



CHRISTCHURCH

CITY COUNCIL • YOUR PEOPLE • YOUR CITY

Christchurch Wastewater Treatment Plant

Quarterly Monitoring Report

February 2013 – April 2013

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 2013.doc

Contact: Lee Liaw

Summary

This report summarises the results of parameters monitored by the Christchurch Wastewater Treatment Plant (CWTP) over the period February 2013 to April 2013 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 consent, all the samples were collected during the monitoring period and most monitored parameters achieved the required standards.

A project to replace the pipes between oxidation ponds 2 and 3 (under Dyers Rd) required both ponds to be emptied and isolated. This has resulted in a single exceedance of the suspended solids and a separate exceedance of the dissolvable BOD at differing times during the quarter. Another project, to replace the pipes from the main plant to the ponds under Cuthberts Rd, is underway and is not expected to be finished until late 2013. Until the repairs have been completed, this will have an affect on pond disinfection.

A single exceedance of the tuatua e.coli limit occurred at the Sumner Surf club sample area in March. ECan was advised as soon as CWTP received the results and warning signs were placed around the sampling area. A follow-up sample taken soon after, showing e.coli readings dropped below the 2.3 MPN/ml limit. Signs on the beach were subsequently removed. There was no records indicating sewer overflows that could have caused it, and an investigation of potential sources shows the likely contamination source was a stormwater outlet near The Esplanade (Sumner).

Christchurch Wastewater Treatment Plant Contents

Quarterly Monitoring Report

February 2013 to April 2013

SUMMARY	2
1 OUTFALL DISCHARGE	4
1.1 <i>Resource Consent Conditions</i>	4
1.2 <i>Comments on Compliance</i>	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 Feb 2013 – Apr 2013 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance			
			Feb 13	Mar 13	Apr 13	Overall
2	Discharge Content	Discharge is only wastewater from the CWTP ponds	☺	☺	☺	☺
3	Discharge Volume	Recorded	☺	☺	☺	☺
4	Discharge Rate	Recorded	☺	☺	☺	☺
9	Outfall Maintenance	Routine maintenance completed and recorded	☺	☺	☺	☺
10	Outfall Condition	Visual inspection of outfall	n/a	n/a	n/a	n/a
12	Pumping Pressure for a given flow	Monitored	☺	☺	☺	☺

Key: ☺ Full Compliance ☹ Minor, Isolated or Risk of Non-Compliance ☹ Major or Consistent Non-Compliance

1.2 Comments on Compliance

Flowrate and pressure data were recorded as per consent requirements.

CWTP Ocean Outfall Daily Flow Totals

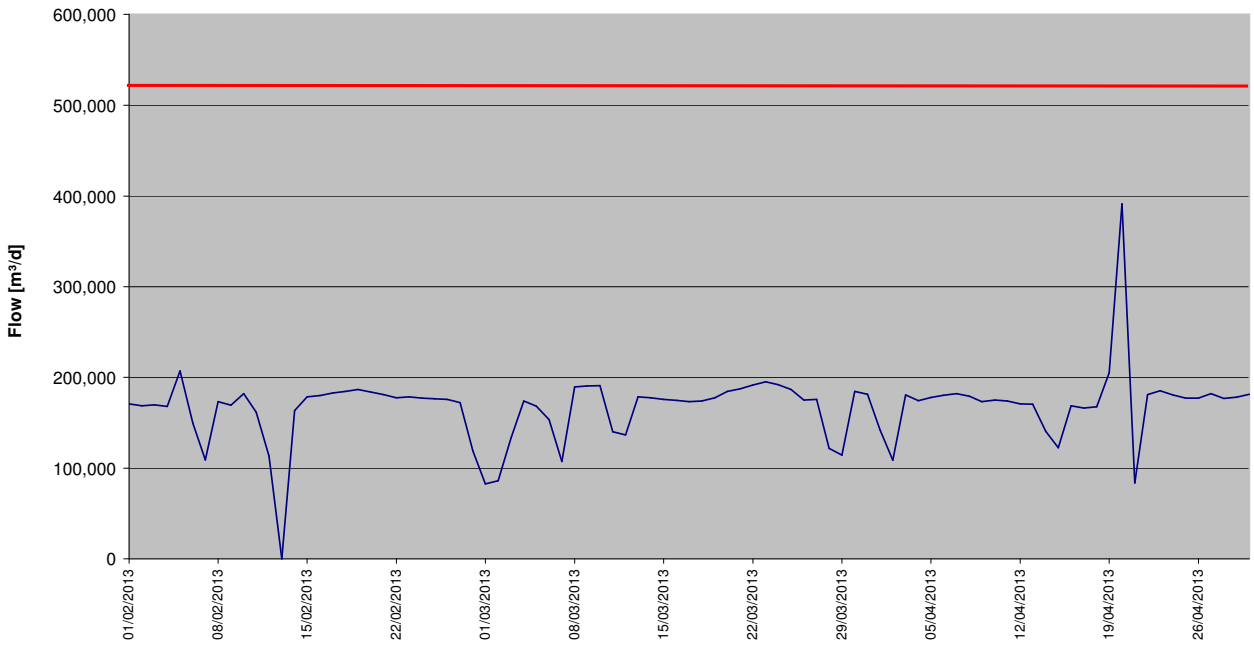


Figure 1.2.1 - Daily Outfall Flow Totals

Pond 6 Peak Discharge Flow Rate (m3/s)

