Christchurch City Council

Christchurch Wastewater Treatment Plant

Annual Monitoring Report

July 2015 - June 2016

CHRISTCHURCH WASTEWATER TREATMENT PLANT · SHUTTLE DRIVE OFF PAGES ROAD

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File: CRC051724 Annual Report For Ocean Outfall 2015-2016

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Summary

This report summarises the results of parameters monitored by the Christchurch Wastewater Treatment Plant (CWTP) over the period July 2015 – June 2016 in accordance with consent CRC051724. Consent CRC051724 allows the discharge of treated wastewater from the CWTP Oxidation Ponds into the Pegasus Bay Coastal Marine Area via an ocean outfall.

Of the comprehensive sampling programme required by the consents unfortunately the annual sampling under condition 13g appears to have been missed. Council are having samples taken and analysed ASAP to correct this error.

During the monitoring period most parameters achieved the required standards. There were small exceedances of bacteria limits in the 2016 winter.

CWTP's replacement outlet structure from the plant to Pond 1 was operational from late 2014.

Hydraulic gradient testing of the outfall was undertaken on 8 June 2016.

Christchurch Wastewater Treatment Plant Contents

Annual Monitoring Report

Jul 2015 – Jun 2016

1 Outfall Discharge

1.1 Resource Consent Conditions

Table 1.1.1 Pond Discharge Consent Compliance for Monitoring Period July 2015 – June 2016 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance												
			Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Overall
2	Discharge Content	Discharge is only wastewater from the CWTP ponds	J	J	J	J	J	J	J	J	J	J	J	J	J
3	Discharge Volume	Recorded	J	J	J	J	J	J	J	J	J	J	J	J	J
4	Discharge Rate	Recorded	J	J	J	J	J	J	J	J	J	J	J	J	J
9	Outfall Maintenance	Routine maintenance completed and recorded	J	J	J	J	J	J	J	J	J	J	J	J	J
10	Outfall Condition	Visual inspection of outfall	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	J
12	Pumping Pressure for a given flow	Monitored	J	J	J	J	J	J	J	J	J	J	J	J	J

Key: J Full Compliance K Minor, Isolated or Risk of Non-Compliance L Major or Consistent Non-Compliance

1.2 Comments on Resource Consent Conditions

The Ocean Outfall Pumping Station has operated within expected parameters and is comparable with last year's performance. The discharge flows and pressures were recorded as noted in the quarterly reports.

Visual inspection and cleaning of the outfall diffusers 6, 7, 8 & 9 was completed May 2016, and the report was forwarded to ECan.

Hydraulic gradient testing of the outfall was undertaken on 8 June 2016.

