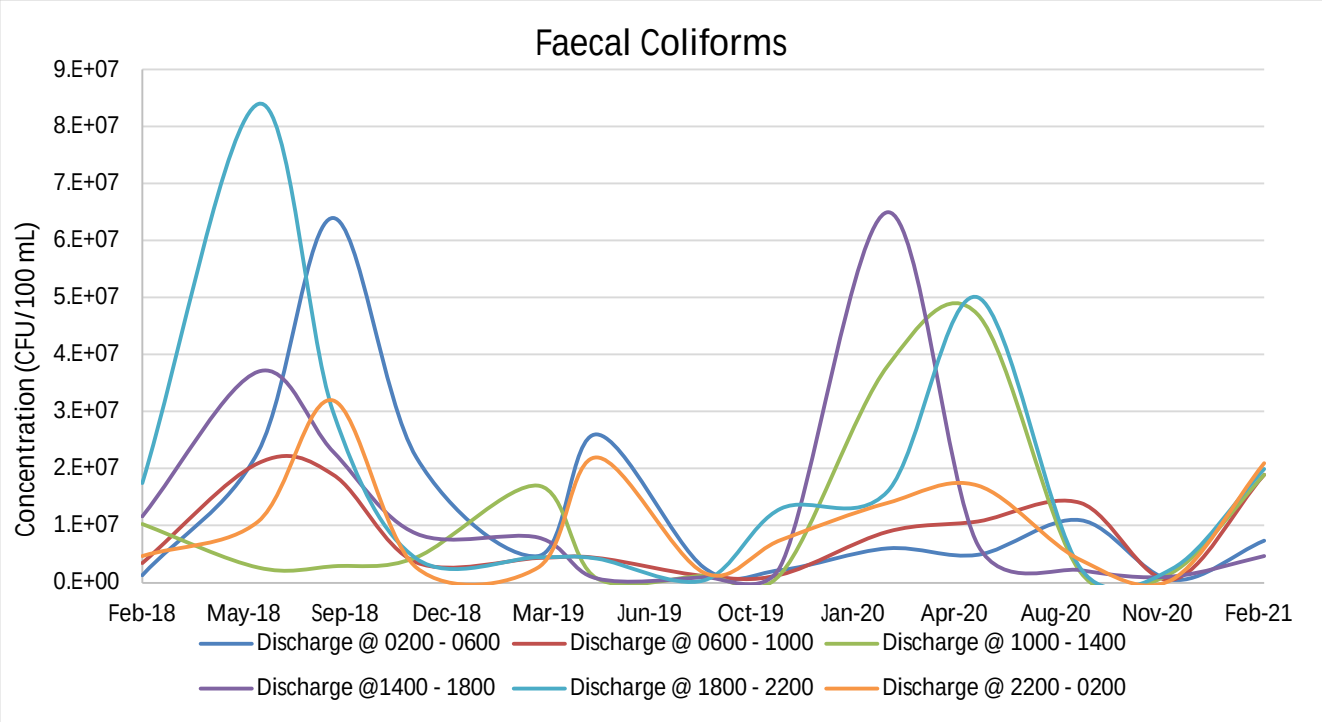

Figure 31 Quarterly monitoring of faecal coliforms in combined wastewater

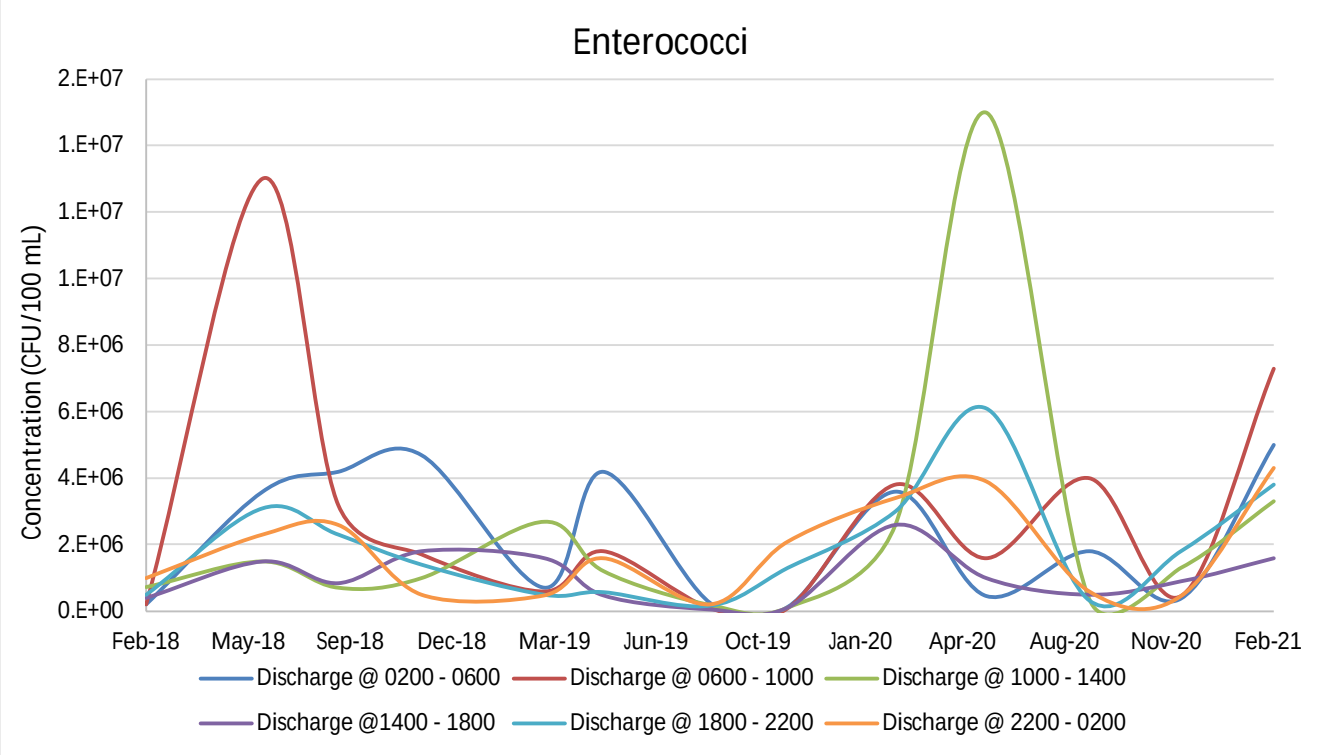

Figure 32 Quarterly monitoring of enterococci in combined wastewater

5.20.4 Compliance

Complies.

Samples have been taken and analysed in accordance with Condition 22.

5.21 Condition 23 – Seabed Sediment Samples

5.21.1 Condition

'Twice during the year the consent holder shall take seabed sediment grab samples from four sites, being located at distances of 300m and 500m to the north, and 300m and 500m to the south of the midpoint of the outfall diffuser. Those samples shall be analysed for the analytes listed, and at the detection limits shown, in Schedule 2.'

5.21.2 Source of Data

Test results from sediment sampling has been provided on the NCC spreadsheet titled 'Sediment Analysis'.

5.21.3 Analysis of Data

With regards to understanding the risk of adverse effects to the environment the Australian and New Zealand Environment Conservation Council (ANZECC) 2000 provides a framework for preserving marine water quality. The guidelines recognise the fate of the contaminants in sediments as a sink and a source of bioavailable contaminates to benthic biota and hence potentially to the aquatic food chain. This document provides upper values as a guide to assess the risk of adverse effects to the environment. The following table summarises the schedule 2 detection limits and the ANZECC trigger and upper limits for sediments in marine environments:

Table 6 ANZECC marine trigger limits compared with Schedule 2 detection limits

Analyte	Detection limit (mg/kg) Schedule 2	ANZECC low trigger value guidelines (mg/kg)	ANZECC upper trigger value guidelines (mg/kg)
Arsenic	0.001	20	70
Cadmium	0.00005	1.5	10
Chromium	0.0005	80	370
Copper	0.0005	65	270
Mercury	0.00008	0.15	1
Nickel	0.0005	21	52
Lead	0.0001	50	220
Tin	0.0005	Not stated	Not stated
Zinc	0.001	200	410

Analyte concentrations in sediment samples at 300m and 500m to the north and south of the diffuser, between 2001 and 2020 are shown on the following graphs. The black line represents the date of commissioning for the BTF plant.