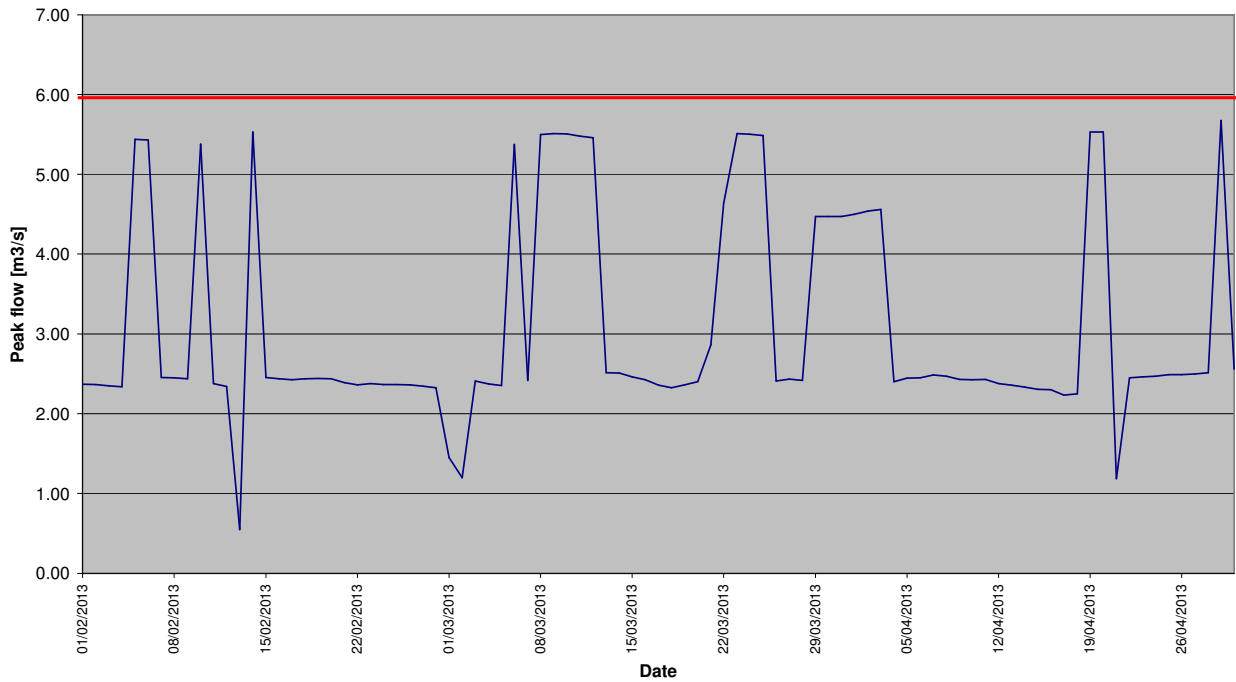


Figure 1.2.2 - Daily Peak Outfall Flows

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 Feb– Apr 2013 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance			
			Feb 13	Mar 13	Apr 13	Overall
15a	Dissolved BOD ₅	Concentration does not exceed 20 g/m ³	☺	☹	☺	☹
	Total Suspended Solids	Concentration does not exceed 50 g/m ³	☺	☺	☹	☹
	Ammoniacal Nitrogen	Concentration does not exceed 40 g/m ³	☺	☺	☺	☺
16a	Faecal Coliforms	Concentration does not exceed 1,000(standard)/5,000(higher) MPN/100mL	☺	☺	☺	☺
	Enterococci	Concentration does not exceed 1,500 MPN/100mL	☺	☺	☺	☺

Key: ☺ Compliance Achieved with no Exceedance of Standard ☹ Compliance Achieved with Occasional Exceedance of Standard
 ☹ Exceedance of Standard resulting in Non-Compliance

1.4 Comments on Compliance

As pond repairs were still continuing throughout the quarter, the shorter residence time has resulted in algae reaching the Ocean Outfall sample point. This unusual growth of algae has resulted in a single BOD exceedance for March and a single suspended solids exceedance for April.

Pathogen testing, as part for Condition 13e, was completed in March.

Due to the lab making an error in sampling, testing for e. coli for 28/02/13 was missed.

