

**Christchurch
City Council**



Christchurch Wastewater Treatment Plant

Quarterly Monitoring Report

February – April 2015

CHRISTCHURCH WASTEWATER TREATMENT PLANT • SHUTTLE DRIVE OFF PAGES ROAD
PO BOX 73041 • CHRISTCHURCH • NEW ZEALAND • TEL 64-3-941-5701 • FAX 64-3-941-5729

File: Monitoring Report Feb - Apr 2015

Contact: Lee Liaw

Summary

This report summarises the results of parameters monitored by the Christchurch Wastewater Treatment Plant (CWTP) over the period February – April 2015 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.

A dry summer has caused a growth of algae in the oxidation ponds. This has adversely affected total suspended solids results.

Of the comprehensive sampling programme required by the consent, all samples were collected during the monitoring period and most monitored parameters achieved the required standards.

Christchurch Wastewater Treatment Plant Contents

Quarterly Monitoring Report

February to April 2015

1	OUTFALL DISCHARGE	4
1.1	<i>Resource Consent Conditions</i>	4
1.2	Comments on Compliance.....	4
1.3	<i>Resource Consent Standard Conditions</i>	6
1.4	<i>Comments on Compliance</i>	6
1.5	<i>Dissolved BOD₅ Compliance.....</i>	7
1.6	<i>Total Suspended Solids Compliance</i>	8
1.7	<i>Ammonia Nitrogen Compliance.....</i>	9
1.8	<i>Enterococci Monitoring</i>	10
1.9	<i>Faecal Coliform Compliance</i>	11
2	RECEIVING ENVIRONMENT MONITORING IN PEGASUS BAY	12
2.1	<i>Water Quality Resource Consent Conditions</i>	12
2.2	<i>Comments on Compliance</i>	12
2.3	<i>Beach Water Quality Analysis Results</i>	13
2.4	<i>Other Receiving Environment Analysis</i>	15
2.5	<i>Comments on Compliance</i>	15

1 Outfall Discharge

1.1 Resource Consent Conditions

Consent CRC051724 allows CWTP to discharge up to 518,000 cubic metres per day of treated wastewater from the CWTP Oxidation Ponds at a maximum rate of six cubic metres per second into the Pegasus Bay coastal marine area. Compliance conditions regarding the physical discharge to the estuary are summarised in Table 1.1.1. Daily records of maximum outfall discharge flow rates and volumes are attached as an appendix to this report, and shown in summary in Figures 1.2.1 and 1.2.2.

Table 1.1.1 Pond Discharge Consent Compliance for Monitoring Period February – April 2015 CRC051724

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

Flowrate and pressure data were recorded as per consent requirements.

A visual inspection and maintenance of the ocean outfall diffuser structure was performed 9th – 13th February 2015 by New Zealand Diving and Salvage. Biofouling was observed, but otherwise the diffuser appears to be in an operational condition. The report was emailed to ECan 02/03/15.

CWTP Ocean Outfall Daily Flow Totals

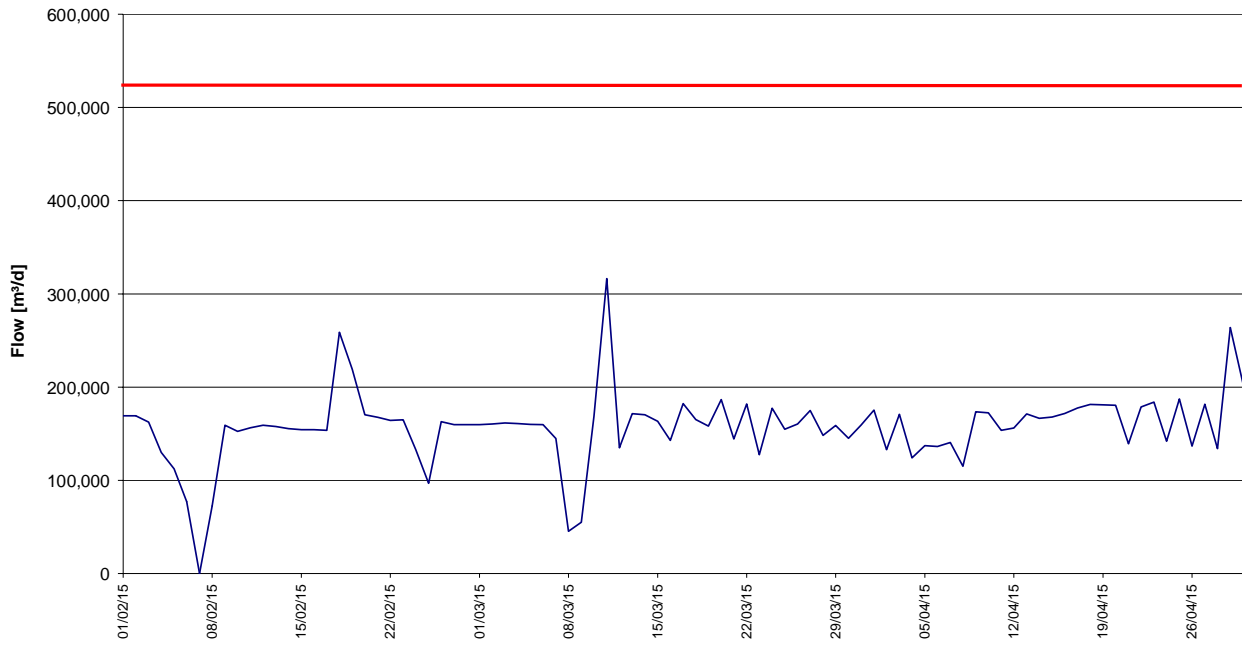


Figure 1.2.1 - Daily Outfall Flow Totals

CWTP Ocean Outfall Peak Discharge Flow Rate (m3/s)