Figure 1.2.1 - Daily Outfall Flow Totals Jul 2015 – Jun 2016

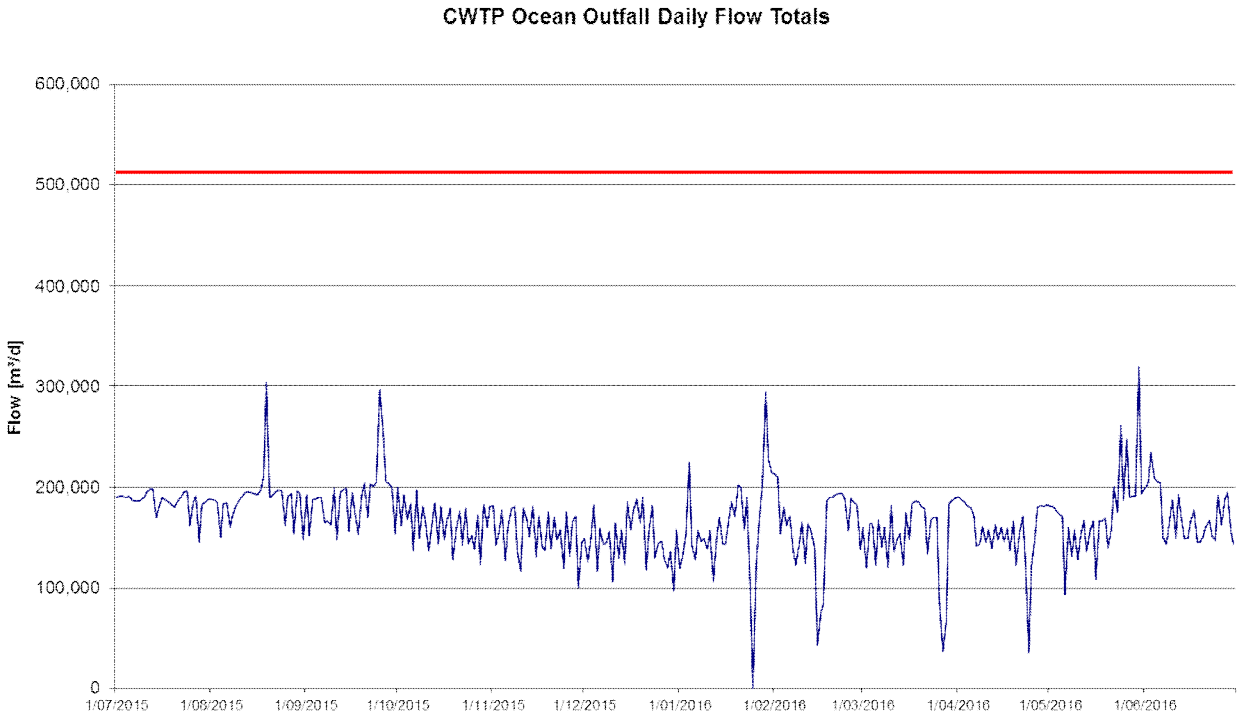
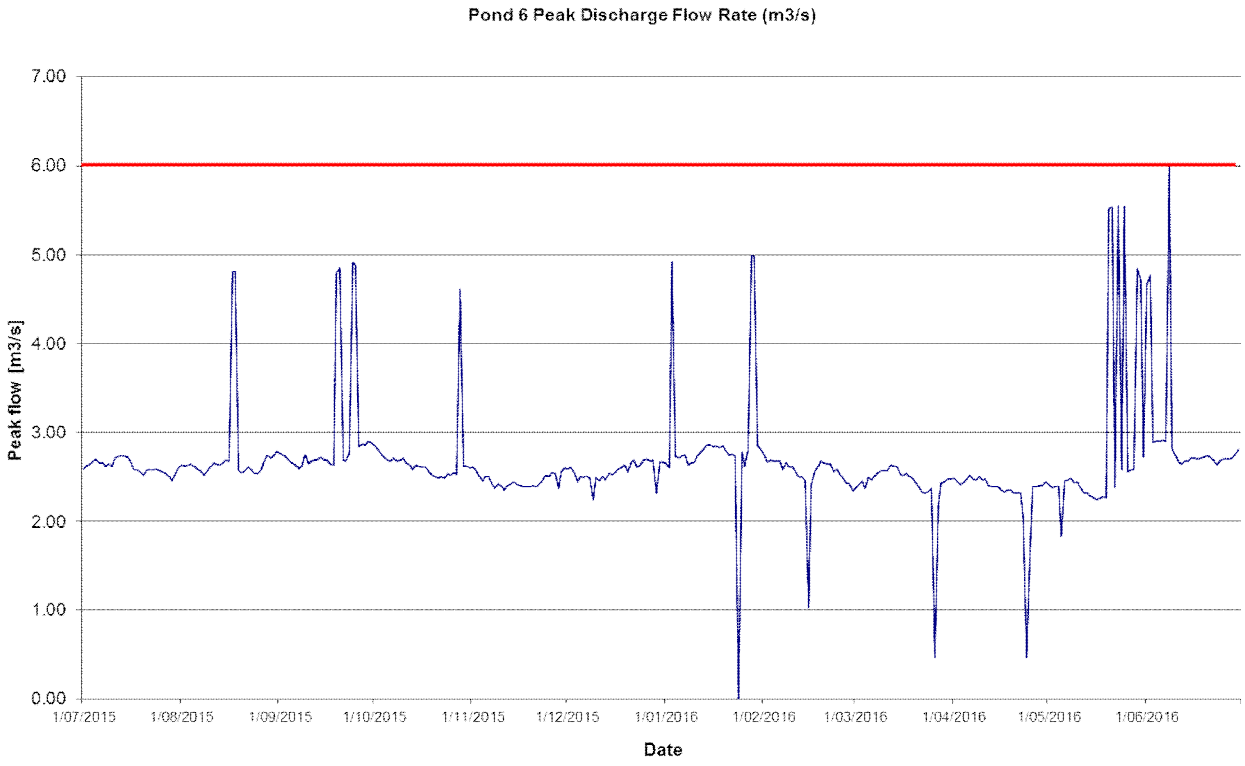


Figure 1.2.2 - Daily Peak Outfall Flows Jul 2015 - Jun 2016



1.3 Resource Consent Standard Conditions

Table 1.3.1 Contaminant Limits Consent Compliance Jul 2015 – Jun 2016 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance												
			Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Overall
15a	Dissolved BOD_5	Concentration does not exceed 20 g/m^3	J	J	J	J	J	J	J	J	J	J	J	J	J
	Total Suspended Solids	Concentration does not exceed 50 g/m^3	J	J	J	J	J	J	J	J	J	J	J	J	J
	Ammoniacal Nitrogen	Concentration does not exceed 40 g/m^3	J	J	J	J	J	J	J	J	J	J	J	J	J
16a	Faecal Coliforms	Concentration does not exceed 1,000(standard)/5,000(higher) MPN/100mL	J	J	J	J	J	J	J	J	K	J	K	J	K
	Enterococci	Concentration does not exceed 1,500 MPN/100mL	J	J	J	J	J	J	J	J	K	J	J	J	K

Key: J Compliance Achieved with no Exceedance of Standard K Compliance Achieved with Occasional Exceedance of Standard L Exceedance of Standard resulting in Non-Compliance

1.4 Comments on Resource Consent Standard Conditions

In general, the Ocean Outfall Pumping Station has operated within expected parameters and is an improvement on last year's performance.