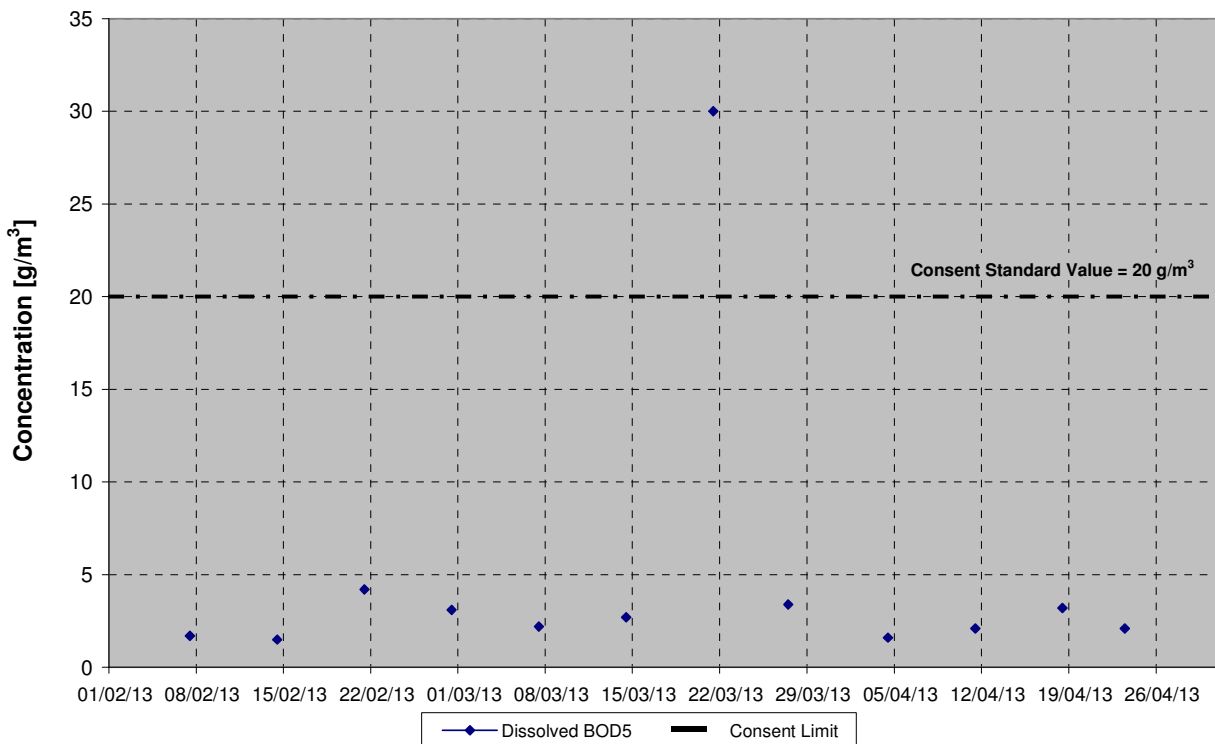
1.5 Dissolved BOD₅ Compliance

The median dissolved BOD₅ concentration for the period February – April 2013 was 2.5g/m³. This is higher than the median concentrations in the previous quarter and lower than the same quarter in 2012. There was a single exceedance of the standard value (20 g/m³) in the current monitoring quarter due to the unexpected growth of algae in the final oxidation pond caused by earthquake repairs.

Table 1.5.1 Pond Discharge Dissolved BOD₅

Median Value [g/m ³] Current Monitoring Quarter (Feb 2012 – Apr 2013)	2.5	Number of Exceedances Current Monitoring Quarter (Feb 2013 – Apr 2013)	1
Median Value [g/m ³] Previous Monitoring Quarter (Nov 2012 – Jan 2013)	1.5	Number of Exceedances Previous Monitoring Quarter (Nov 2012 – Jan 2013)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Feb 2012 – Apr 2012)	3.4	Number of Exceedances Same Monitoring Quarter of Previous Year (Feb 2012 – Apr 2012)	0