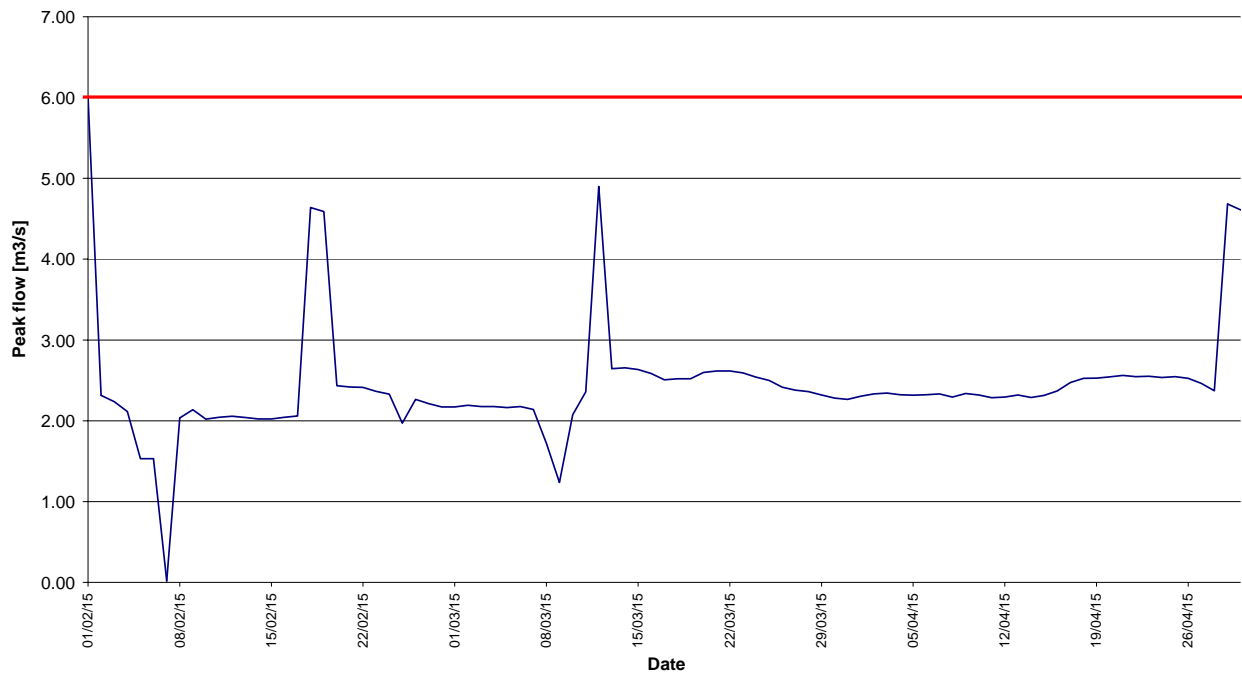


Figure 1.2.2 - Daily Peak Outfall Flows

1.3 Resource Consent Standard Conditions

Conditions 15 and 16 of consent CRC051724 set out concentration standards for a selection of parameters monitored in compliance with condition 13. No more than 16 samples in each rolling 26 week period should exceed the standard value for contaminants listed under condition 15a, and if more than seven from eight consecutive samples should exceed the standard value ECan must be notified within 48 hours. No more than six from eight consecutive samples should exceed the standard value for contaminants listed under condition 16a, and no more than two from eight consecutive samples should exceed the higher value. If more than seven from eight exceed the standard value, or three from eight exceed the higher value, ECan must be notified within 48 hours. Compliance conditions regarding adherence to these standard values are summarised in Table 1.3.1. Analysis results are supplied to Environment Canterbury at quarterly intervals. Contaminant monitoring results for consent CRC051724 are discussed further in Sections 1.4 – 1.9.

Table 1.3.1 Contaminant Limits Consent Compliance February – April 2015 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance			
			Feb 15	Mar 15	Apr 15	Overall
15a	Dissolved BOD ₅	Concentration does not exceed 20 g/m ³	J	J	J	J
	Total Suspended Solids	Concentration does not exceed 50 g/m ³	K	K	K	K
	Ammoniacal Nitrogen	Concentration does not exceed 40 g/m ³	J	J	J	J
16a	Faecal Coliforms	Concentration does not exceed 1,000(standard)/5,000(higher) MPN/100mL	K	J	J	K
	Enterococci	Concentration does not exceed 1,500 MPN/100mL	J	J	J	J

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 Compliance

All samples were collected and analysed. There were a number of exceedances for the TSS target due to algae growth; however CWTP still complied with Condition 15. There were two exceedances of the standard faecal coliform limit and a single exceedance of the upper limit in February.