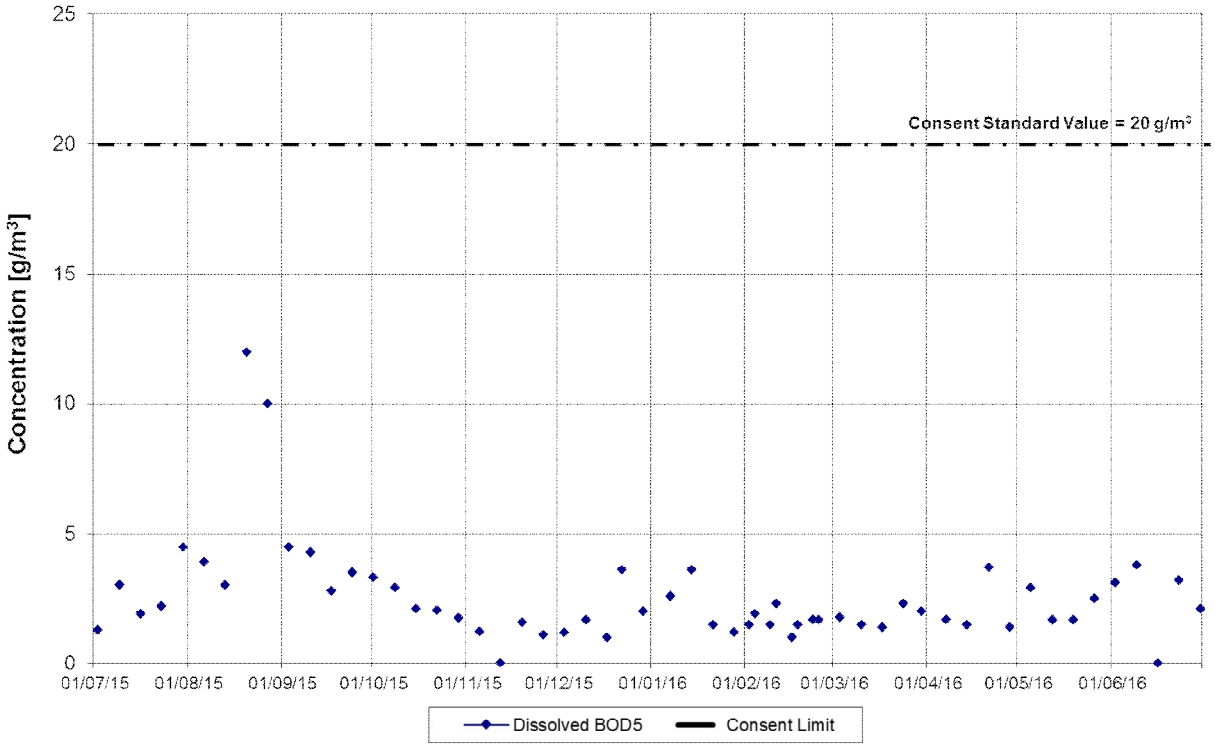
1.5 Dissolved BOD_5 Compliance

Table 1.5.1 Pond Discharge Dissolved BOD_5

Median Value [g/m^3] Current Monitoring Period (July 2015 - June 2016)	2	Number of Exceedances Current Monitoring Period (July 2015 - June 2016)	0
Median Value [g/m^3] Previous Monitoring Period (July 2014 - June 2015)	2.5	Number of Exceedances Previous Monitoring Period (July 2014 - June 2015)	0

There were no values exceeding the 20g/m^3 limit recorded for the current year. The median value for the current reporting period was lower than the previous period.