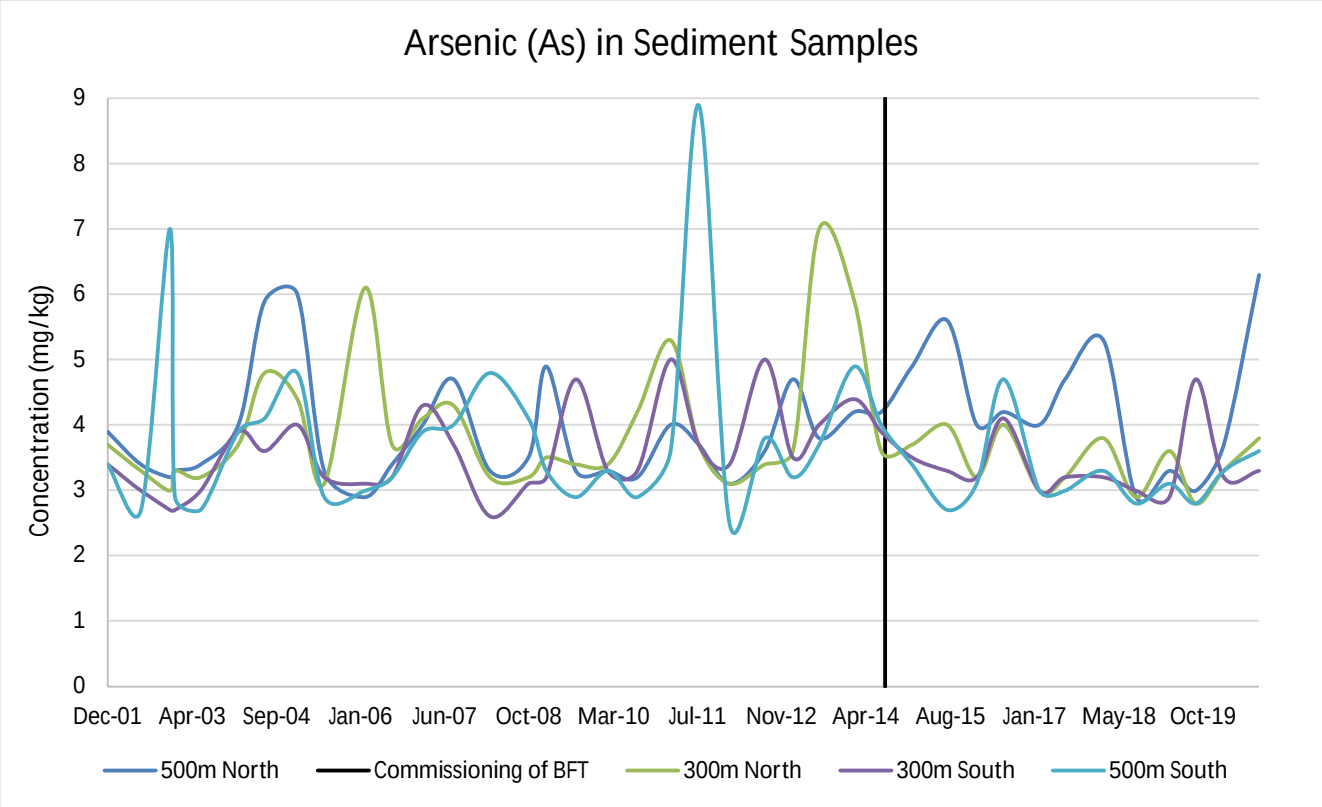

Figure 33 Bi-annual arsenic monitoring

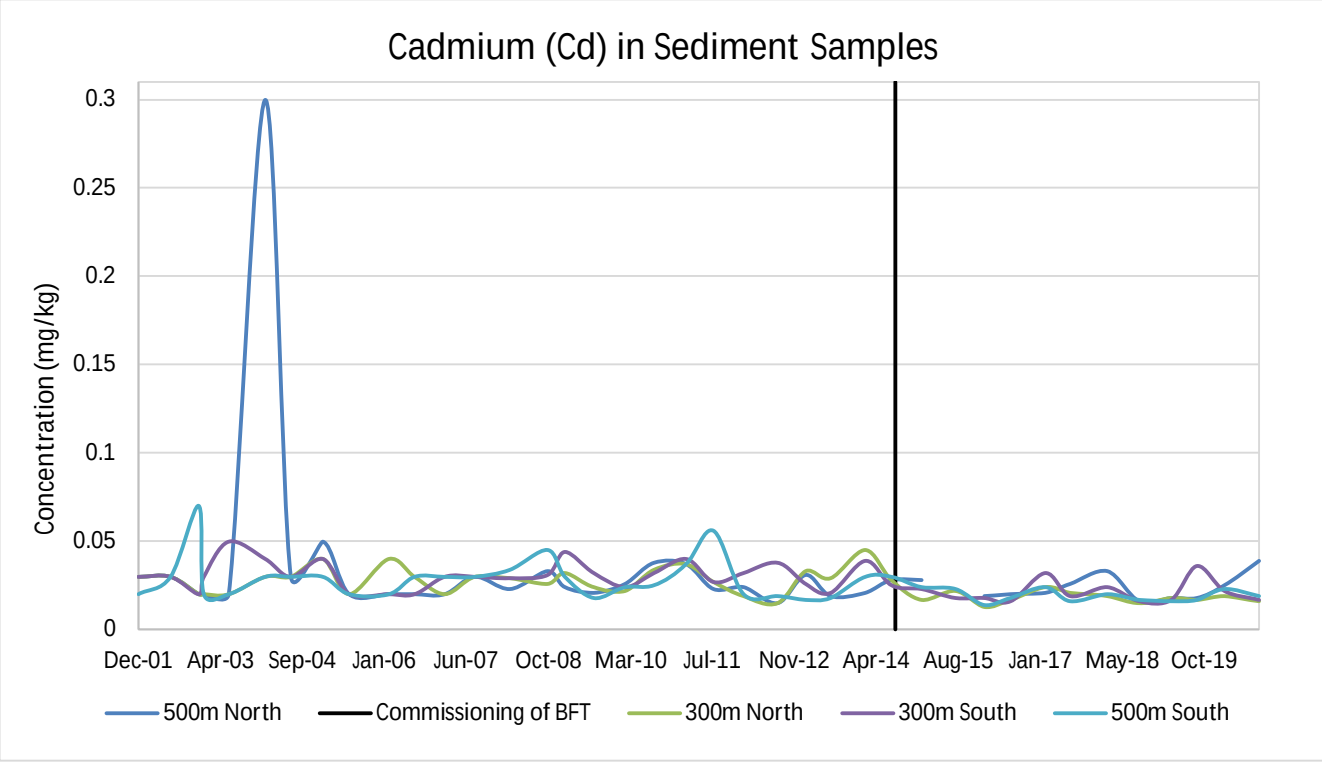

Figure 34 Bi-annual cadmium monitoring

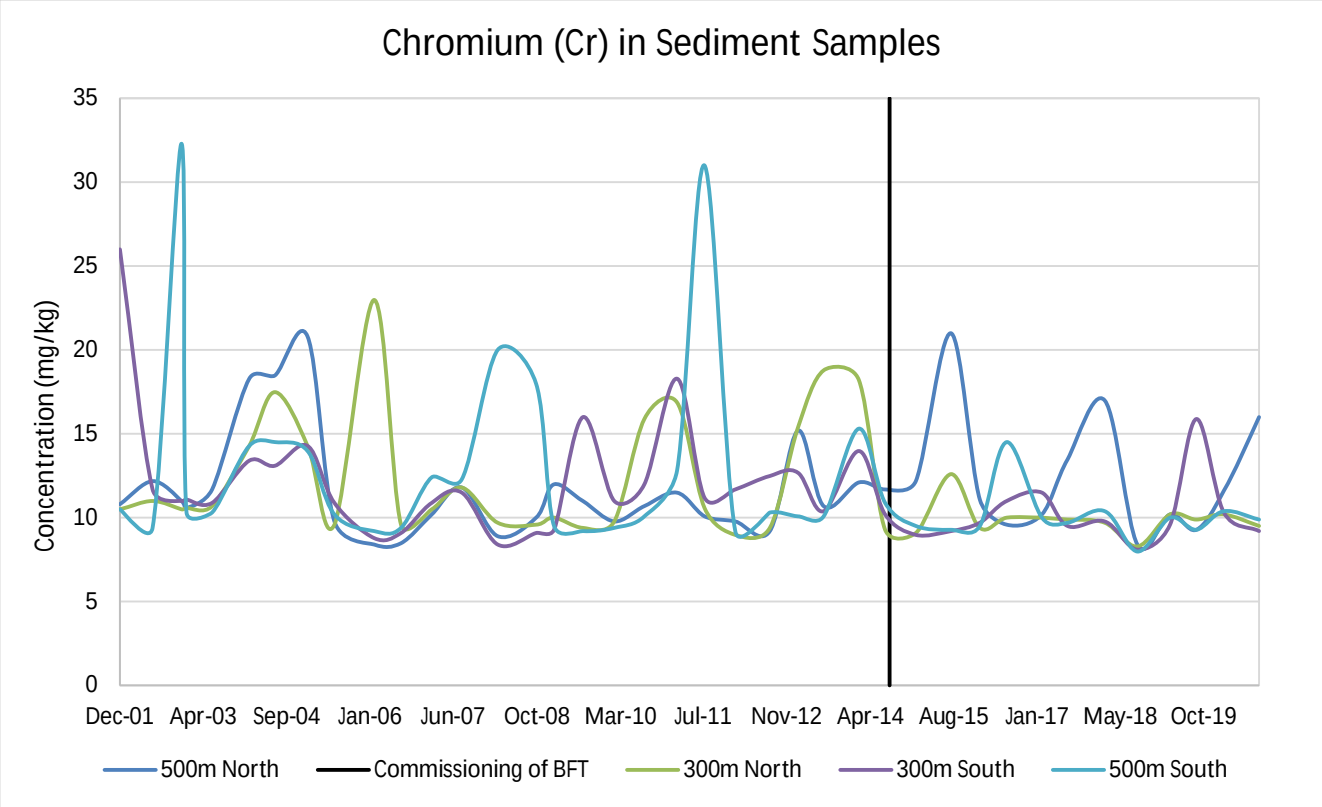

Figure 35 Bi-annual chromium monitoring

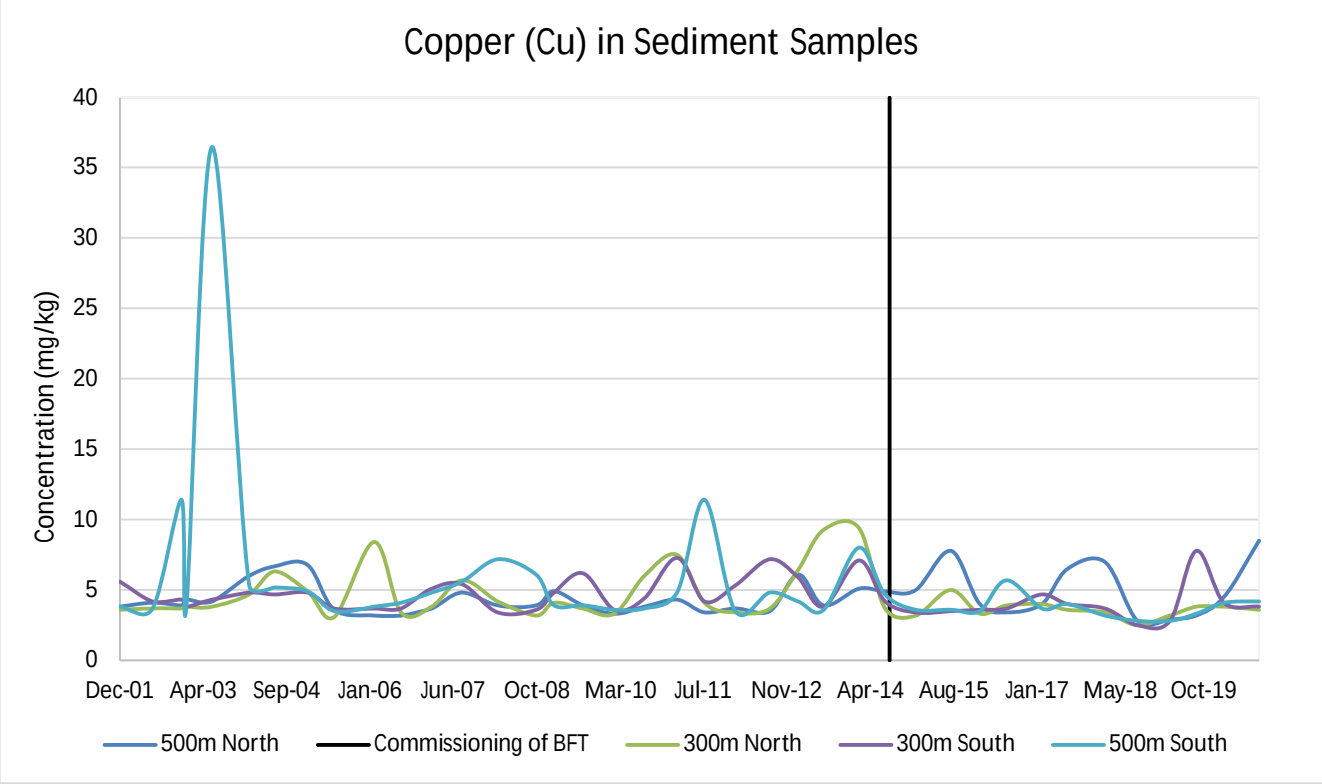

Figure 36 Bi-annual copper monitoring

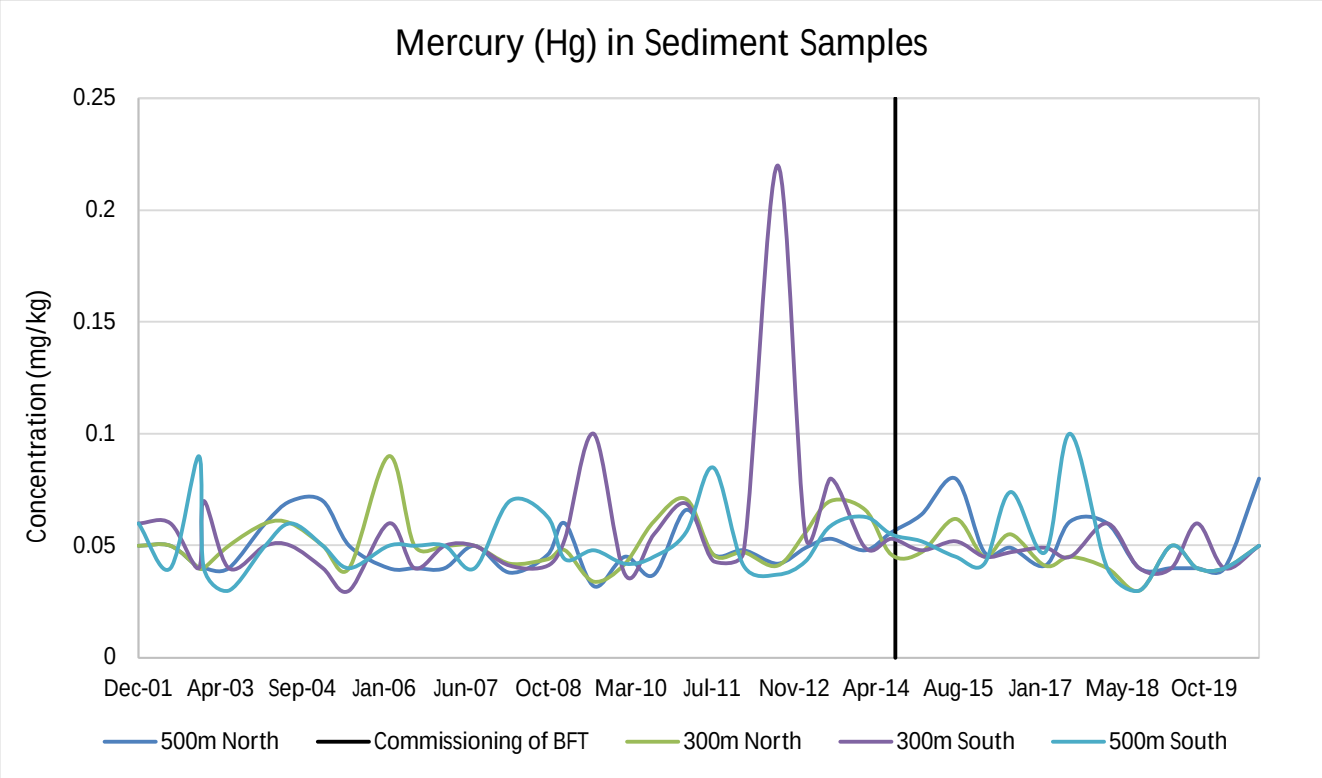

Figure 37 Bi-annual mercury monitoring

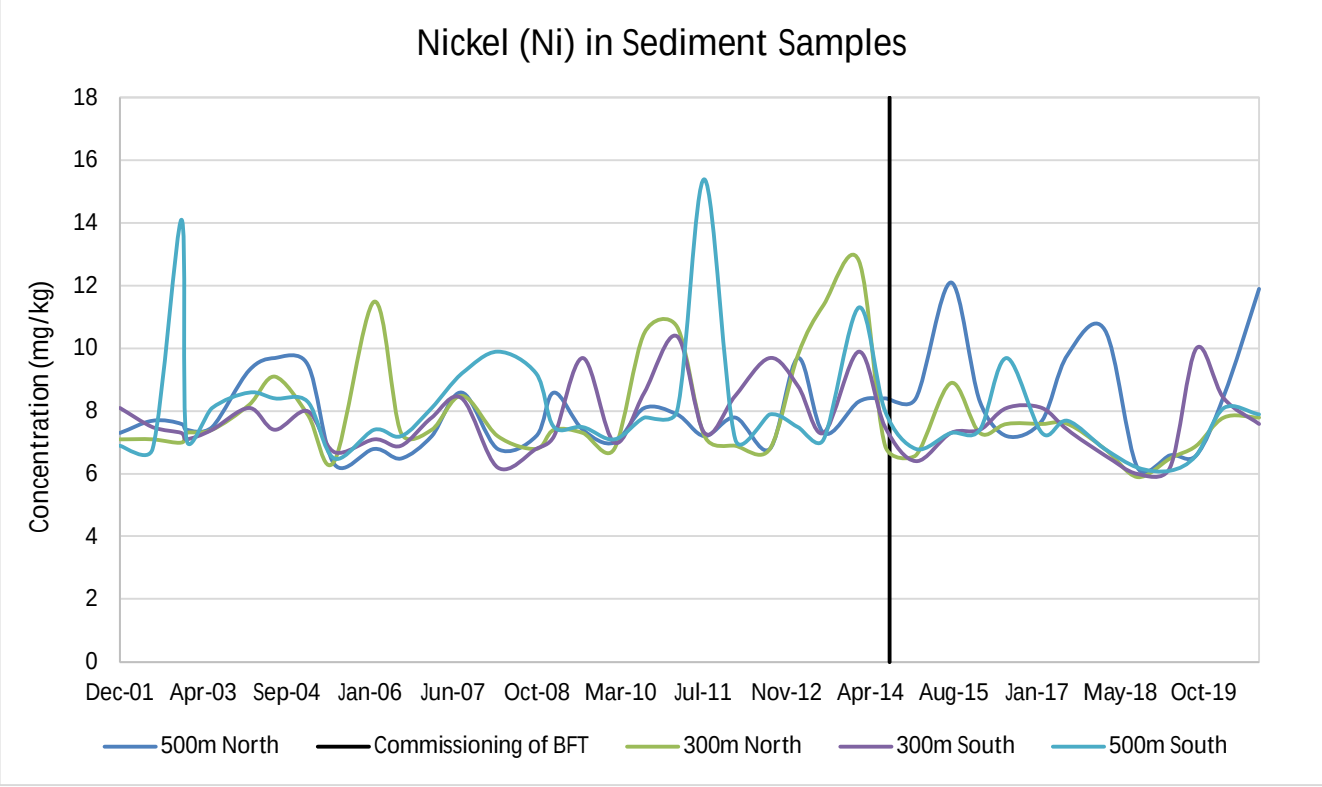