1.5.2 Pond Discharge Dissolved BOD₅



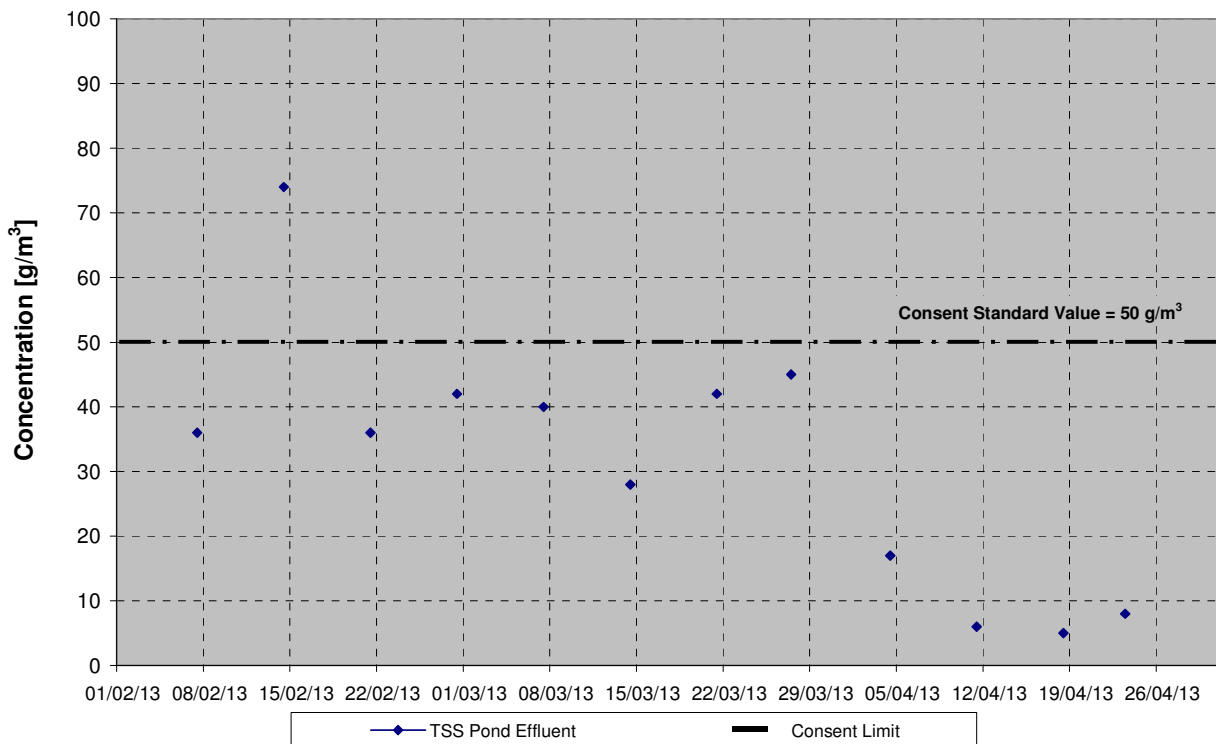
1.6 Total Suspended Solids Compliance

The median total suspended solids concentration for the period February – April 2013 was 36g/m³. This is higher than both the previous quarter and the same quarter in 2012. There was a single exceedance of the standard value (50 g/m³). This can be attributed to earthquake repair work on the transfer pipes between ponds 2 and 3, which reduced the residence time and lead to an increase in algae.

Table 1.6.1 Pond Discharge Total Suspended Solids

Median Value [g/m ³] Current Monitoring Quarter (Feb 2013 – Apr 2013)	36	Number of Exceedances Current Monitoring Quarter (Feb 2013 – Apr 2013)	1
Median Value [g/m ³] Previous Monitoring Quarter (Nov 2012 – Jan 2013)	16	Number of Exceedances Previous Monitoring Quarter (Nov 2012 – Jan 2013)	2
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Feb 2012 – Apr 2012)	9	Number of Exceedances Same Monitoring Quarter of Previous Year (Feb 2012 – Apr 2012)	0

