

Bromley Wastewater Treatment Plant; Effluent Quality Monitoring of our Treated Wastewater Discharge

The Christchurch City Council holds a current resource consent ([CRC051724](#)) with Environment Canterbury to discharge treated wastewater into Pegasus Bay via a 3km long ocean outfall pipeline.

There are numerous reporting requirements the Council must adhere to in order to remain compliant. Key effluent quality indicators provide 'pulse check' on the quality of our wastewater discharge are monitored weekly these include;

- Biological Oxygen Demand - BOD5
- Total Suspended Solids -TSS
- Ammoniacal Nitrogen
- Faecal Coliforms
- Enterococci

In addition to these there are bi-weekly sample of an array of nitrogen species, six monthly sampling of common heavy metals and annual sampling of some pathogenic bacteria associated with municipal wastewater.

As per our consent requirements we required to submit these results to ECAN in three monthly intervals with a concluding annual report summary due each year. That is unless there is a specific set of exceedances in the results that would then require us to provide early notification (within 48 hours of receiving the results) to ECAN and the medical Officer of Health.

The November fire that took the trickling filters offline continues to have a knock-on effect on the treatment plants ability to treat effluent to the usual compliant standard. The increase in organic matter through the plant caused by the absence of trickling filters can impact every subsequent stage of the treatment process. Consequently the concentration of key effluent quality indicators have increased in the ocean outfall effluent discharge since the fire.

A summary and brief commentary of the last year's performance data of key quality indicators including recent pathogenic bacteria sampling and coastal water quality sampling near local surf lifesaving clubs is provided below