Figure 38 Bi-annual nickel monitoring

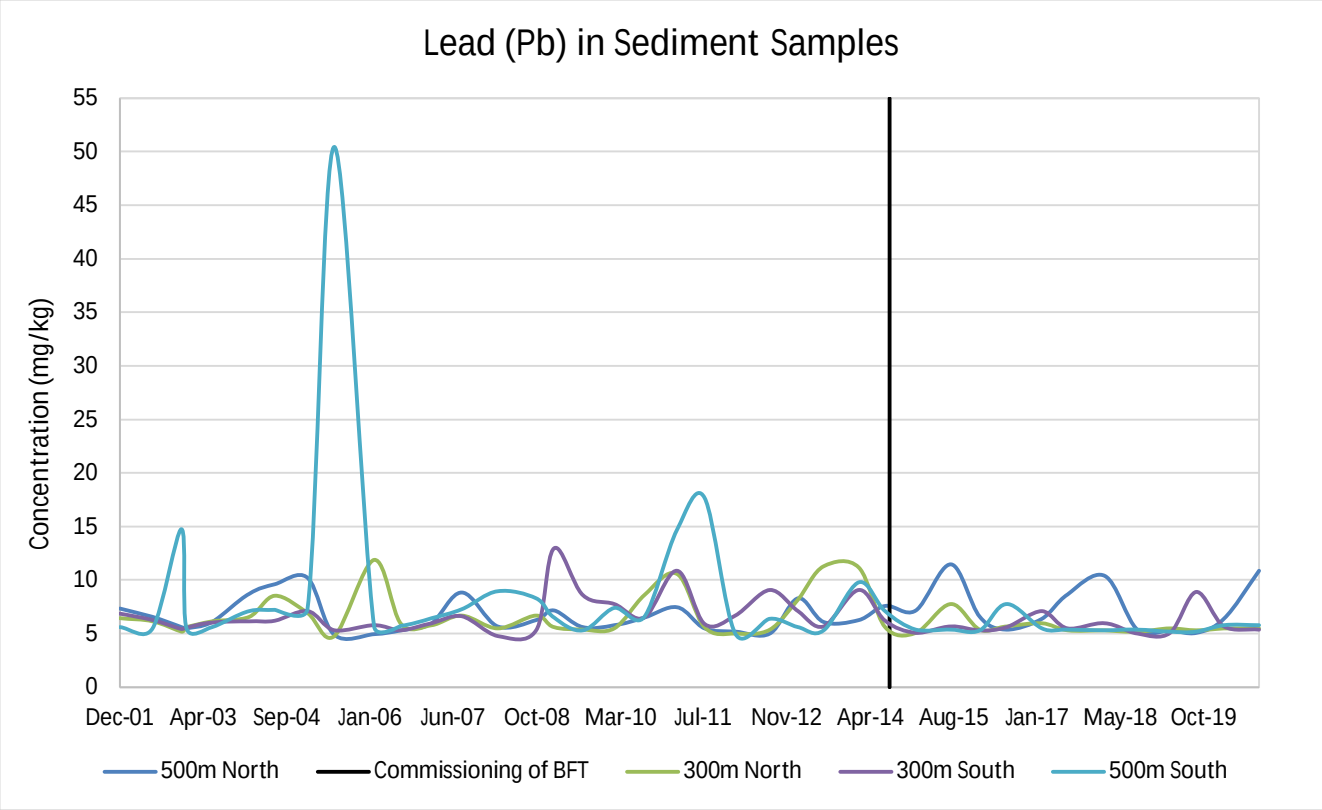

Figure 39 Bi-annual lead monitoring

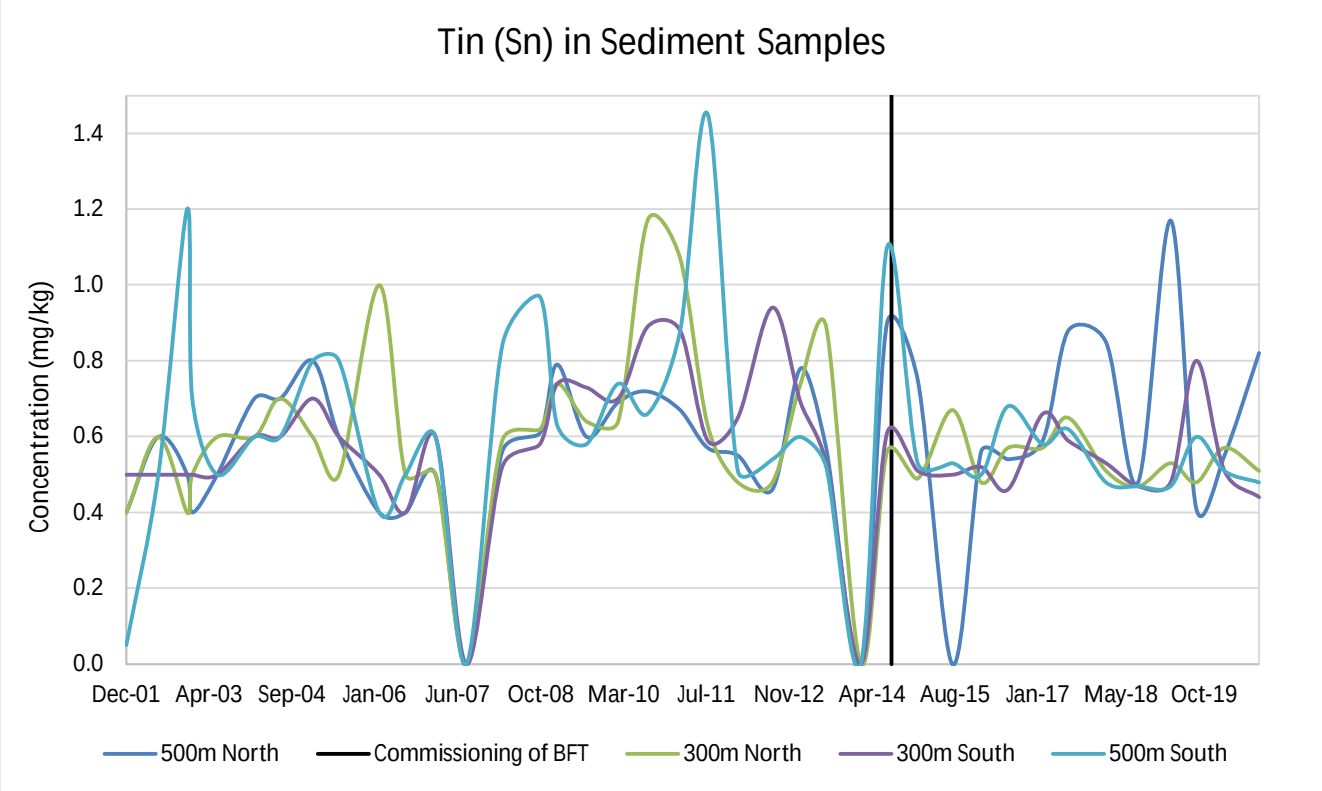

Figure 40 Bi-annual tin monitoring

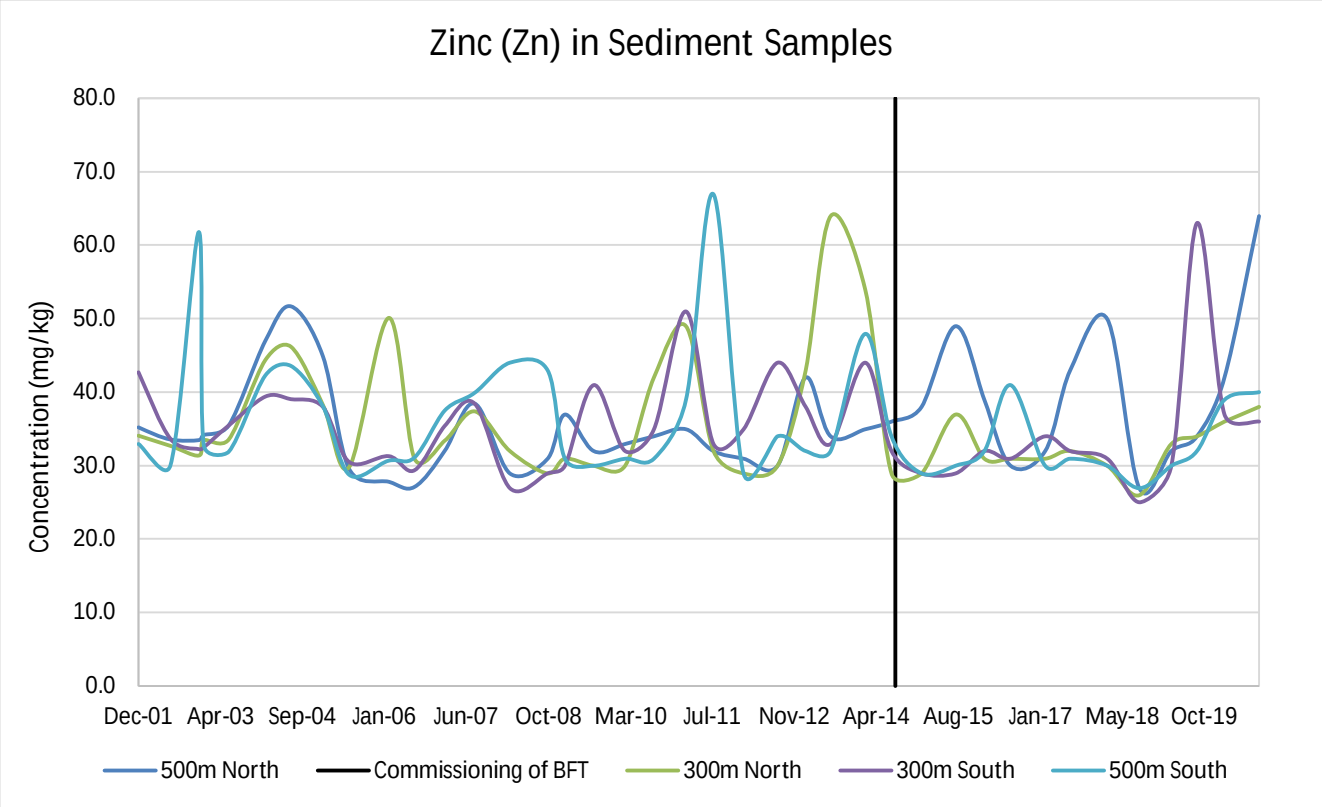

Figure 41 Bi-annual zinc monitoring

5.21.4 Compliance

Complies.

Samples have been taken and analysed in accordance with RCCP Condition 23.

From the graphs above, it is noted that fluctuations in analyte concentrations in sediments at 300m to the North of the diffuser tend to reduce post-commissioning of the BTF plant however data from sediments at other locations has not shown any conclusive trend. Also since many of these metals are resilient, even with a reduction in effluent loadings, it may take many years for any significant reduction to occur in the sediment concentrations. Even so, the levels of all heavy metals are below the ANZECC trigger levels during the monitoring period.