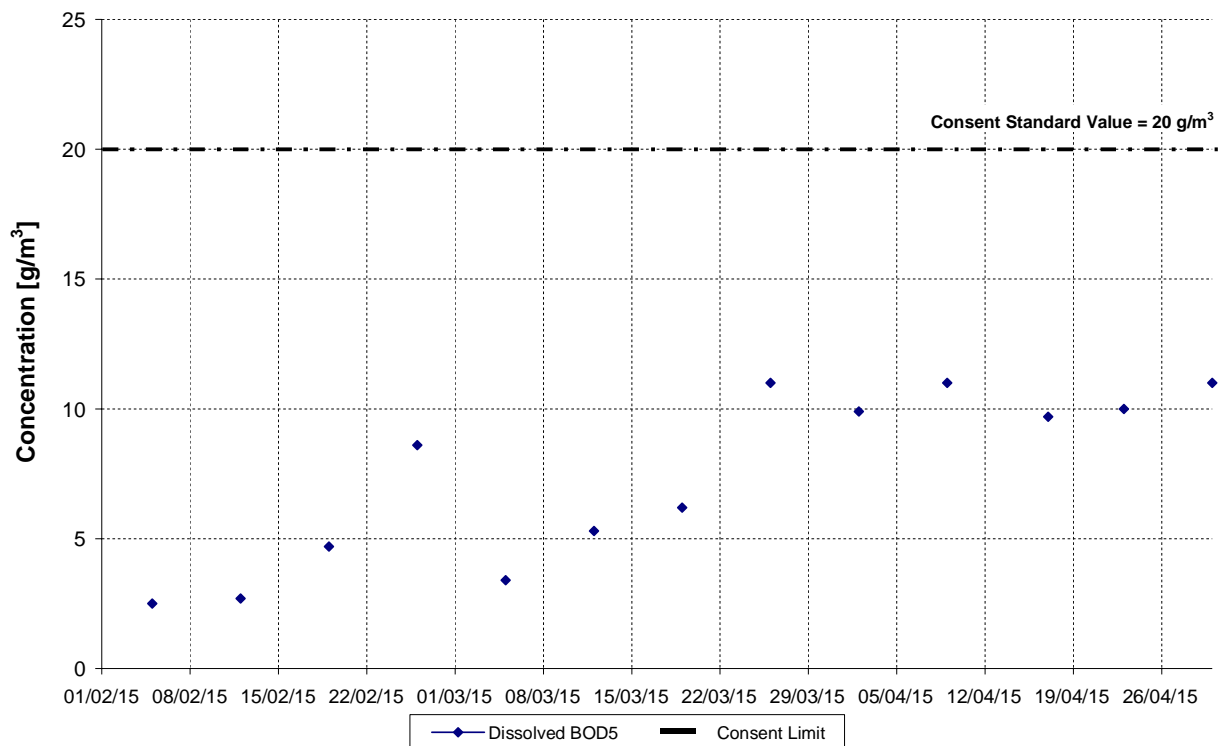
1.5 Dissolved BOD₅ Compliance

The median dissolved BOD₅ concentration for the period February – April 2015 was 8.6g/m³. This is higher than the median concentrations in the previous quarter and higher to the same quarter in 2013. There were no exceedances of the standard value (20.0 g/m³) in the current monitoring quarter.

Table 1.5.1 Pond Discharge Dissolved BOD₅

Median Value [g/m ³] Current Monitoring Quarter (Feb 2015 – Apr 2015)	8.6	Number of Exceedances Current Monitoring Quarter (Feb 2015 – Apr 2015)	0
Median Value [g/m ³] Previous Monitoring Quarter (Nov 2014 – Jan 2015)	3.8	Number of Exceedances Previous Monitoring Quarter (Nov 2014 – Jan 2015)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Feb 2014 – Apr 2014)	2.5	Number of Exceedances Same Monitoring Quarter of Previous Year (Feb 2014 – Apr 2014)	0