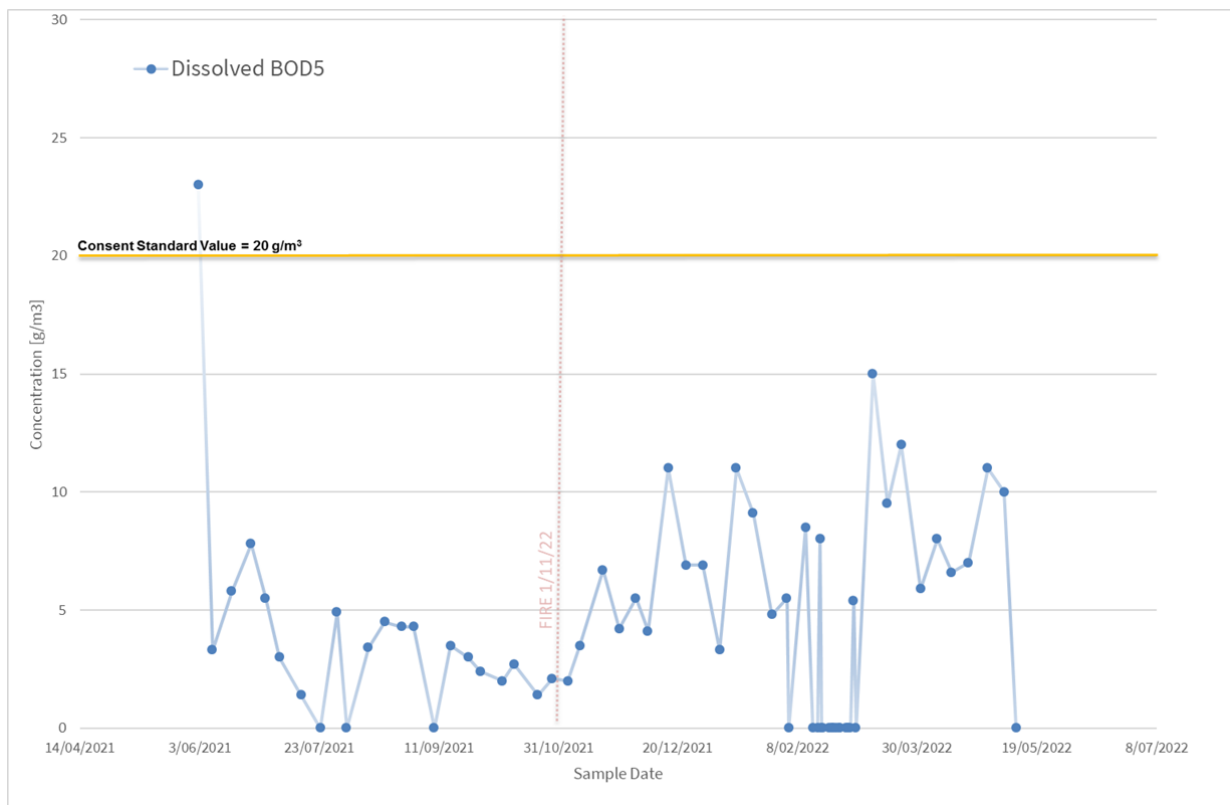
Key Effluent Quality Indicator Results

Biological Oxygen Demand

Dissolved oxygen is an essential element in a healthy aquatic environment. Biological Oxygen Demand (BOD5) is a measure of how much dissolved oxygen is required to breakdown organic matter in a sample. This in turn can inform us on the environmental impact a sample (treated wastewater in this case) would have on the receiving environment. A high measure of BOD5 indicates the sample will consume/deplete a proportionality high amount of oxygen in the environment into which it is discharged.

Our BOD5 levels remain fully compliant. BOD5 Concentrations have increased since the November fire however we have not breached the consent limit within the last six months.

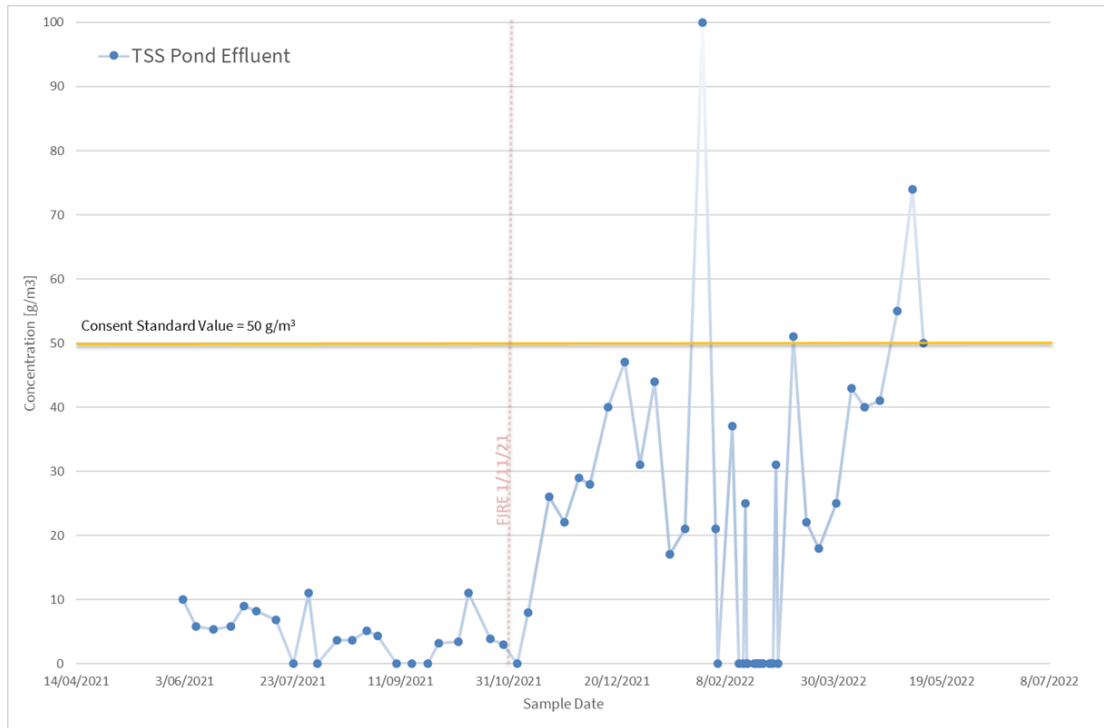
Note that our discharge consent permits 16 exceedances of BOD over a moving six month period before non-compliance & seven consecutive sample exceedances before we are required to immediately notify ECAN