5.22 Condition 24 – Quarterly Seawater Sampling

5.22.1 Condition

'At quarterly intervals, with a minimum of 2 months between each sampling run, the consent holder shall undertake water quality monitoring. The sampling shall be of seawater at 5 sites equally spaced around a circle of 250m radius from the centre of the diffuser. This shall be repeated at a circle of 300m and 500m radius, giving a total of 15 monitoring sites around the diffuser. On the same day a 'reference' seawater sample shall also be taken at least 1000m from the centre of the diffuser at a location unlikely to be influenced by the discharge. All samples shall be tested for faecal coliform and enterococci concentrations. Measurements of the following shall also be taken at each sampling location:

i) pH
ii) turbidity
iii) temperature
iv) dissolved oxygen (% saturation).'

5.22.2 Source of Data

Data on the performance of the BTF has been provided by Napier City Council in the spreadsheet "2012 Consent Results".

5.22.3 Analysis of Data

Water quality samples were taken from fifteen locations, comprising five locations at distances of 250m, 300m and 500m from the centre of the diffuser. The five locations are equally spaced around a circle the required distance from the diffuser.

The Australian and New Zealand Environment Conservation Council (ANZECC) 2000 provide a framework for preserving marine water quality. This document provides trigger values as a guide to assess the risk of adverse effects to the environment. Faecal coliforms, measured in colony forming units, are a measure of the anaerobic bacterium from the intestines of warm blooded animals. Enterococci are lactic acid bacteria and are significantly robust and will survive in seawater. The guidelines identify trigger levels for both bathing waters and marine environments. Table 7 below summarises the ANZECC guideline trigger values for marine environments.

Table 7 ANZECC 2000 trigger values – marine environment

Dissolved Oxygen	pH	Turbidity (NTU)	Faecal Coliforms (median content)	Enterococci (median content)
90-110%	8 - 8.4	1 - 20	1000 CFU/100ml*	230 CFU/100ml*

* The guidelines also recommend maximum concentrations for any one sample of Enterococci to be less than 450-700 CFU/100ml, and for Faecal Coliforms to be less than 4000 CFU/100 ml.

The RCCP Condition 13 limits for Temperature and Dissolved Oxygen (DO) impacts at a distance of greater than 300m from the diffuser are as per Table 8 below.

Table 8 RCCP limits for temperature and dissolved oxygen

Temperature	Dissolved Oxygen
A change in the natural temperature of the receiving water of more than 3-degrees Celsius	The dissolved oxygen concentration to be less than 80% of the saturation concentration

Faecal Coliforms

The concentration of faecal coliforms at monitoring locations since commissioning is shown in Figure 42. The first number represents the site number and the second number the distance from the centre of the diffuser. The reference value has been taken 1000m from the diffuser.

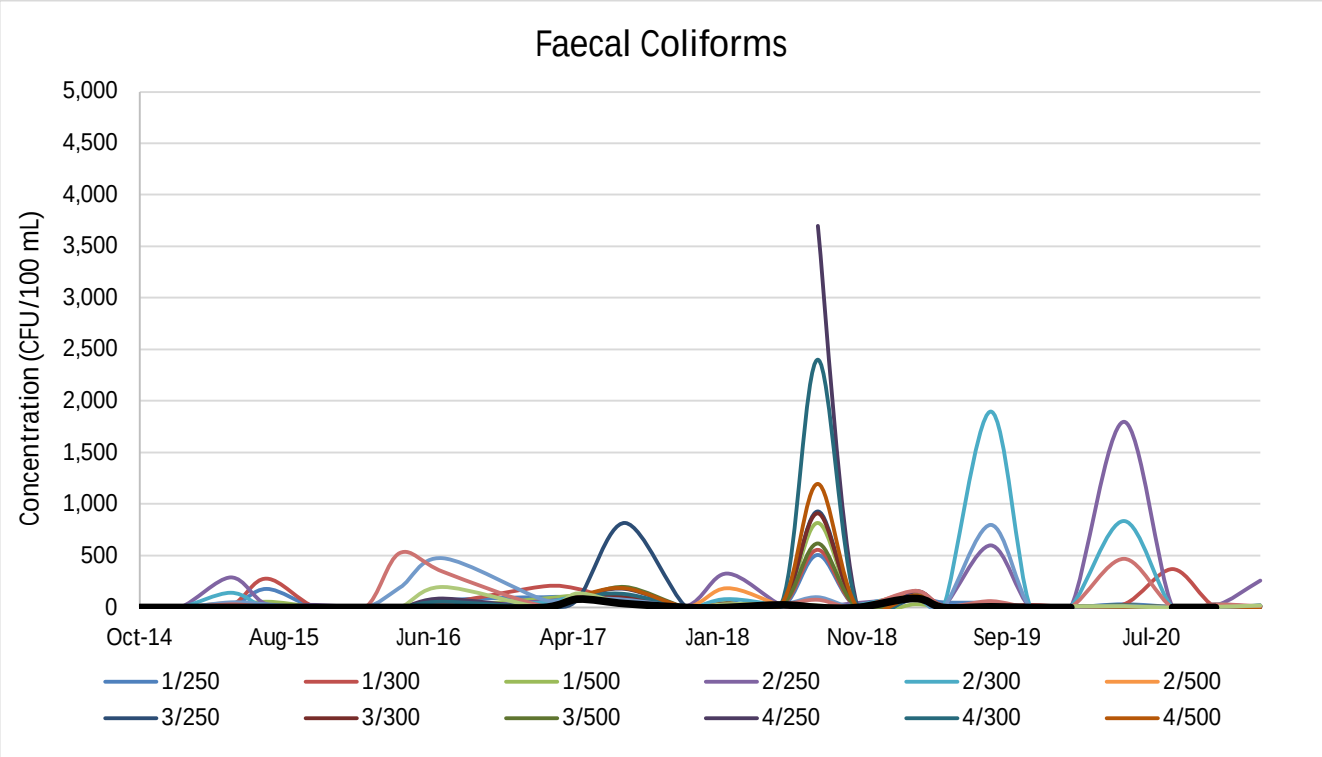

Figure 42 Quarterly faecal coliforms monitoring since commissioning

Table 9 below summarises the median values of faecal coliform samples at various distances from the diffuser, and the maximum values for all distances. All the median values shown are less than the ANZECC trigger value of 1000 CFU/100ml. The maximum concentrations for all distances are also less than the guideline value of 4000 CFU/100ml.

Table 9 Median concentrations of faecal coliforms at various distances

Site	Median values at 250m (CFU/100 mL)	Median values at 300m (CFU/100 mL)	Median values at 500m (CFU/100 mL)	Maximum for all distances (CFU/100 mL)
1	9	20	8	820
2	23	15	5	1900
3	3	2	2	930

Site	Median values at 250m (CFU/100 mL)	Median values at 300m (CFU/100 mL)	Median values at 500m (CFU/100 mL)	Maximum for all distances (CFU/100 mL)
4	2	7	2	3700
5	20	20	7	800

Enterococci

The enterococci count at monitoring locations since commissioning of the BTF are shown in Figure 43. The first number represents the site number and the second number the distance from the centre of the diffuser. The reference location is 1000m from the diffuser.

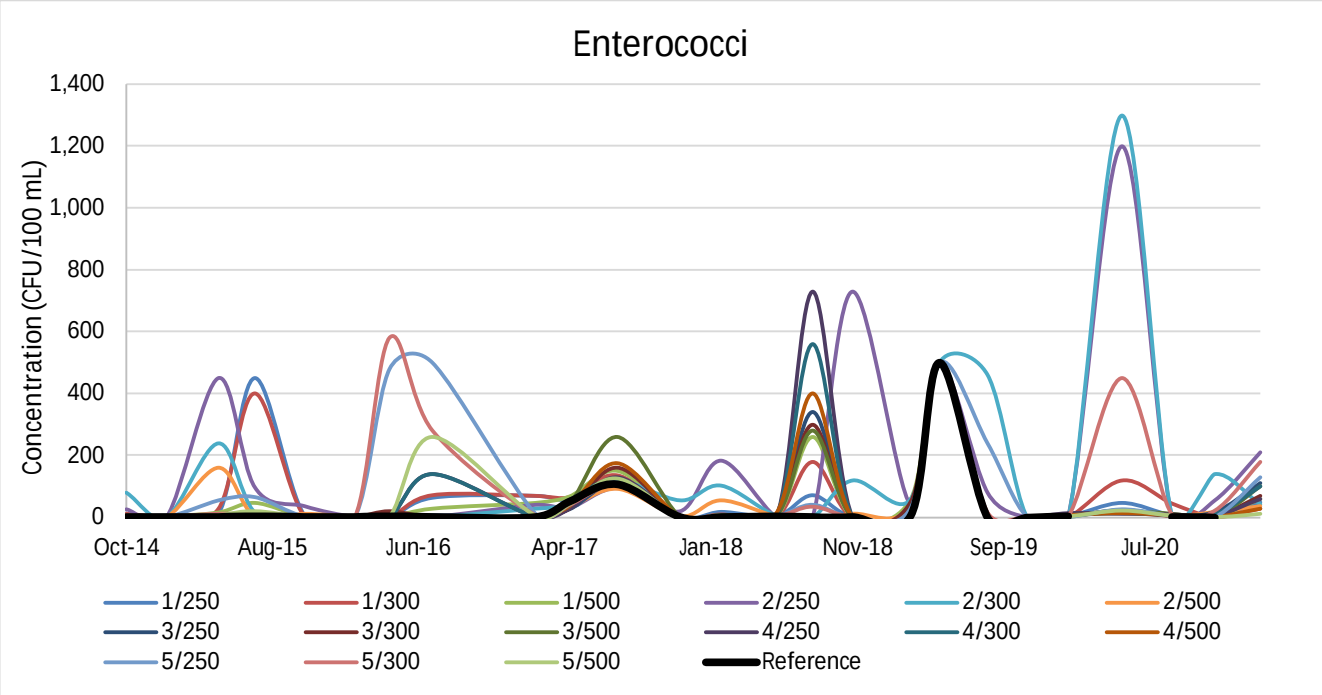

Figure 43 Quarterly enterococci monitoring since commissioning

Table 10 summarises the median and maximum Enterococci counts at the five monitoring locations for each distance (250m, 300m and 500m) from the diffuser. All median values are less than the median trigger value of 230 CFU/100ml however the maximum counts do exceed the recommended ANZECC maximum value for any one sample of 450-700 CFU/100ml. These high concentrations of enterococci above the recommended guideline values were recorded in August 2018, November 2018, May 2019[3], and May 2020 and are within or at the mixing zone. It is noted that in May 2019, enterococci concentrations at the reference location were also higher than the recommended guideline value. Further, while there were two reported pipeline leaks, the repair to the leak at 630m was successfully completed on 25 October 2020 and the leak at 700m was completed on 01 February 2021.