1.5.2 Pond Discharge Dissolved BOD₅



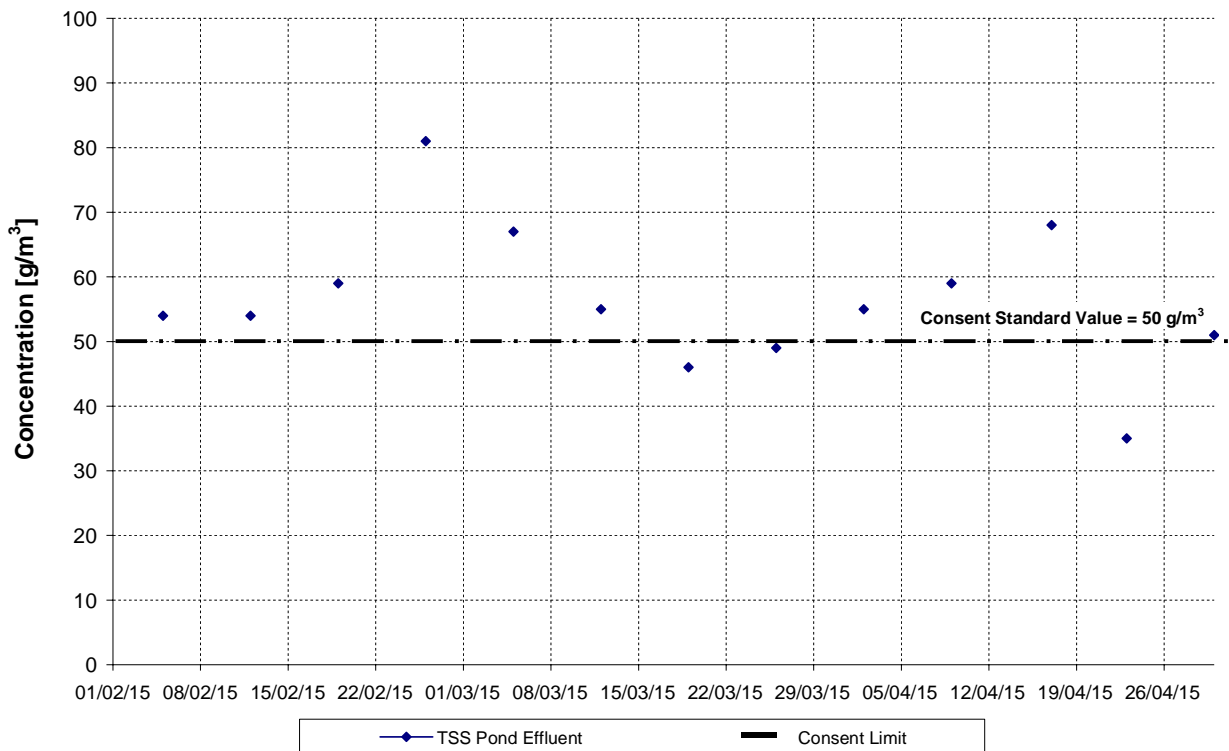
1.6 Total Suspended Solids Compliance

The median total suspended solids concentration for the period February – April 2015 was 55 g/m³. This is higher than the previous quarter and higher than the same quarter last year. There were 10 exceedances of the standard value (50 g/m³) this quarter due to an algae growth caused by the long dry summer. However CWTP still complied with Condition 15 ‘a’ and ‘b’.

Table 1.6.1 Pond Discharge Total Suspended Solids

Median Value [g/m ³] Current Monitoring Quarter (Feb 2015 – Apr 2015)	55	Number of Exceedances Current Monitoring Quarter (Feb 2015 – Apr 2015)	10
Median Value [g/m ³] Previous Monitoring Quarter (Nov 2014 – Jan 2015)	10	Number of Exceedances Previous Monitoring Quarter (Nov 2014 – Jan 2015)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Feb 2014 – Apr 2014)	21	Number of Exceedances Same Monitoring Quarter of Previous Year (Feb 2014 – Apr 2014)	0