1.5.2 Pond Discharge Dissolved BOD_5



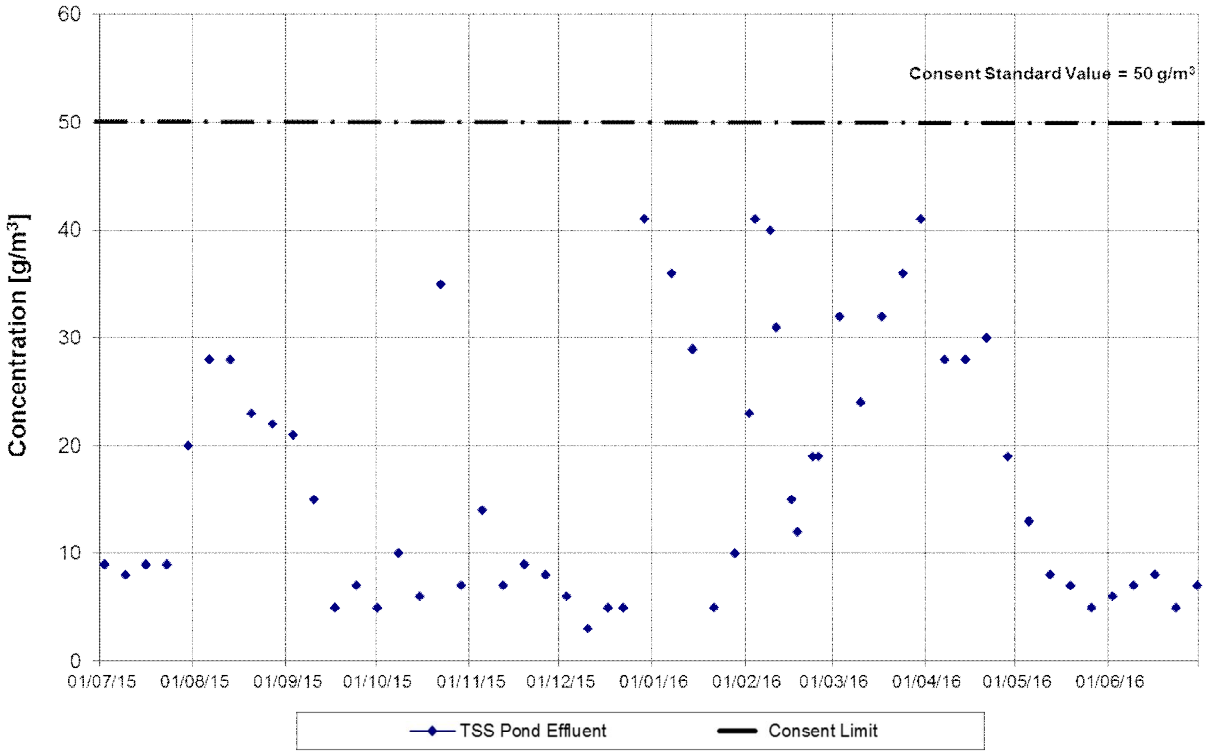
1.6 Total Suspended Solids Compliance

Table 1.6.1 Pond Discharge Total Suspended Solids

Median Value [g/m^3] Current Monitoring Period (July 2015 - June 2016)	13	Number of Exceedances Current Monitoring Period (July 2015 - June 2016)	0
Median Value [g/m^3] Previous Monitoring Period (July 2014 - June 2015)	18.5	Number of Exceedances Previous Monitoring Period (July 2014 - June 2015)	13

There were no values exceeding the 50g/m3 limit recorded for the current year. The median value for the current reporting period was lower than the previous period.