[3] The May 2019 results should be treated with caution as this was a result of laboratory test method level of detection being insufficient. NCC has since confirmed with the laboratory requirements for this test.

Table 10 Median and maximum enterococci counts

Site	Median values at 250m (CFU/100 mL)	Median values at 300m (CFU/100 mL)	Median values at 500m (CFU/100 mL)	Maximum for all distances (CFU/100 mL)
1	10	14	6	500
2	38	42	8	1300
3	5	5	2	500
4	5	5	4	730
5	11	10	5	580

pH

The pH at monitoring locations since commissioning is shown in Figure 44. The first number represents the site number and the second number the distance from the centre of the diffuser. The reference location is 1000m from the diffuser.

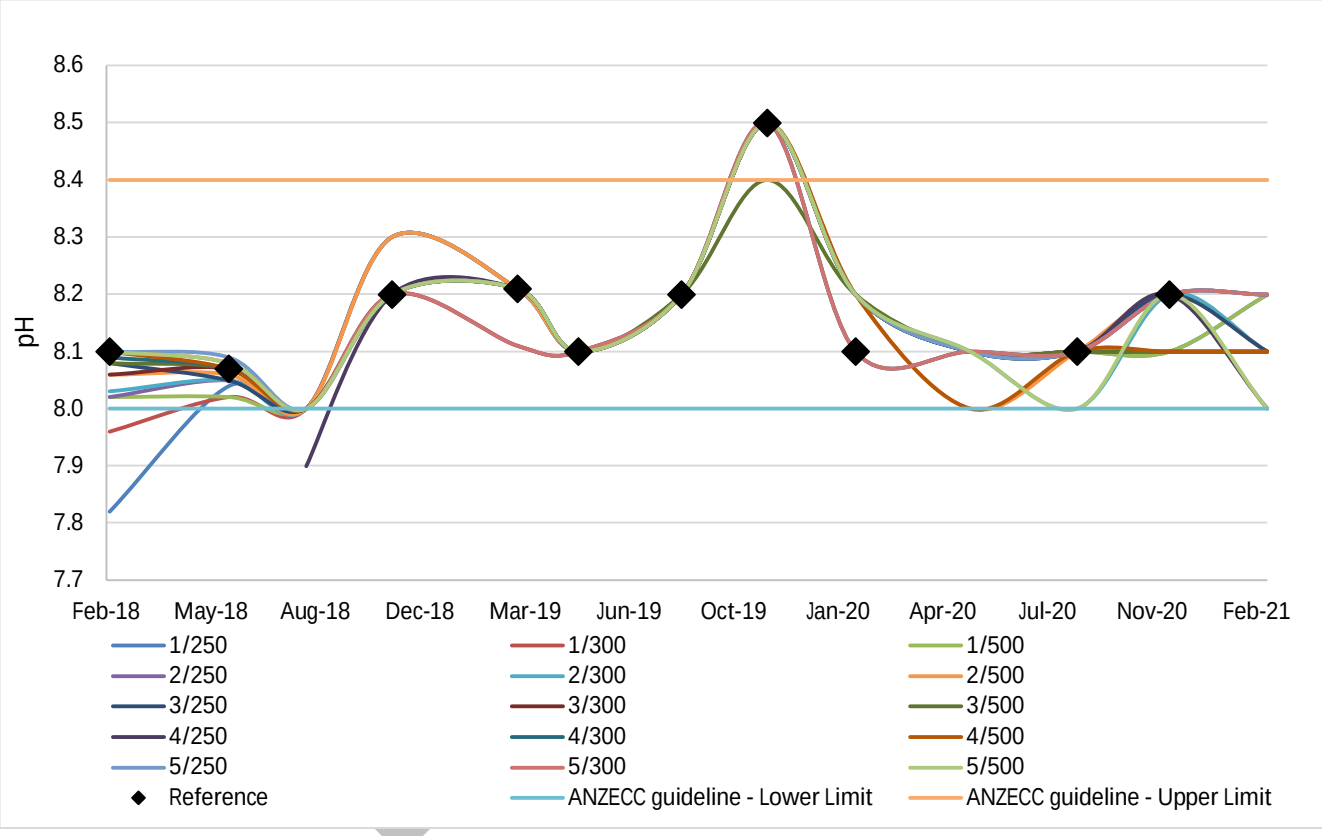

Figure 44 Quarterly pH monitoring during monitoring period

Generally, the pH values comply with the ANZECC guidelines during the monitoring period however there are two sites on 15 February 2018 and one site on 22 August 2018 where the pH values were below the ANZECC guidelines – lower limit of 8. Furthermore, all pH values recorded on 06 November 2019 were equal to 8.5, similar to the pH recorded at the reference site.

Turbidity

The turbidity at monitoring locations since commissioning is shown in Figure 45. The first number represents the site number and the second number the distance from the centre of the diffuser. The reference value has been taken 1000m from the diffuser.

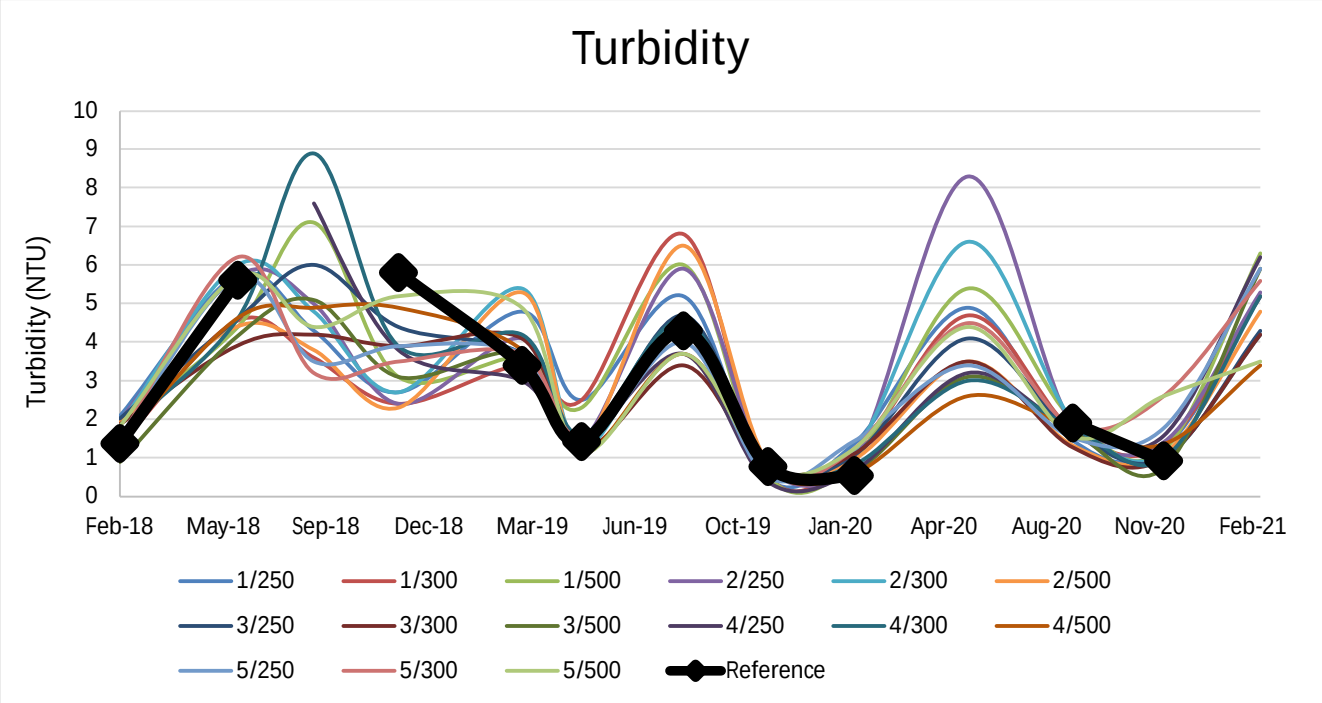

Figure 45 Quarterly turbidity monitoring during monitoring period

Temperature

Measured seawater temperature at monitoring locations and the reference location since commissioning are shown in Figure 46. The first number represents the site number and the second number the distance from the centre of the diffuser. The reference location is 1000m from the diffuser.