1.6.2 Pond Discharge Total Suspended Solids



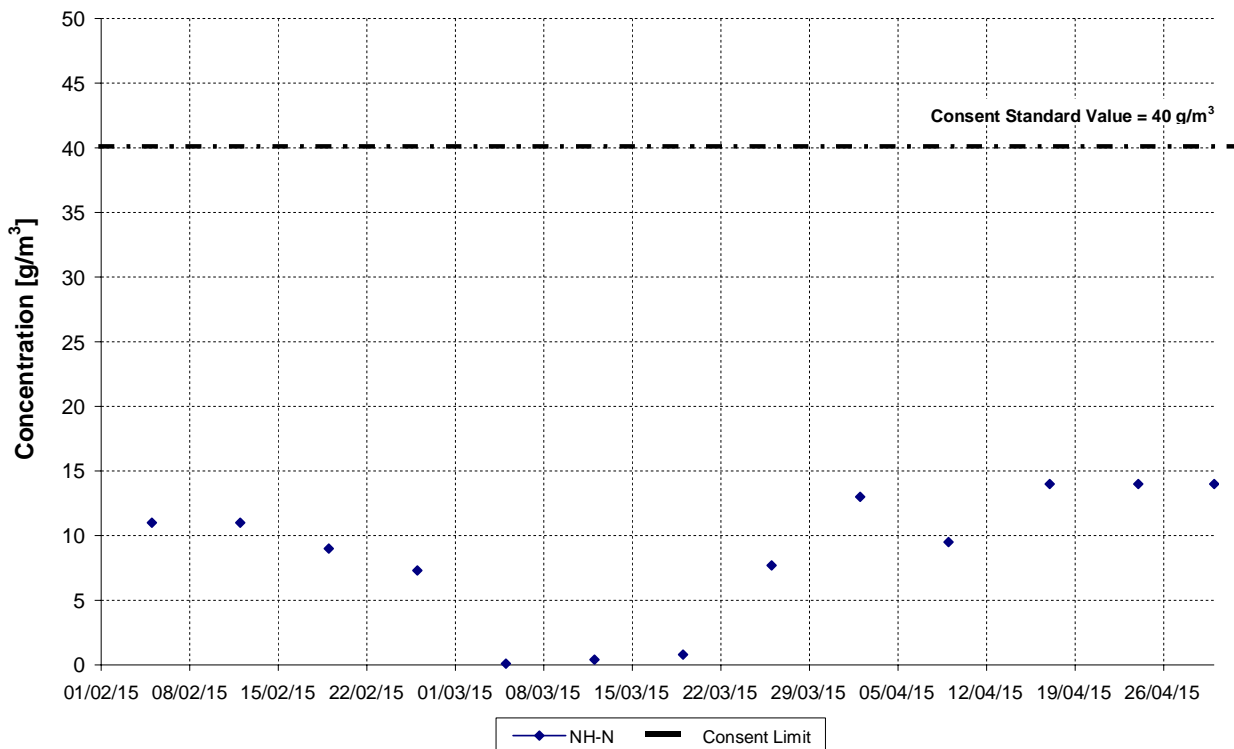
1.7 Ammonia Nitrogen Compliance

The median total ammonia nitrogen concentration for the period February – April 2015 was 9.5 g/m³. This was lower than the previous quarter and lower than the same quarter last year. There were no exceedances of the 40 g/m³ limit.

Table 1.7.1 Pond Discharge Ammoniacal Nitrogen

Median Value [g/m ³] Current Monitoring Quarter (Feb 2015 – Apr 2015)	9.5	Number of Exceedances Current Monitoring Quarter (Feb 2015 – Apr 2015)	0
Median Value [g/m ³] Previous Monitoring Quarter (Nov 2014 – Jan 2015)	25	Number of Exceedances Previous Monitoring Quarter (Nov 2014 – Jan 2015)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Feb 2014 – Apr 2014)	18	Number of Exceedances Same Monitoring Quarter of Previous Year (Feb 2014 – Apr 2014)	0

1.7.1 Pond Discharge Ammoniacal Nitrogen



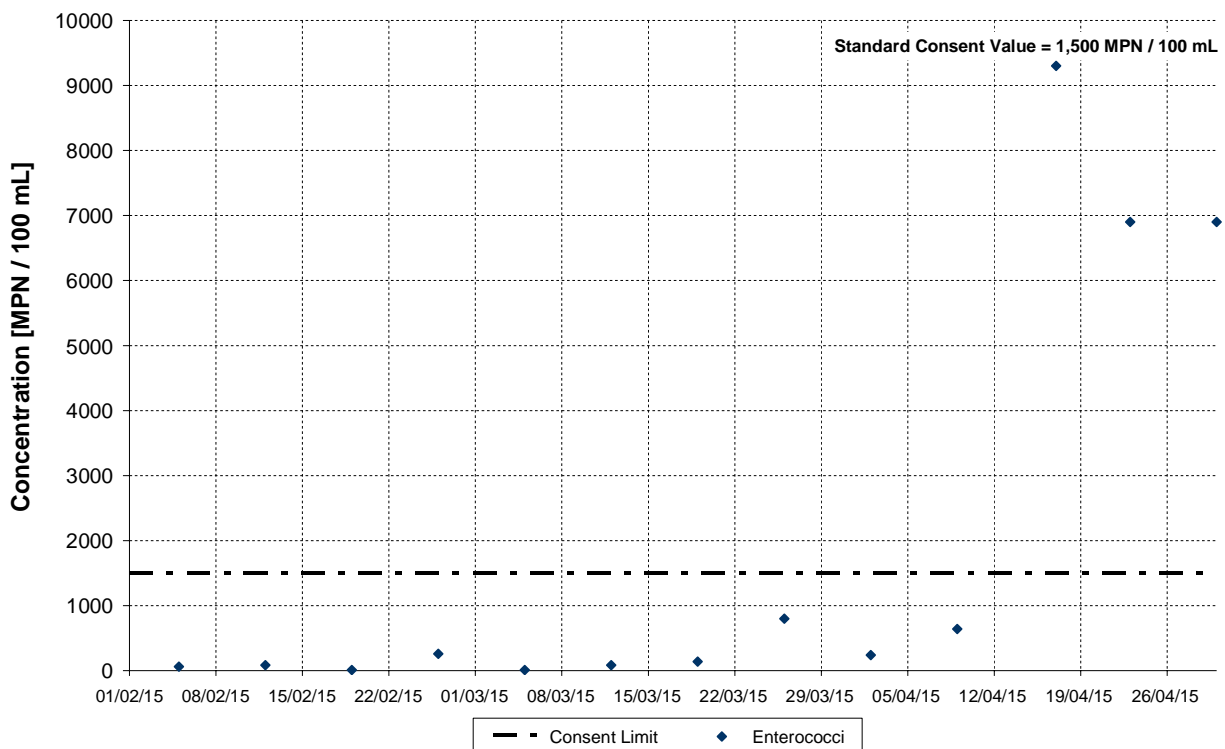
1.8 Enterococci Monitoring

The median enterococci concentration in the February – April 2015 reporting period was 240 MPN/100mL. This was higher than previous quarter and higher than the same quarter last year. There were three exceedances of the 1,500 MPN/100ml limit during the reporting quarter, and was due to a raise in the pond levels mid March.