Total Suspended Solids

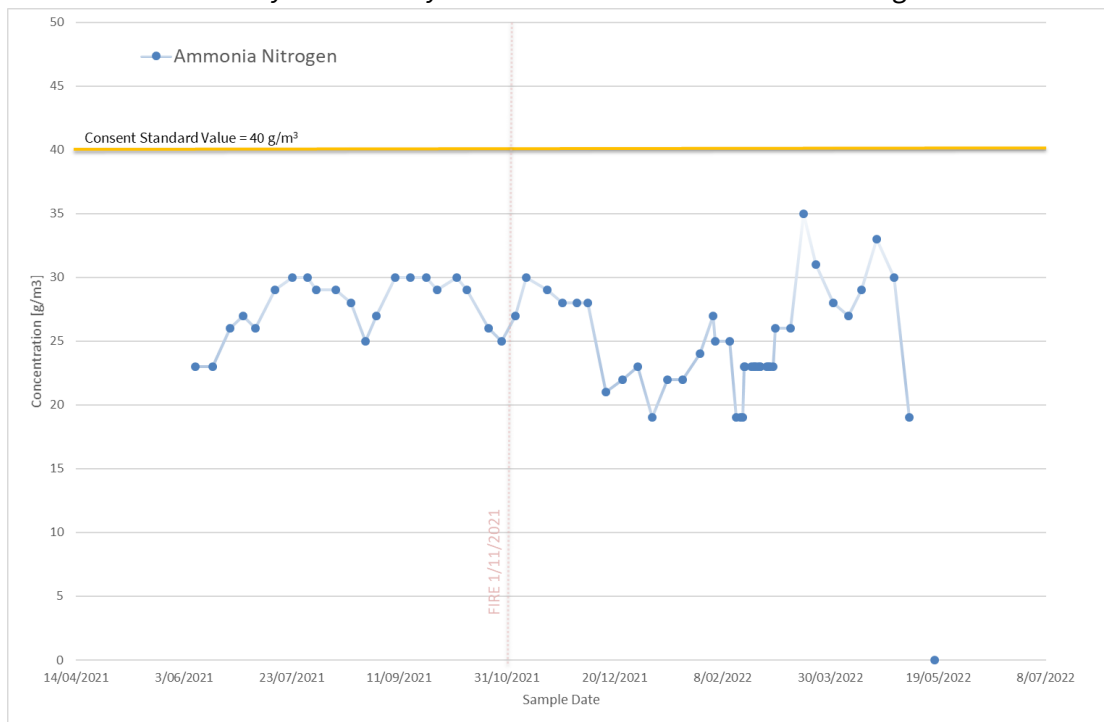
Suspended solids (TSS) are those solids which are large enough to be captured in filter paper. The intention is to provide a measure of the amount of particulates and debris either organic or inorganic contained in a sample. Clean water obviously has very little suspended solids so using clean water as a reference or desirable benchmark, we can gauge by the concentration of TSS how contaminated a sample may be without needing to find out exactly what the sample contains. Concentrations of suspended solids in our treated wastewater discharge have increased since the

November fire. However just like BOD are permitted to exceed 16 times over six months and not more than seven consecutive samples before it is considered an issue. So far there have been 5 exceedances in the last six months. The last three consecutive samples have exceeded the limit however we remain fully compliant.



Ammoniacal Nitrogen

All sample results for ammoniacal nitrogen over the last twelve months are fully compliant and within the limits set by ECAN in City Councils treated wastewater discharge consent.