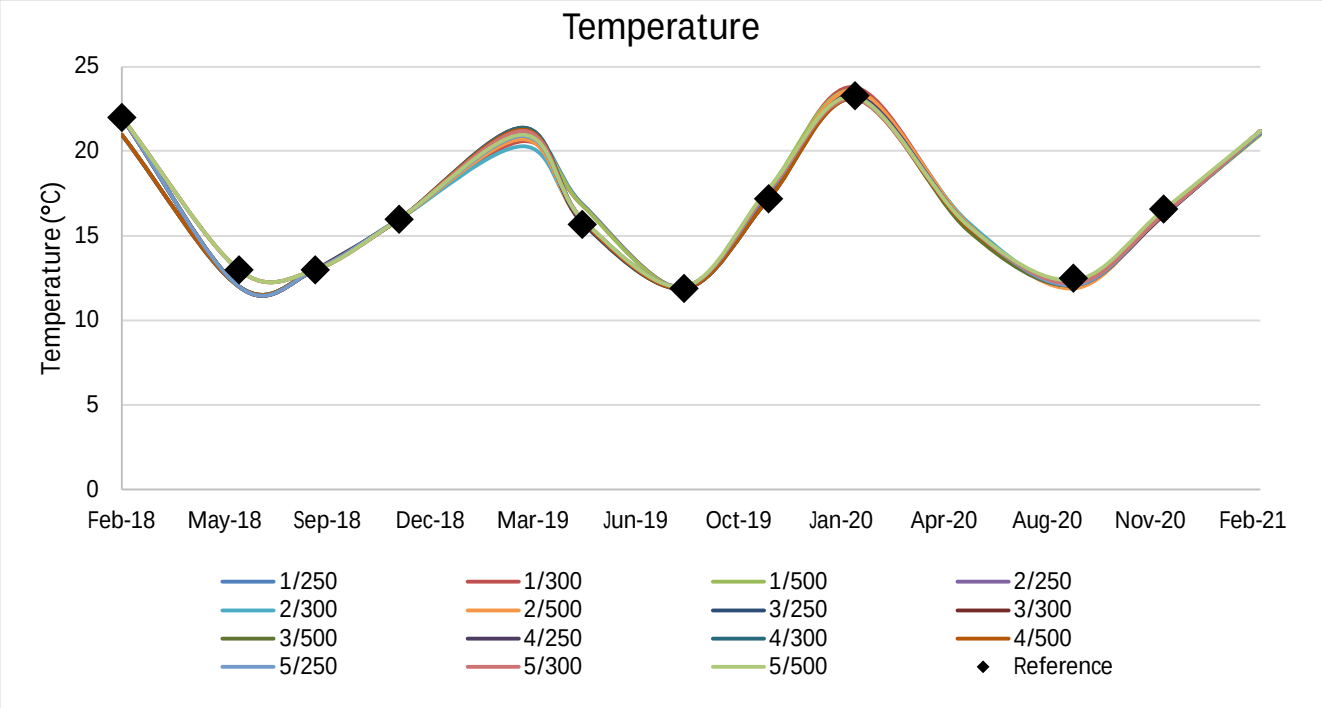

Figure 46 Quarterly temperature monitoring during monitoring period

Dissolved Oxygen

The concentration of dissolved oxygen, expressed as a percentage of the saturation level, at monitoring locations since commissioning is shown in Figure 47. The first number represents the site number and the second number the distance from the centre of the diffuser. The reference value has been taken 1000m from the diffuser.

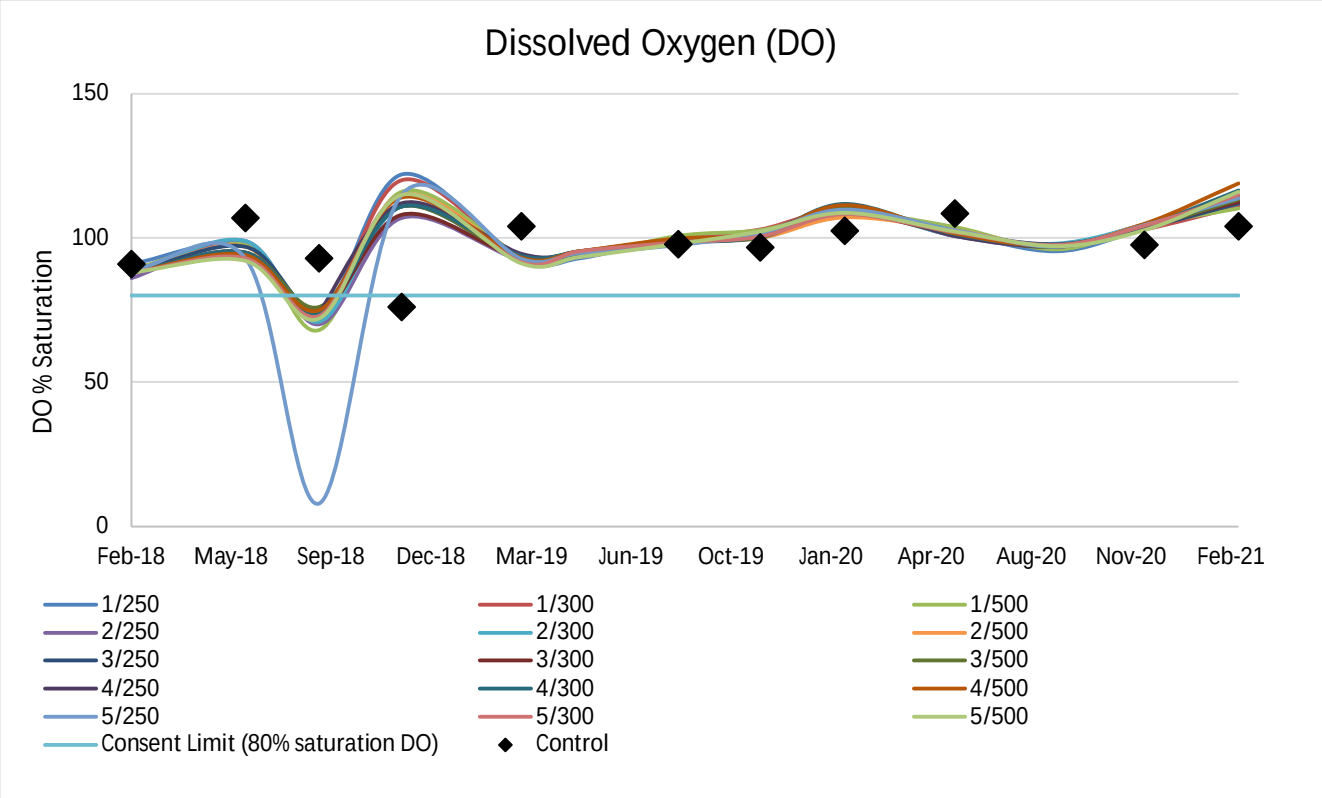

Figure 47 Quarterly dissolved oxygen monitoring during monitoring period

5.22.4 Compliance

Faecal coliforms: Complies

Enterococci: Exceeds maximum ANZECC guideline trigger values for marine environments – no consented limits rather only requirement to measure

pH: At some sites during the monitoring period, pH values outside the ANZECC guideline trigger values were recorded

Turbidity: Complies

Temperature: Complies

Dissolved oxygen: DO saturation levels recorded on 22 August 2018 was lower than the consent limit.

NCC will continue to monitor microbial concentrations as per the condition of the consent noting that repairs to the leaks in the pipeline have been undertaken.

5.23 Condition 25 – GPS Drogue

5.23.1 Condition

While samples are being taken in accordance with condition 24, a GPS drogue shall be placed at the centre of the diffuser to measure the surface currents for at least 30 minutes.

5.23.2 Source of Data

Data has been provided by Napier City Council in annual and compliance reports for the reporting periods 2018/2019 and 2019/2020 including details of the use of a GPS drogue, and drogue tracks for the last three years.

5.23.3 Analysis of Data

During the reporting period 2018/2019, for each quarterly sample, a GPS drogue was placed at the diffuser centre for approximately 2 hours in order to track the prevailing surface wind/water interaction. The drogue could not be deployed due to health and safety issues during the August 2018 sampling round, as New Zealand Dive & Salvage was present on site with both boats and divers in the water at this time. It is also noted that the compiled tracking data for the three sampling rounds where the drogue was deployed shows differing results each season. As wind can cause surface ripples in line with wind direction, it is difficult to discern with each sampling event whether the drogue was affected by prevailing littoral drift, the effect of Coriolis, or surface wind.

During the reporting period 2019/2020, for each quarterly sample, a GPS drogue was placed at the diffuser centre for approximately 2 hours in order to track the prevailing surface wind/water interaction. The compiled tracking data for the four sampling rounds where the drogue was deployed shows generally similar results for each deployment i.e. a Northward drift, however as noted above, it is difficult to discern with each sampling event whether the drogue was affected by prevailing littoral drift, the effect of Coriolis, or surface wind.

Overall, NCC noted that a GPS drogue is deployed on each sampling section.

5.23.4 Compliance

Complies.

A GPS drogue has been used as required by condition 25.

5.24 Condition 26 – Benthic Fauna

5.24.1 Condition

RCCP conditions for this condition have been paraphrased below. The full RCCP conditions can be found in Appendix A of this report.

Undertake surveys designed to show the impact of discharge on benthic fauna, between late December and late February (preferably in January) with the first survey undertaken within two years of the upgrade, and every five years after. The first survey shall include an analysis of trace metal concentrations in flatfish.

5.24.2 Source of Data

- The annual environmental reports for periods 2018/2019 and 2019/2020
- Napier City Council wastewater discharge monitoring: 2021 benthic survey and effects assessment prepared by NIWA

5.24.3 Analysis of Data

The first survey was undertaken in 2016, two years after commissioning of the upgrade. This survey included an analysis of trace metal concentrations in flatfish as required by condition 25.

In January 2021, another survey was undertaken by NIWA which provided an assessment of benthic macrofaunal communities and sediments present at 18 stations located at varying distances from the outfall (50 – 2500 meters). This survey has included statistical analyses to determine how the benthic habitats and communities have changed over time, incorporating results from prior surveys.

5.24.4 Compliance

Complies.

The survey has been completed as required.

5.25 Condition 27 – Microbial Risk Assessment

5.25.1 Condition

RCCP conditions for this condition have been paraphrased below. The full RCCP conditions can be found in Appendix A of this report.

Undertake a quantitative microbial risk assessment (QMRA) of the risk to shellfish growing Town Reef from pathogens occurring as a result of the discharge within the first 2 years since commissioning.