Table 1.8.1 Pond Discharge Enterococci

Median Value [g/m ³] Current Monitoring Quarter (Feb 2015 – Apr 2015)	240	Number of Exceedances Current Monitoring Quarter (Feb 2015 – Apr 2015)	3
Median Value [g/m ³] Previous Monitoring Quarter (Nov 2014 – Jan 2015)	210	Number of Exceedances Previous Monitoring Quarter (Nov 2014 – Jan 2015)	2
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Feb 2014 – Apr 2014)	91	Number of Exceedances Same Monitoring Quarter of Previous Year (Feb 2014 – Apr 2014)	0

1.8.1 Pond Discharge Enterococci



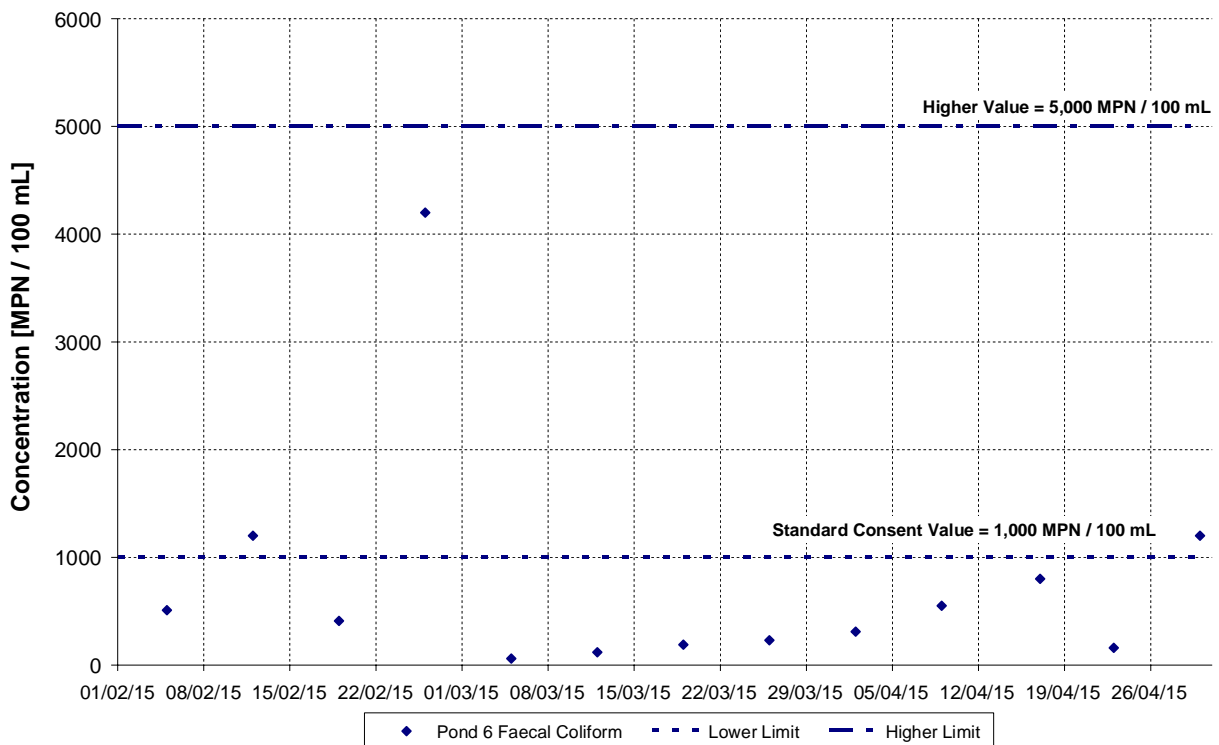
1.9 Faecal Coliform Compliance

The median concentration for the reporting period was 410 MPN/100 mL, which is higher than the median for the previous quarter, and higher than the same quarter in 2014. There were two exceedance of the standard faecal coliform limit and a single exceedance of the upper limit.

Table 1.9.1 Pond Discharge Faecal Coliforms

Median Value [g/m ³] Current Monitoring Quarter (Feb 2015 – Apr 2015)	410	Number of Exceedances Current Monitoring Quarter (Feb 2015 – Apr 2015)	3
Median Value [g/m ³] Previous Monitoring Quarter (Nov 2014 – Jan 2015)	150	Number of Exceedances Previous Monitoring Quarter (Nov 2014 – Jan 2015)	1
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Feb 2014 – Apr 2014)	53	Number of Exceedances Same Monitoring Quarter of Previous Year (Feb 2014 – Apr 2014)	0

1.9.1 Pond Discharge Faecal Coliforms



2 Receiving Environment Monitoring in Pegasus Bay

2.1 Water Quality Resource Consent Conditions

All samples were collected and analysed as required by consent condition 18. Samples for condition 18 are collected from South New Brighton Beach at Jellicoe Street, Sumner Beach at the surf club, and New Brighton at the Surf Club. Sampling for condition 22a was completed March 2015.