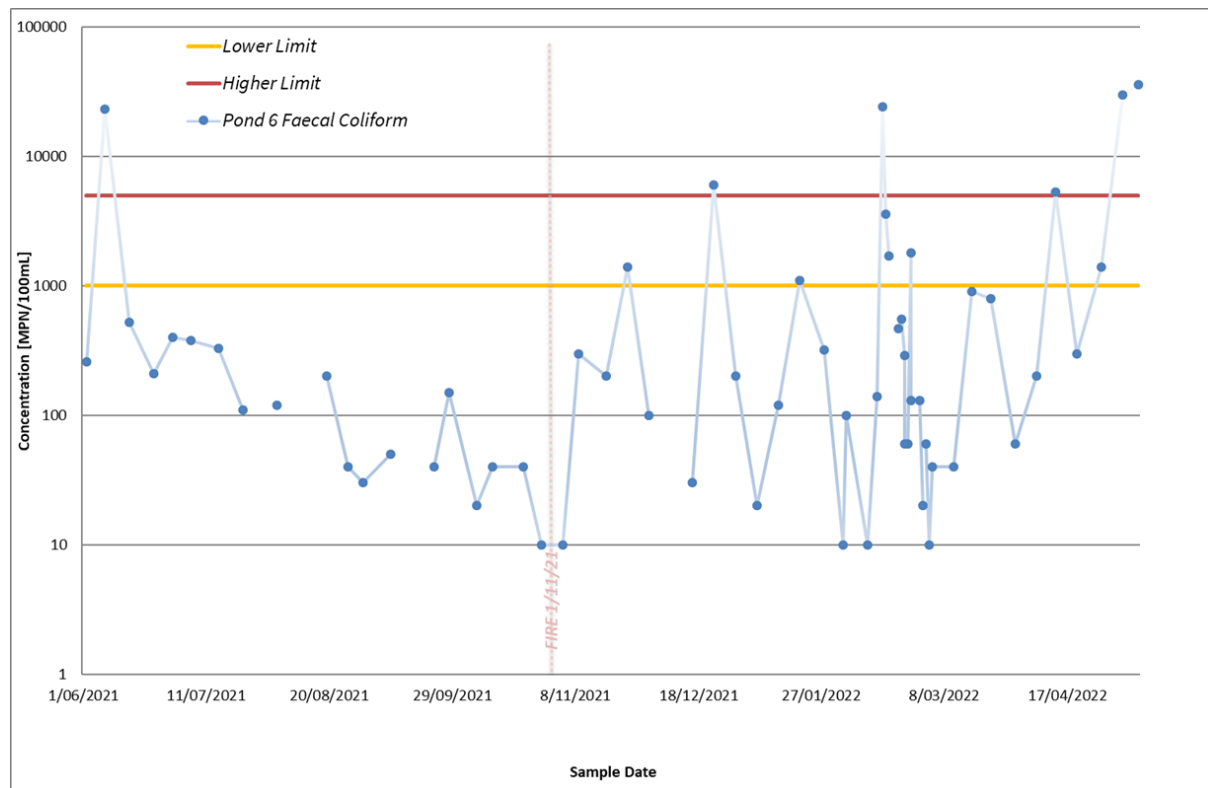
Faecal Coliform and Enterococci

Faecal Coliforms and Enterococci and pathogenic bacteria are bacteria that can cause disease and are commonly found in untreated wastewater (sewage) and are therefore a measure of these bacteria is a useful indicator to determine how effective a treatment system, such as our treatment plant in this case, is performing.