1.6.2 Pond Discharge Total Suspended Solids



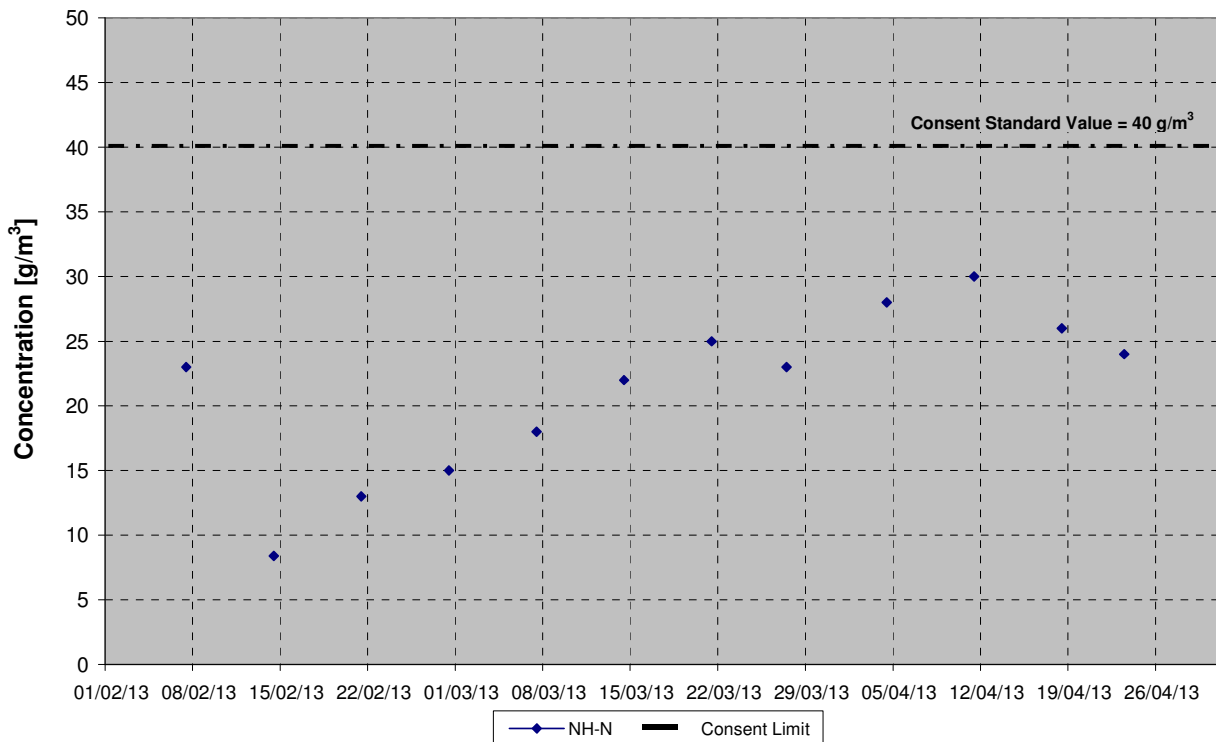
1.7 Ammonia Nitrogen Compliance

The median total ammonia nitrogen concentration for the period February – April 2013 was 23 g/m³. This was marginally higher than both the previous quarter and same quarter in 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 2013 – Apr 2013)	23	Number of Exceedances Current Monitoring Quarter (Feb 2013 – Apr 2013)	0
Median Value [g/m ³] Previous Monitoring Quarter (Nov 2012 – Jan 2013)	22	Number of Exceedances Previous Monitoring Quarter (Nov 2012 – Jan 2013)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Feb 2012 – Apr 2012)	17	Number of Exceedances Same Monitoring Quarter of Previous Year (Feb 2012 – Apr 2012)	0

1.7.1 Pond Discharge Ammoniacal Nitrogen



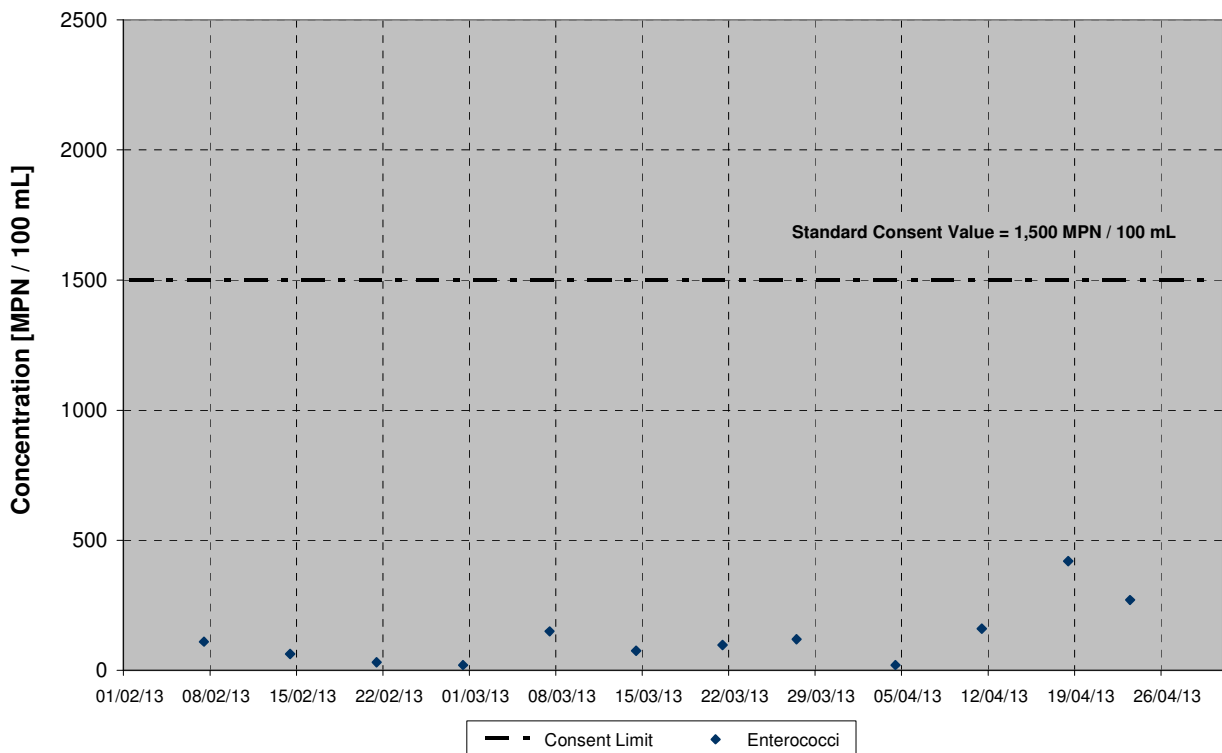
1.8 Enterococci Monitoring

The median enterococci concentration in the February – April 2013 reporting period was 104 MPN/100mL. This was higher than previous quarter and also higher than the same quarter in 2012. There were no exceedances of the 1,500 MPN/100ml limit during the reporting quarter.