1.6.2 Pond Discharge Total Suspended Solids



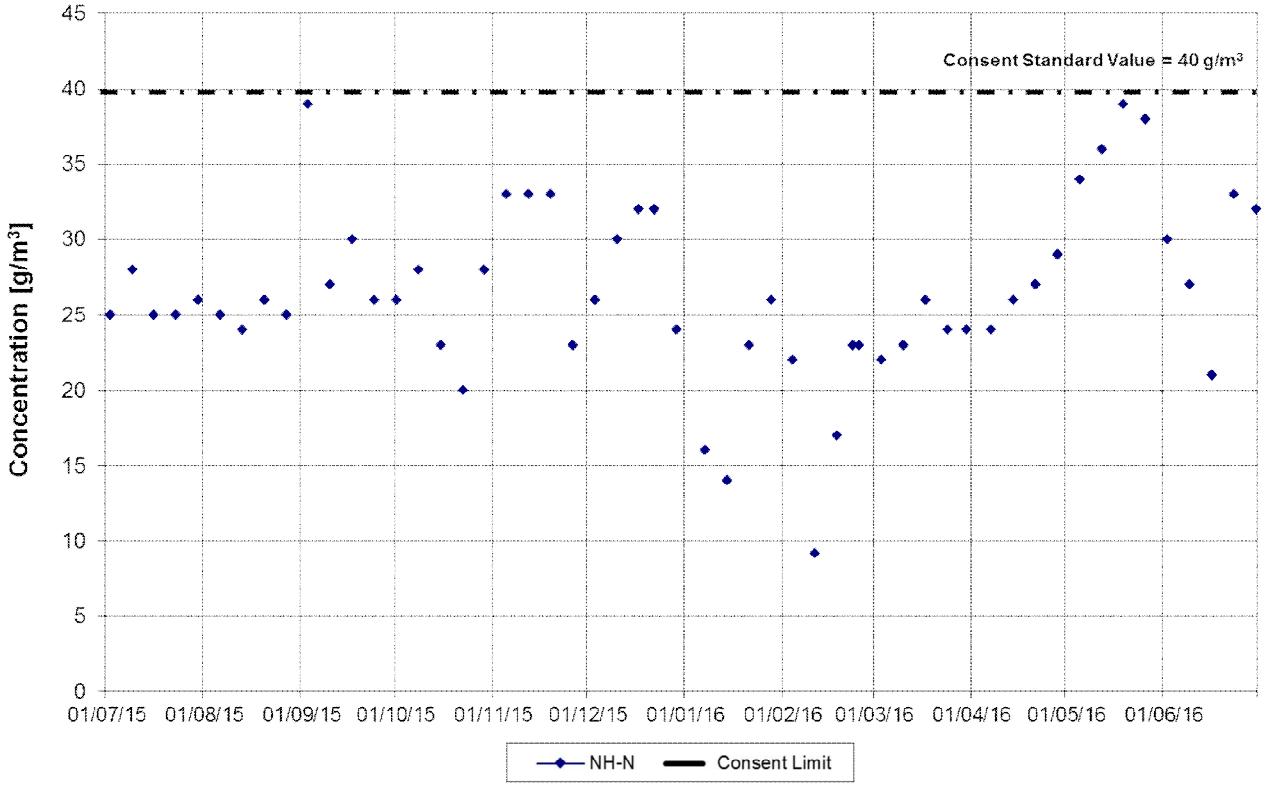
1.7 Ammonia Nitrogen Compliance

Table 1.7.1 Pond Discharge Ammoniacal Nitrogen

Median Value [g/m^3] Current Monitoring Period (July 2015 - June 2016)	26	Number of Exceedances Current Monitoring Period (July 2015 - June 2016)	0
Median Value [g/m^3] Previous Monitoring Period (July 2014 - June 2015)	22	Number of Exceedances Previous Monitoring Period (July 2014 - June 2015)	0

There were no exceedances recorded for current year. The median value for the current period was higher than the previous reporting period.