Table 2.1.1 Receiving Environment Water Quality Consent Compliance February – April 2015

Consent Condition	Parameter	Compliance Condition	Compliance
			Feb – Apr 15
18	Faecal Coliforms	Sampled and Analysed	J
	Enterococci	Sampled and Analysed	J
22a	Temperature	2 yearly	J
	DO	2 yearly	J
	Salinity	2 yearly	J
	Total Suspended Solids	2 yearly	J
	Nitrogen Oxides	2 yearly	J
	Ammoniacal Nitrogen	2 yearly	J
	Dissolved Reactive Phosphorus	2 yearly	J
	Chlorophyll-a	2 yearly	J
	Trace Metals	2 yearly	J
	Faecal Coliforms	2 yearly	J
Enterococci	2 yearly	J	
	Phytoplankton Species	2 yearly	J

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

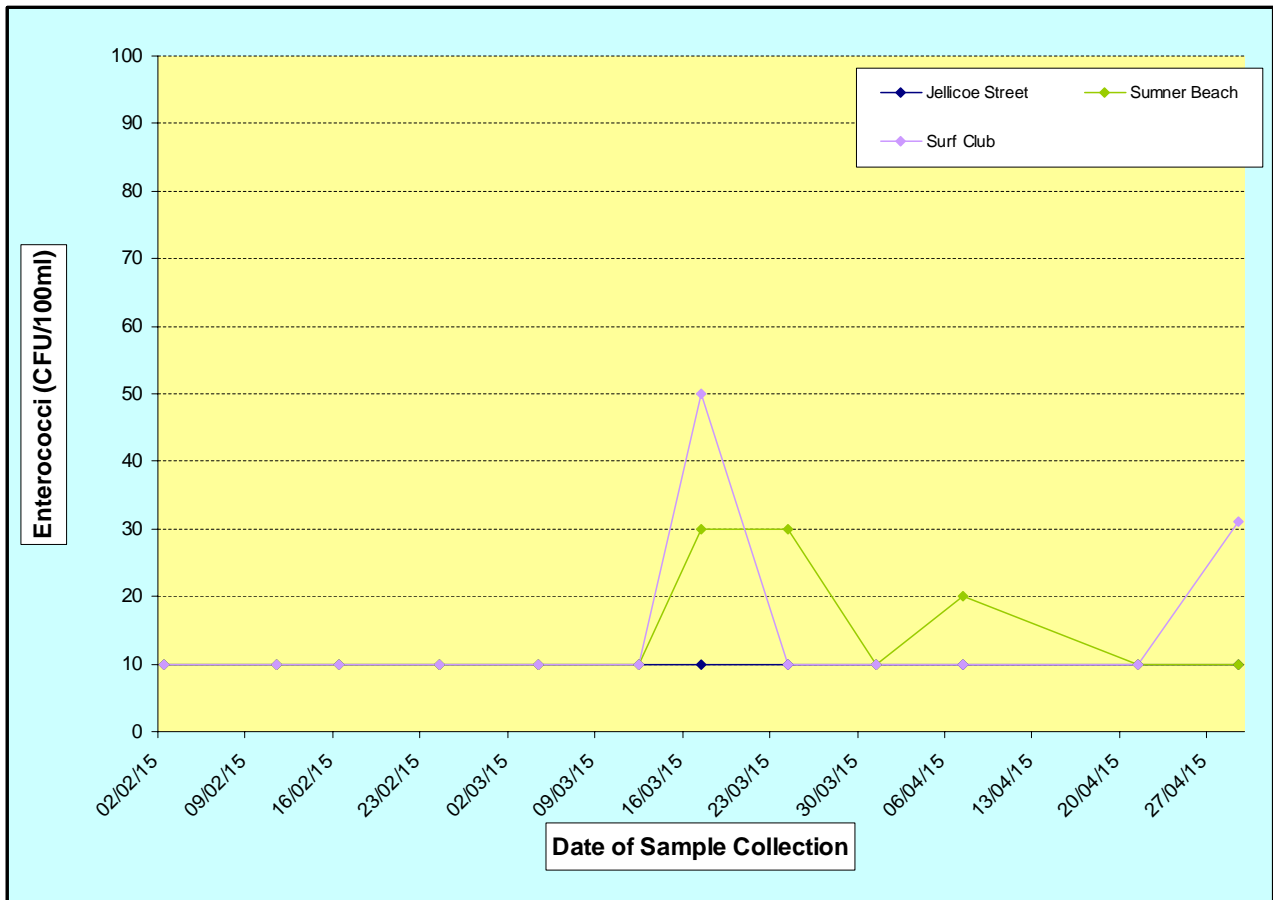
2.2 Comments on Compliance

All results for the Pegasus Bay area were within consent for the recording period.