Table 1.8.1 Pond Discharge Enterococci

Median Value [g/m ³] Current Monitoring Quarter (Feb 2013 – Apr 2013)	104	Number of Exceedances Current Monitoring Quarter (Feb 2013 – Apr 2013)	0
Median Value [g/m ³] Previous Monitoring Quarter (Nov 2012 – Jan 2013)	41	Number of Exceedances Previous Monitoring Quarter (Nov 2012 – Jan 2013)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Feb 2012 – Apr 2012)	41	Number of Exceedances Same Monitoring Quarter of Previous Year (Feb 2012 – Apr 2012)	0

1.8.1 Pond Discharge Enterococci



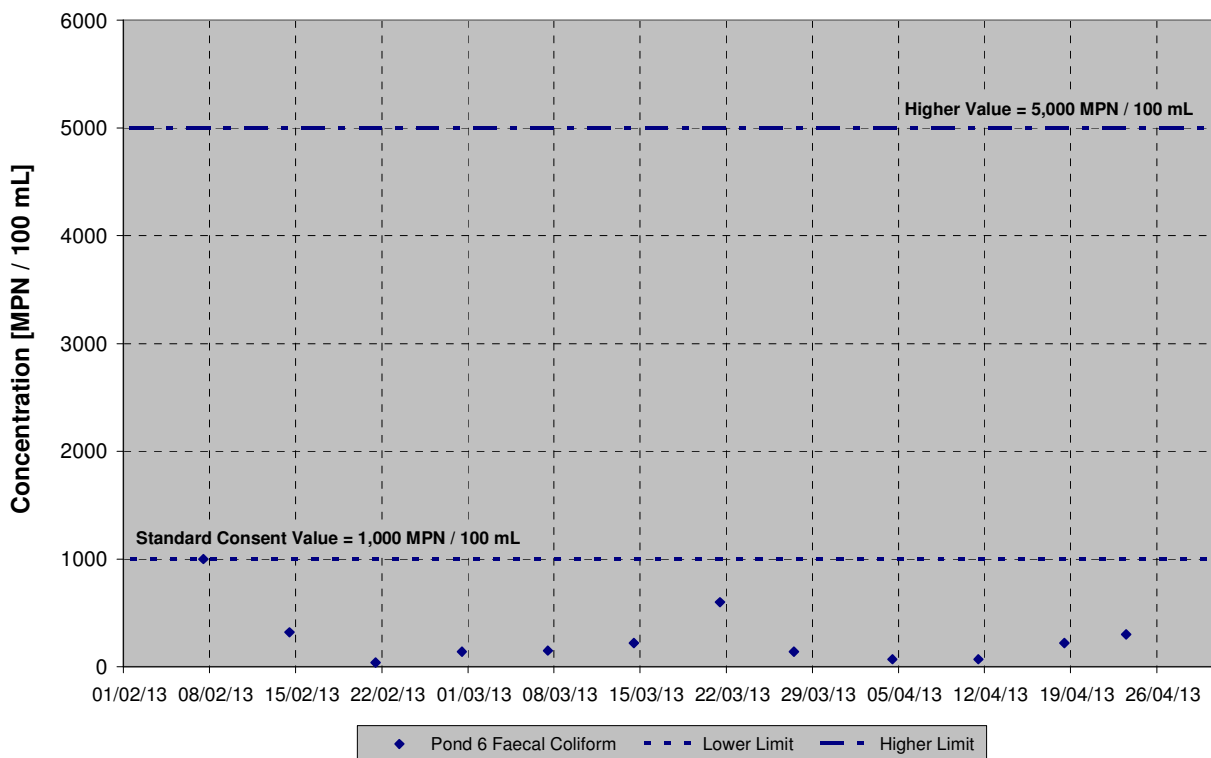
1.9 Faecal Coliform Compliance

The median concentration for the reporting period was 185 MPN/100 mL, which is higher than the median for the previous quarter, and lower than the same quarter in 2012. There were no breaches of either the standard or higher limits.

Table 1.9.1 Pond Discharge Faecal Coliforms

Median Value [g/m ³] Current Monitoring Quarter (Feb 2013 – Apr 2013)	185	Number of Exceedances Current Monitoring Quarter (Feb 2013 – Apr 2013)	0
Median Value [g/m ³] Previous Monitoring Quarter (Nov 2012 – Jan 2013)	140	Number of Exceedances Previous Monitoring Quarter (Nov 2012 – Jan 2013)	1
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Feb 2012 – Apr 2012)	290	Number of Exceedances Same Monitoring Quarter of Previous Year (Feb 2012 – Apr 2012)	3

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. Ocean samples for condition 22 were collected 20/03/13 and are attached to this report.

Table 2.1.1 Receiving Environment Water Quality Consent Compliance Feb 2013 – Apr 2013

Consent Condition	Parameter	Compliance Condition	Compliance
			Feb 13 – Apr 13
18	Faecal Coliforms	Sampled and Analysed	☺
	Enterococci	Sampled and Analysed	☺
22a	Temperature	2 yearly – done this quarter	☺
	DO	2 yearly – done this quarter	☺
	Salinity	2 yearly – done this quarter	☺
	Total Suspended Solids	2 yearly – done this quarter	☺
	Nitrogen Oxides	2 yearly – done this quarter	☺
	Ammoniacal Nitrogen	2 yearly – done this quarter	☺
	Dissolved Reactive Phosphorus	2 yearly – done this quarter	☺
	Chlorophyll-a	2 yearly – done this quarter	☺
	Trace Metals (arsenic, cadmium, copper, chromium, lead, nickel and zinc)	2 yearly – done this quarter	☺
	Faecal Coliforms	2 yearly – done this quarter	☺
	Enterococci	2 yearly – done this quarter	☺
	Phytoplankton Species	2 yearly – done this quarter	☺

Key: ☺ Full Compliance ☹ Minor. Isolated or Risk of Non-Compliance ☹ Major or Consistent Non-Compliance

2.2 Comments on Compliance

All results for the Pegasus Bay area were within consent for February – April 2013.