1.7.1 Pond Discharge Ammoniacal Nitrogen



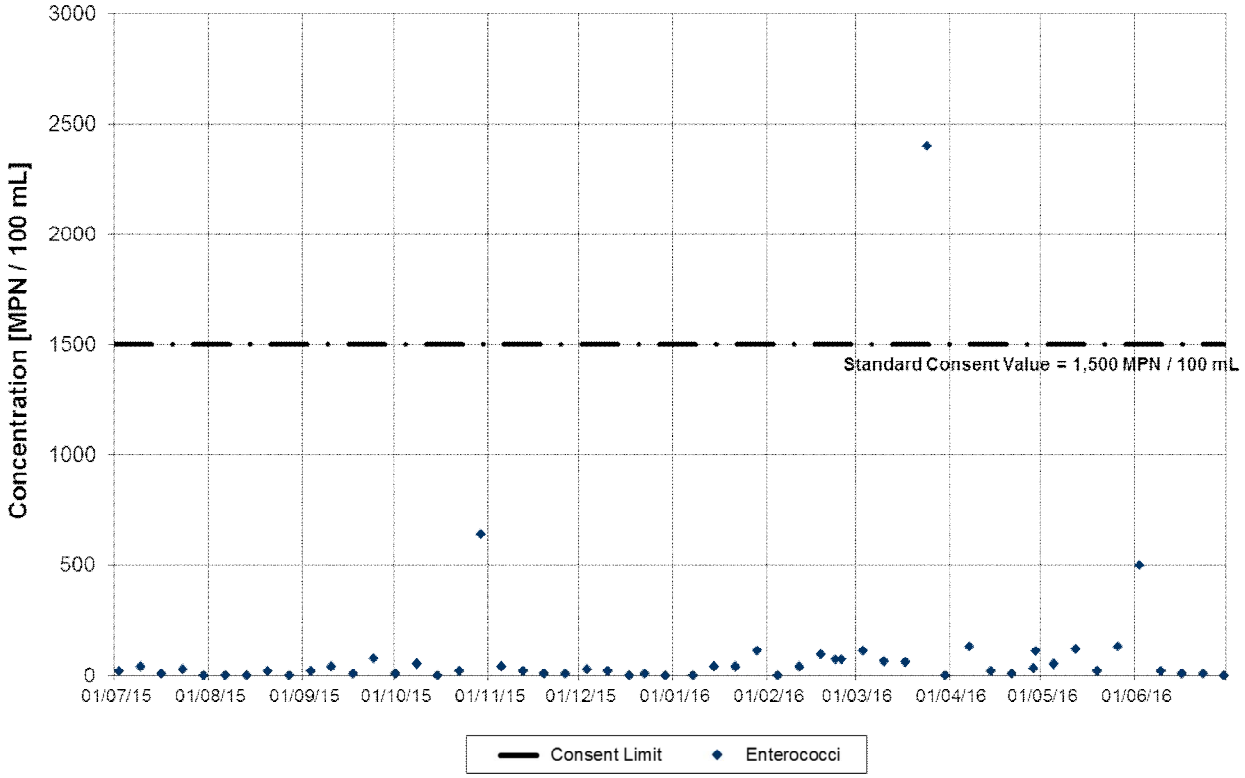
1.8 *Enterococci Monitoring*

Table 1.8.1 Pond Discharge Enterococci

Median Value [MPN/100ml] Current Monitoring Period (July 2015 - June 2016)	41	Number of Exceedances Current Monitoring Period (July 2015 - June 2016)	1
Median Value [MPN/100ml] Previous Monitoring Period (July 2014 - June 2015)	63	Number of Exceedances Previous Monitoring Period (July 2014 - June 2015)	3

There was one exceedance of the consented value in the current year. The median value was lower than the previous period.

1.8.1 Pond Discharge Enterococci



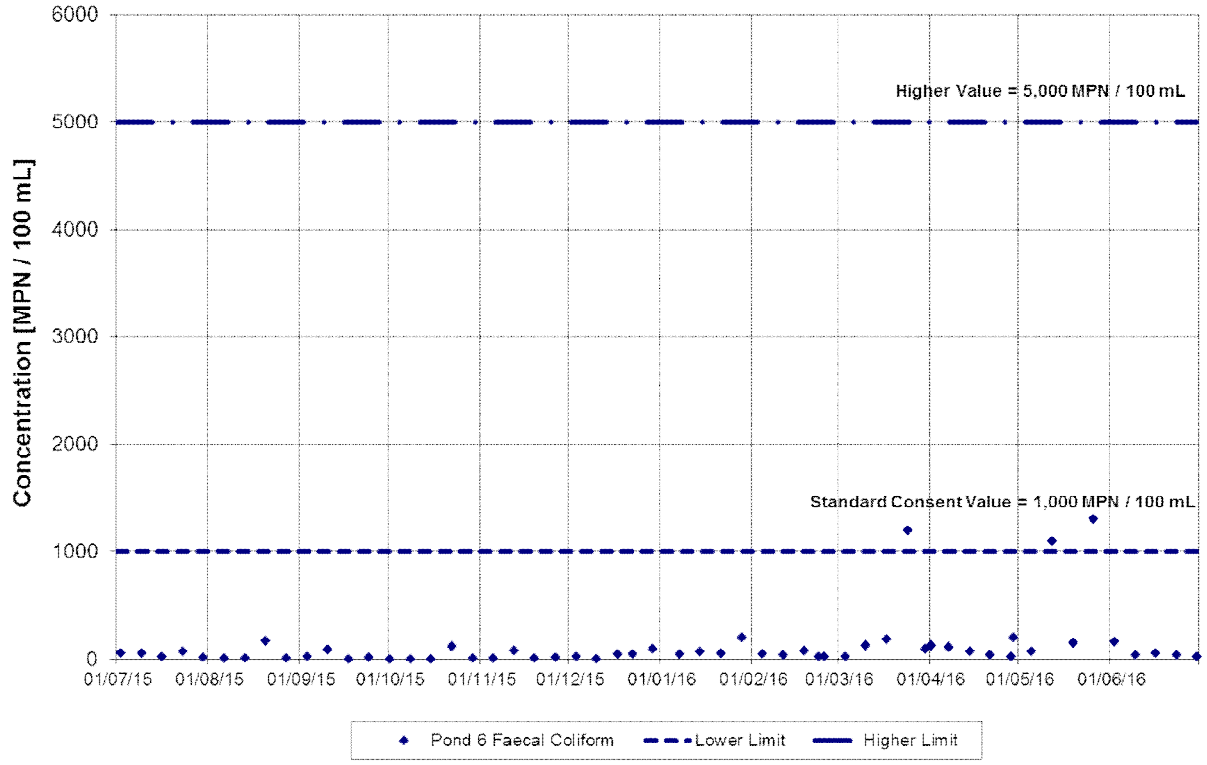
1.9 *Faecal Coliform Compliance*

Table 1.9.1 Pond Discharge Faecal Coliforms

Median Value [MPN/100ml] Current Monitoring Period (July 2015 - June 2016)	60	Number of Exceedances of Lower Limit Current Monitoring Period (July 2015 - June 2016)	3
Median Value [MPN/100ml] Previous Monitoring Period (July 2014 - June 2015)	120	Number of Exceedances of Lower Limit Previous Monitoring Period (July 2014 - June 2015)	3

There were three sample results above the standard consent limit. The median for this year is lower than the previous period.