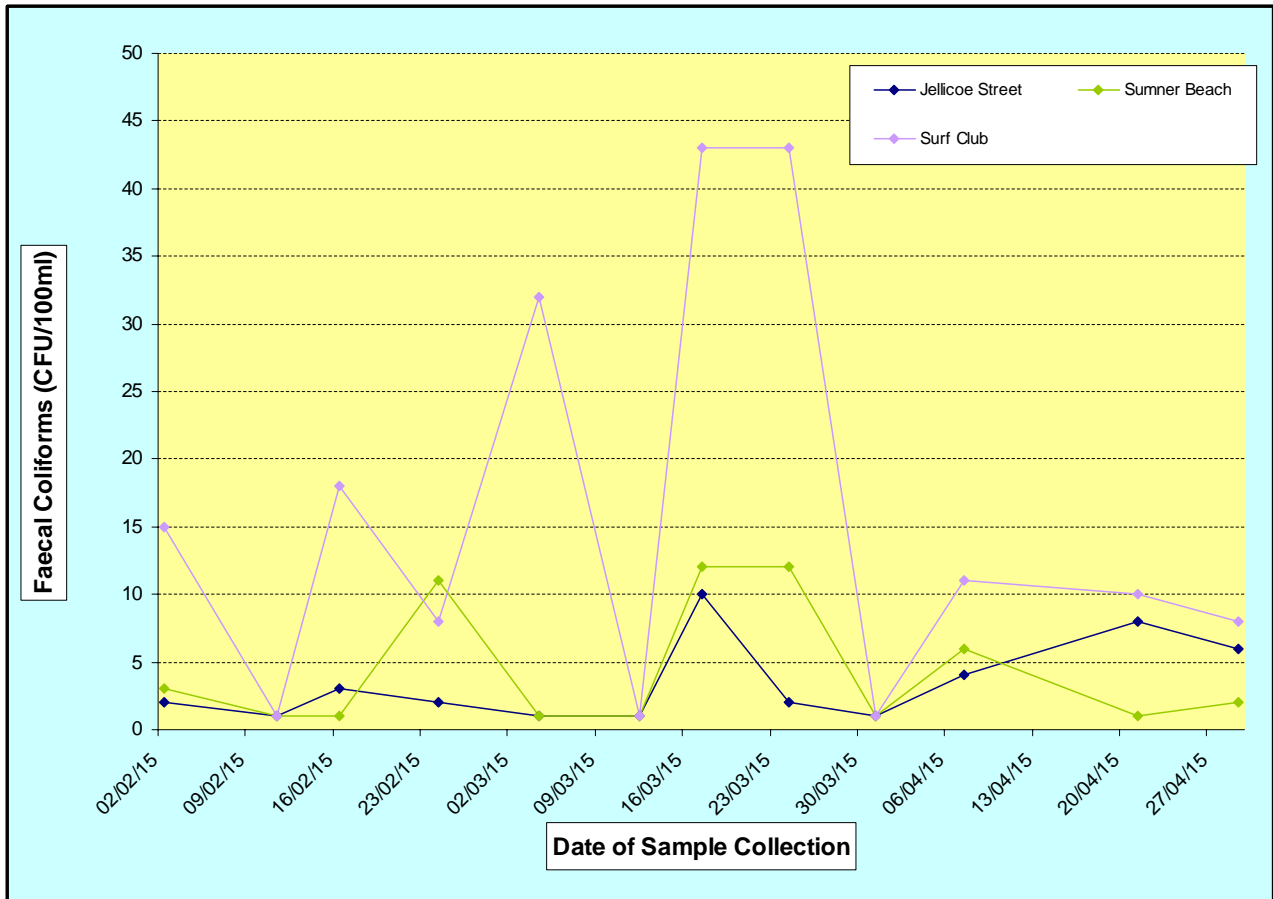
Beach Water Quality Analysis Results

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

2.2.1 Enterococci Levels at beaches adjacent to the Outfall



2.2.2 Faecal Coliform Levels at beaches adjacent to the Outfall



2.3 Other Receiving Environment Analysis

Consent conditions 23, 25, 26 and 27 call for monitoring of the marine environment around the outfall at various frequencies, some of which fall in the February – April 2015 monitoring period. These requirements are summarised in Table 2.4.1, and the results are attached as an appendix to this report. Sampling for Conditions 23 – 26 are due 2017, while condition 36 is due in December.

Table 2.3.1 Receiving Environment Monitoring Consent Compliance February – April 2015

Consent Condition	Parameter	Frequency	Compliance Condition	Compliance
				Feb – Apr 15
23	Marine Sediments	5-yearly	Not monitored this quarter	—
25	Benthic Invertebrates	5-yearly	Not monitored this quarter	—
26	Epibenthic Fauna	5-yearly	Not monitored this quarter	—
27	Shellfish	Quarterly	Sampled and analysed	J
29	Complaints	As required	Recorded and reported	J
31	Report	Quarterly and Annually	Report and information lodged with ecan	J
36	Community Liaison Group	Annually	Not done this quarter	—

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

2.4 Comments on Compliance

No complaints regarding the ocean outfall have been received this quarter. This report and supporting documentation will be submitted to Environment Canterbury.