5.25.2 Source of Data

- EIA Ltd provided a report to Napier Council in March 2017, titles “Awatoto Coastal Sewage Outfall Resource Consent CD 090514W, Condition 26 – Trace Metal Concentrations in Flounder”
- Review of microbial contaminant data associated with Napier wastewater outfall prepared by NIWA.
- Assessment of the requirement to repeat Napier wastewater discharge risk assessment
- Response to review comments on NIWA report “Review of microbial data associated with Napier wastewater outfall” letter by NIWA

5.25.3 Analysis of Data

NCC commissioned NIWA to undertake the QMRA which was undertaken in 2016 (within the first two years since commissioning of the BTF as required). Since this report NCC have undertaken additional shellfish monitoring and requested advice from NIWA as to the appropriateness of an additional QMRA.

In August 2018 NCC discovered that the outfall pipe was leaking about 700 m from the shoreline. In response, NCC undertook a series of investigations to confirm the location and approximate size of the leak, the effect on near-scale microbiological water quality, and to determine far-field impacts. The latter included shoreline water quality monitoring using Faecal Indicator and deployment of caged mussels. The mussels were assayed to determine the concentration of Faecal Indicator Bacteria and genotypes of norovirus (GI and GII).

Separately HBRC reviewed the finding of the NCC investigations and notified NCC that advice be sought regarding the requirement to repeat the QMRA. NIWA was contracted to review available data and information and provide the required advice. Having established that the wastewater characteristics (discharge rate, concentration of microbial contaminants) were essentially unchanged since earlier QMRA studies, NIWA concluded that there was no reason to repeat the QMRA study, however a few recommendations were made, including analysing several sets of shoreline shellfish samples, to better understand the range of concentrations that may occur at sites along the coast.

5.25.4 Compliance

Complies.

5.26 Condition 28 – Effluent Quality Analysis

5.26.1 Condition

'All effluent quality analysis other than field measurements as required by the conditions of this consent shall be undertaken by an independent laboratory accredited to IANZ.'

5.26.2 Analysis of Data

NCC confirmed that all analyses have been undertaken by Hill Laboratories with some samples (related to sampling of the leaks in the outfall) sent to Water Testing Hawkes Bay. Some samples relevant to toxicity were sent to Cawthron. All these laboratories are IANZ accredited.

5.26.3 Compliance

Complies.

5.27 Condition 38 – Quantitative Microbial Risk Assessment

5.27.1 Condition

Condition 38 was added to the Resource Consent after the 2019 review.

'The consent holder shall obtain expert advice from a suitably qualified and experienced coastal scientist/modeller on the benefits of repeating the quantitative microbial risk assessment (QMRA). Advice shall be sought on (but not limited to) the following:

i) The findings of the most recent shellfish monitoring programme.

ii) Whether this or other updated modelling information is available that would alter the conclusions of the original QMRA.

iii) Whether repeating the QMRA based on all available and up to date information/data will provide a more accurate risk assessment, and a timeframe by which QMRA modelling could be updated and undertaken if required.

iv) The need for additional shellfish monitoring to inform the QMRA.

A copy of this written advice shall be provided to the Council (Manger Compliance) within 10 working days of its receipt by the consent holder, and no later than 31 December 2019.'

5.27.2 Analysis of Data

The National Institute of Water and Atmosphere (NIWA) issued a report to NCC in April 2020 which reviewed the microbial contaminant data associated with the Napier wastewater outfall to determine whether a repeat of the Quantitative Microbial Risk Assessment (QMRA) was required. A recommendation of the April 2020 assessment was that there was no requirement to repeat the QMRA immediately if agreed that the additional risk (if any) was tolerable and within the uncertainty of the modelling. A further report issued by NIWA in August 2020 assessed the requirements to repeat the Napier wastewater discharge risk assessment which again recommended that there was no requirement to repeat the QMRA immediately if agreed that the additional risk (if any) was tolerable and within the uncertainty of the modelling. However, NIWA also recommended that several other options could be explored to provide additional information should a QMRA be undertaken in the future, including collection of data that could be used to directly assess the risk to consumers of shellfish (demonstrated to be at greater risk than recreational water users by the 2016 QMRA results).

As per condition 38, written advice relating to whether a repeat of the QMRA was required was to be issued to Hawkes Bay Regional Council no later than 31 December 2019. However, as noted by NCC in the advice letter submitted in June 2020, several confounding factors lead to the delay in issuing the advice letter. These factors included:

- On 01 October 2019, NCC received confirmation that Hawkes Bay Regional Council had reviewed and amended/added some resource consent conditions.
- NCC received confirmation of the amended conditions on 05 November 2019 and subsequently engaged NIWA to review the QMRA by 31 December 2019.
- As reported by NCC, NIWAs workload was beyond capacity at that stage and could only provide a final report to NCC by June 2020.
- NIWA concluded that there is little justification to revise the model or create a new one, and in any new model, very similar levels of risk at shoreline exposure sites would be obtained.
- NCC issued the advice letter to Hawkes Bay Regional Council in June 2020 in order to fulfil the obligations of condition 38 of the resource consent and requesting clarification that the newly instigated conditions 38, 39 and 40 of the reviewed resource consent (AUTH-118503-02) are now no longer applicable.

5.28 Condition 39

5.28.1 Condition

Condition 39 was added to the Resource Consent after the 2019 review.

'If the expert advice obtained in accordance with condition 38 indicates that updating and undertaking a revised QMRA will improve the understanding of the risk presented by wastewater derived viruses, the consent holder shall undertake a new QMRA of the risk to shellfish growing on Town Reef from pathogens occurring as a result of the consent holder's discharge, based on the most up to date data and information currently available. This shall be completed and provided to the Council (Manager Compliance) before 30 April 2020.'

5.28.2 Analysis of Data

As per condition 38 above, NIWA concluded that there is little justification to revise the model or create a new one, and in any new model, very similar levels of risk at shoreline exposure sites would be obtained. Further, NCC issued the advice letter to Hawkes Bay Regional Council in June 2020 in order to fulfil the obligations of condition 38 of the resource consent and requesting clarification that the newly instigated conditions 38, 39 and 40 of the reviewed resource consent (AUTH-118503-02) are now no longer applicable.

6 Public Consultation Feedback

Section to be completed post public consultation period

Table 11 Public engagement comments and responses

Issue Raised	NCC Response / Information

7 Recommendations

The Resource Consent Coastal Permit (RCCP) contains 37 conditions which describe requirements for effluent quality and environmental monitoring at the Napier Wastewater Treatment Plant (WWTP). The RCCP relates to major improvements at the WWTP which were commissioned in 2014 and include the addition of a biological trickling filter plant (BTF). This report represents the second independent triannual evaluation of the WWTP performance, and as a result presents a performance evaluation of the WWTP during the period between 2018 to 2021.

In summary, all conditions were complied with on a rolling average over the assessment period but there were isolated exceedances of the following analytes and operational conditions:

- $cBOD_5$ loading of the BTF
- Zinc
- Ammonia
- Total Suspended Solids
- Total Fat Oil and Grease

An emerging adverse trend towards the condition limits was apparent in a number of analytes and operational conditions. This trend will inhibit the capacity of the WWTP to accept additional loads in line with projected population and trade waste growth, sea level rise and climate change. It is recommended that a master planning exercise be performed to scrutinise all aspects of the existing process train with the intention of identifying potential operational inefficiencies or the need for supplementary processes.

The vulnerability of effluent compliance is also affected by the quality of the Awatoto trade waste effluent which bypasses the BTF. It is recommended the master planning investigate the benefits of diverting this influent to the BTF.

The capability of the Napier WWTP to comply with the operating conditions is in part reliant on the tradewaste customers complying with their discharge limitations. Enhancements to the treatment processes of offending businesses will reduce non-compliant instances for the discharge to Hawkes Bay.

Recommendations to NCC will be made following the public consultation and engagement process to incorporate public comments and responses.

APPENDIX A

Resource Consent Coastal Permit (RCCP)

Appendix A contents here

APPENDIX B

Public Consultation Materials

Appendix B contents here

ASIA PACIFIC OFFICES

BRISBANE
Level 2, 15 Astor Terrace
Spring Hill QLD 4000
Australia
T: +61 7 3858 4800
F: +61 7 3858 4801

CANBERRA
GPO 410
Canberra ACT 2600
Australia
T: +61 2 6287 0800
F: +61 2 9427 8200

DARWIN
Unit 5, 21 Parap Road
Parap NT 0820
Australia
T: +61 8 8998 0100
F: +61 8 9370 0101

GOLD COAST
Level 2, 194 Varsity Parade
Varsity Lakes QLD 4227
Australia
M: +61 438 763 516

MACKAY
21 River Street
Mackay QLD 4740
Australia
T: +61 7 3181 3300

MELBOURNE
Level 11, 176 Wellington Parade
East Melbourne VIC 3002
Australia
T: +61 3 9249 9400
F: +61 3 9249 9499

NEWCASTLE
10 Kings Road
New Lambton NSW 2305
Australia
T: +61 2 4037 3200
F: +61 2 4037 3201

NEWCASTLE CBD
Suite 2B, 125 Bull Street
Newcastle West NSW 2302
Australia
T: +61 2 4940 0442

PERTH
Ground Floor, 503 Murray Street
Perth WA 6000
Australia
T: +61 8 9422 5900
F: +61 8 9422 5901

SYDNEY
Tenancy 202 Submarine School
Sub Base Platypus
120 High Street
North Sydney NSW 2060
Australia
T: +61 2 9427 8100
F: +61 2 9427 8200

TOWNSVILLE
12 Cannan Street
South Townsville QLD 4810
Australia
T: +61 7 4722 8000
F: +61 7 4722 8001

WOLLONGONG
Level 1, The Central Building
UoW Innovation Campus
North Wollongong NSW 2500
Australia
T: +61 2 4249 1000

AUCKLAND
Level 4, 12 O'Connell Street
Auckland 1010
New Zealand
T: 0800 757 695

NELSON
6/A Cambridge Street
Richmond, Nelson 7020
New Zealand
T: +64 274 898 628