1.9.1 Pond Discharge Faecal Coliforms



1.10 Other Pathogenic, and Other Contaminants

Condition 13e

Giardia cysts, cryptosporidium, salmonella, enterovirus, adenovirus and campylobacter levels have been measured and reported in April 2016.

Condition 13f

Heavy metals (copper, chromium, nickel, zinc, cadmium, lead, arsenic, and mercury) were measured and reported July 2013, December 2014, April 2015 and January 2016.

Condition 13g

Unfortunately this sampling was missed and was not picked up until this annual report. This sampling will be undertaken ASAP to address this mistake. Organochlorine pesticides, organophosphate pesticides, PCBs, and polycyclic aromatic hydrocarbons were last analysed in November 2014 and reported in the February 2015 quarterly report.

Condition 17

No scums, foams or other floatable material was observed at the edge of the diffuser mixing zone during the May 2016 survey.

2 Receiving Environment Monitoring in Pegasus Bay

2.1 *Water Quality Resource Consent Conditions*

Table 2.1.1 Receiving Environment Water Quality Consent Compliance July 2015 – June 2016

Consent Condition	Parameter	Compliance Condition	Compliance				
			Jul - Oct 15	Nov –Jan 16	Feb – Apr 16	May - Jun 16	Overall
18	Faecal Coliforms	Sampled and Analysed	J	J	J	J	J
	Enterococci	Sampled and Analysed	J	J	J	J	J
22a[1]	Temperature	Two yearly	n/a	n/a	n/a	n/a	n/a
	DO	Two yearly	n/a	n/a	n/a	n/a	n/a
	Salinity	Two yearly	n/a	n/a	n/a	n/a	n/a
	Total Suspended Solids	Two yearly	n/a	n/a	n/a	n/a	n/a
	Nitrogen Oxides	Two yearly	n/a	n/a	n/a	n/a	n/a
	Ammoniacal Nitrogen	Two yearly	n/a	n/a	n/a	n/a	n/a
	Dissolved Reactive Phosphorus	Two yearly	n/a	n/a	n/a	n/a	n/a
	Chlorophyll-a	Two yearly	n/a	n/a	n/a	n/a	n/a
	Trace Metals (arsenic, cadmium, copper, chromium, lead, nickel and zinc)	Two yearly	n/a	n/a	n/a	n/a	n/a
	Faecal Coliforms	Two yearly	n/a	n/a	n/a	n/a	n/a
	Enterococci	Two yearly	n/a	n/a	n/a	n/a	n/a
	Phytoplankton Species	Two yearly	n/a	n/a	n/a	n/a	n/a

Key: J Full Compliance K Minor, Isolated or Risk of Non-Compliance L Major or Consistent Non-Compliance

[1] Sampling is scheduled for 2013.

2.2 *Comments on Compliance*

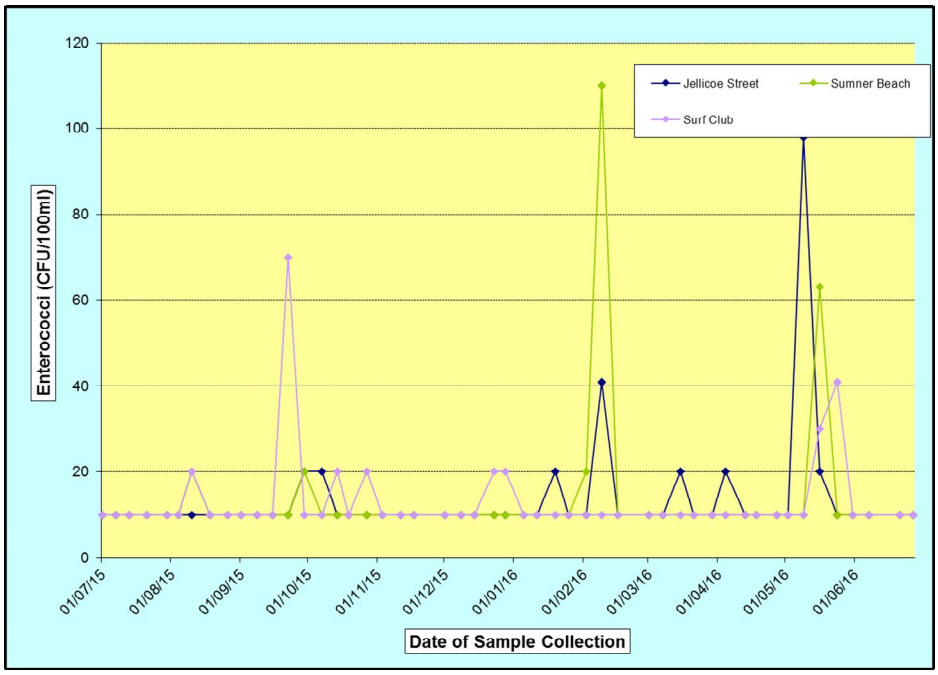
Most results for the Pegasus Bay area were within consent for 2015-16. Any tests that failed initial sampling passed on their 24hr delayed sample.