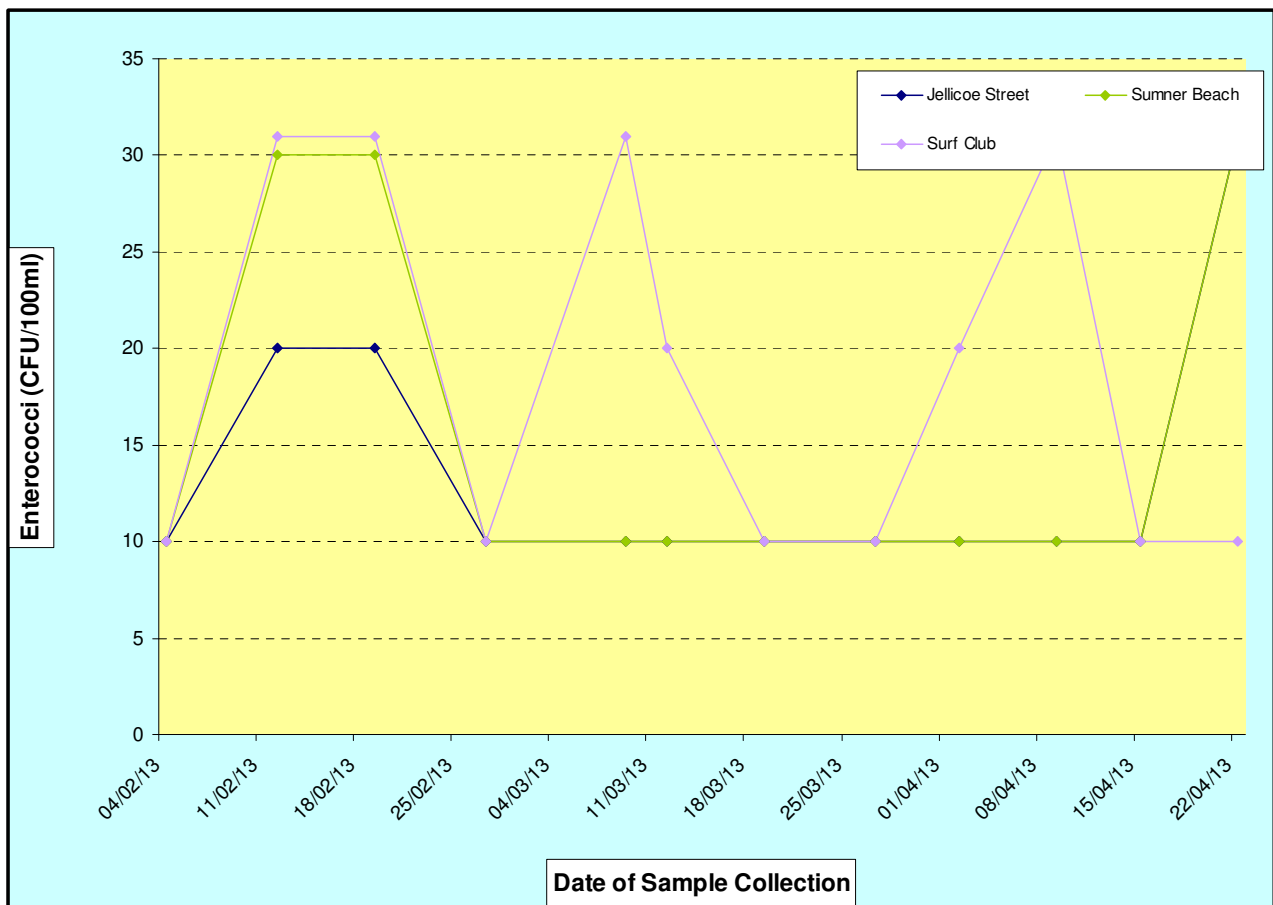
2.3 Ocean Diffuser Analysis Results

Four ocean samples taken around the outfall diffuser during March and analysed as per Condition 17 and 22. The overall condition of the samples was good with ammonia below detectable limits, no scums or foams, and no bacterial contamination. The phytoplankton results showed pseudonitzschia above trigger levels.