Testing for condition 22a was done February 2015 and reported to ECan.

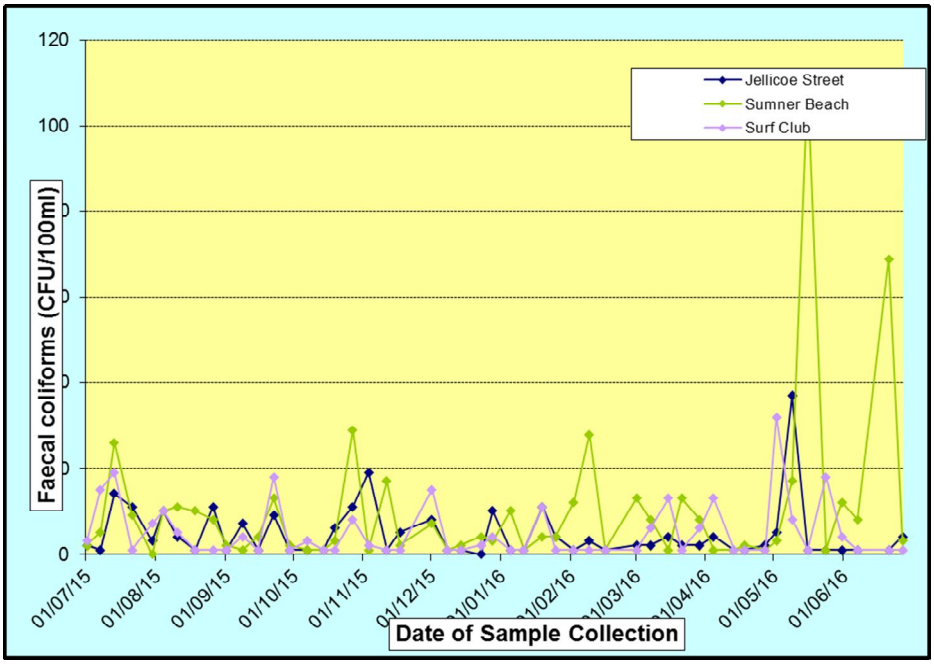
2.3 *Beach Water Quality Analysis Results*

Samples for condition 18 were taken at weekly intervals from the prescribed onshore locations. The results are presented in Figures 2.3.1and 2.3.2. Retest results are contained in the appendices.

2.3.1 Enterococci Levels at beaches adjacent to the Outfall



2.3.2 Faecal Coliform Levels at beaches adjacent to the Outfall



2.4 Other Receiving Environment Analysis

Consent conditions 23, 25, 26 and 27 call for monitoring of the marine environment around the outfall at various frequencies and were identified in the AEE. These requirements are summarised in Table 2.4.1. The results are attached to the quarterly reports covering the same period.

Table 2.4.1 Receiving Environment Monitoring Consent Compliance Jul 2015 - Jun 2016

Consent Condition	Parameter	Frequency	Compliance Condition	Compliance				
				Jul - Oct 15	Nov –Jan 16	Feb – Apr 16	May - Jun 16	Overall
23	Marine Sediments	5-yearly	Reported	n/a	n/a	n/a	n/a	n/a
25	Benthic Invertebrates	5-yearly	Reported	n/a	n/a	n/a	n/a	n/a
26	Epibenthic Fauna	5-yearly	Reported	n/a	n/a	n/a	n/a	n/a
27	Shellfish/Tuatua	Quarterly	Sampled and Analysed	J	J	J	J	J
29	Complaints	As required	Recorded and Reported	J	J	J	J	J
31	Report	Annually	Report and information lodged with ECan	J	n/a	n/a	n/a	J
32	Report	Quarterly	Report and information lodged with ECan	J	J	J	J	J
34	Management Plan	4 Years post commissioning	Report and information lodged with ECan – done March 2012 - 12/140121	n/a	n/a	n/a	n/a	n/a
36	Community Liaison Group	Annually	Recorded and Reported	n/a	J	n/a	n/a	n/a

Key: J Full Compliance K Minor, Isolated or Risk of Non-Compliance L Major or Consistent Non-Compliance

2.5 Comments on Other Receiving Environment

Conditions 23 - 26

Sediment, benthic and epibenthic testing is due in February/March 2017.

Condition 27

Shellfish were sampled and analysed.

Condition 29

There were no complaints from the public regarding the ocean outfall during the reporting period.

Condition 31 and 32

Annual and quarterly reports have been submitted to ECan.

Condition 36

The community liaison meeting was held 3/12/15 at CWTP (no attendees).