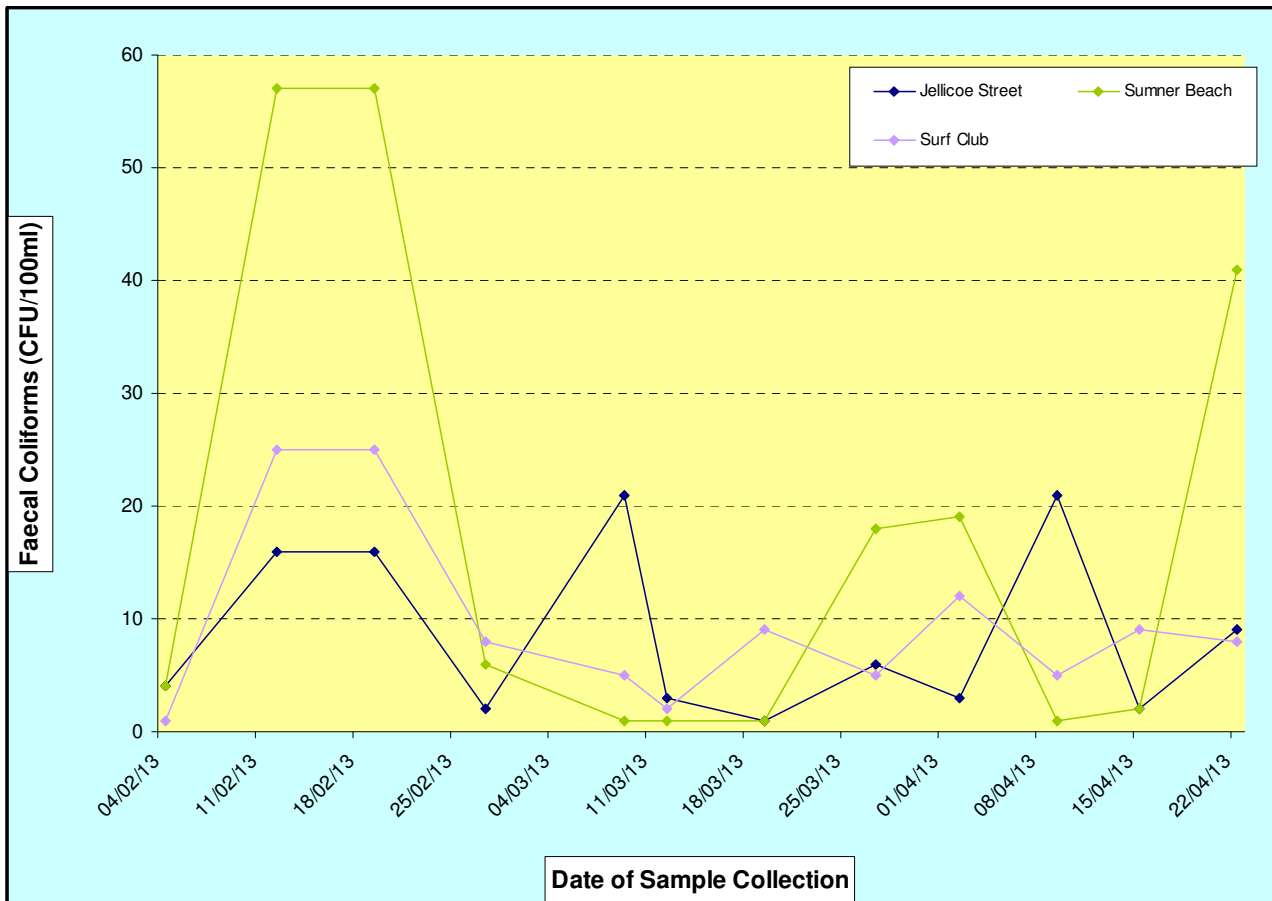
2.4 Beach Water Quality Analysis Results

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.

2.4.1 Enterococci Levels at beaches adjacent to the Outfall



2.4.2 Faecal Coliform Levels at beaches adjacent to the Outfall



2.5 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 2013 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.

Table 2.5.1 Receiving Environment Monitoring Consent Compliance Feb 2013 – Apr 2013

Consent Condition	Parameter	Frequency	Compliance Condition	Compliance
				Feb 13 – Apr 13
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	☹
29	Complaints	As required	Recorded and Reported	☺
31	Report	Quarterly and Annually	Report and information lodged with ECan	☺

Key: ☺ Full Compliance ☹ Minor, Isolated or Risk of Non-Compliance ☹ Major or Consistent Non-Compliance

2.6 Comments on Compliance

Both repairs to pond transfer structures under Cuthbert’s Road and Dyers Road are underway and is expected to continue until late 2013. This will reduce the pond’s ability to disinfect pathogens for the duration of the repairs.

Shellfish were sampled and analysed. A single exceedance of the tuatua e.coli limit occurred at the Sumner Surf club and CWTP were notified 11/04/13 of the high result. ECan was advised immediately and signs, warning members of the public to avoid shellfish collection, were placed around the sampling area. A follow-up sample was taken by EOS Ecology at the earliest possible opportunity (15/04/13) and showed e.coli readings were below the 2.3 MPN/ml limit. Signs on the beach were subsequently removed. Records did not show any sewer overflows that could have caused the exceedance, but it is possible the contamination source was a stormwater outlet located near The Esplanade (Sumner). All other samples did not exceed the 2.3 MPN/ml e.coli limit.

No odour complaints relating to the ocean outfall were received this quarter. The annual report was submitted to ECan in 2012 and accepted. This report and supporting documentation will be submitted to Environmental Canterbury.