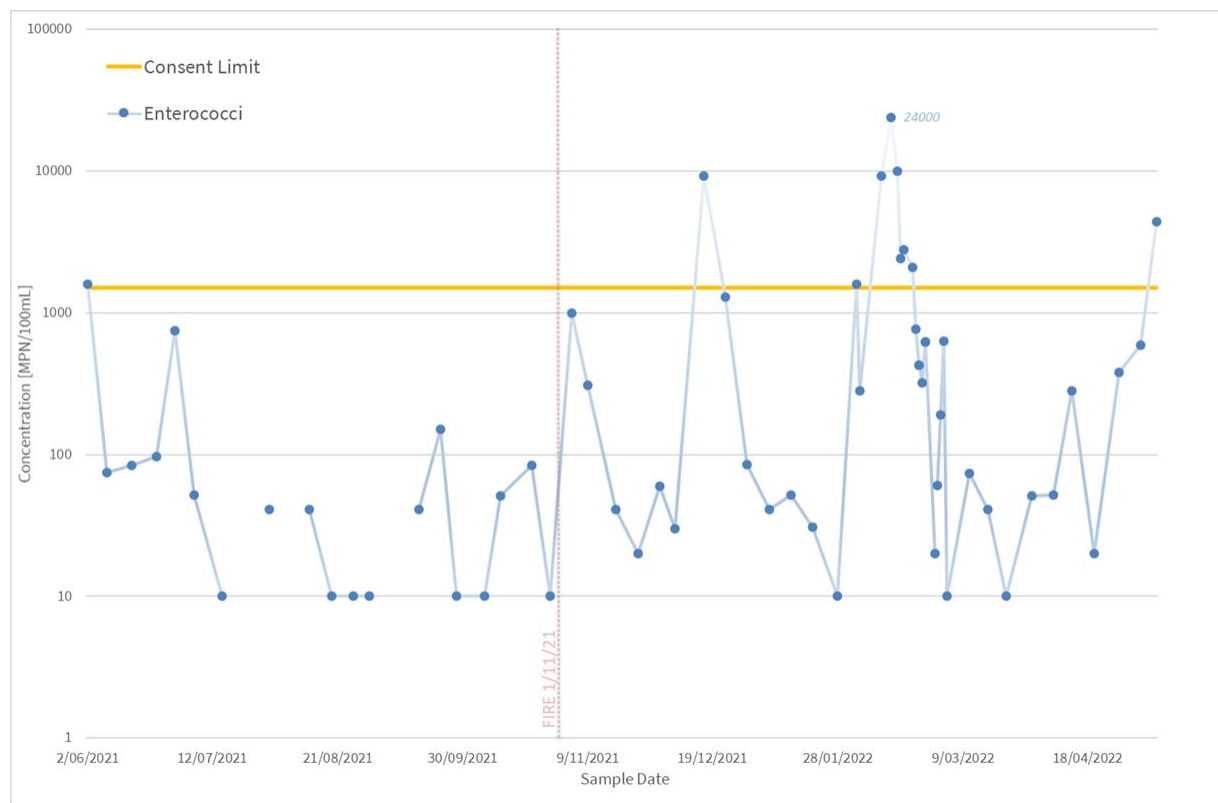
Our discharge consent permits a maximum of six consecutive samples above a 'standard value' and no more than two above a 'higher value' over a two month period. If this happens we are required to notify ECAN and the Canterbury District Health Board via the Medical Officer of Health within forty eight hours of the limit breach. The notification is to provide the samples results, the cause of the exceedance, solutions we are undertaking to remedy the issue and addresses any potential adverse effects on the environment and public health

Since the November fire we have two occasions when consecutive exceedances of Faecal Coliforms and Enterococci have triggered the notification process. Most recently this occurred during May. Keeping in mind that we discharge treated wastewater into deep ocean water three kilometres off shore, we simultaneously monitor Faecal Coliform and Enterococci weekly at common coastal recreational areas to ensure that there is no public health risk. To date all water quality samples taken at New Brighton Beach Surf Club, South New Brighton beach and Sumner Beach Surf Club are within the compliance parameters of our discharge consent.

Faecal Coliform (ocean outfall)



Enterococci (ocean outfall)

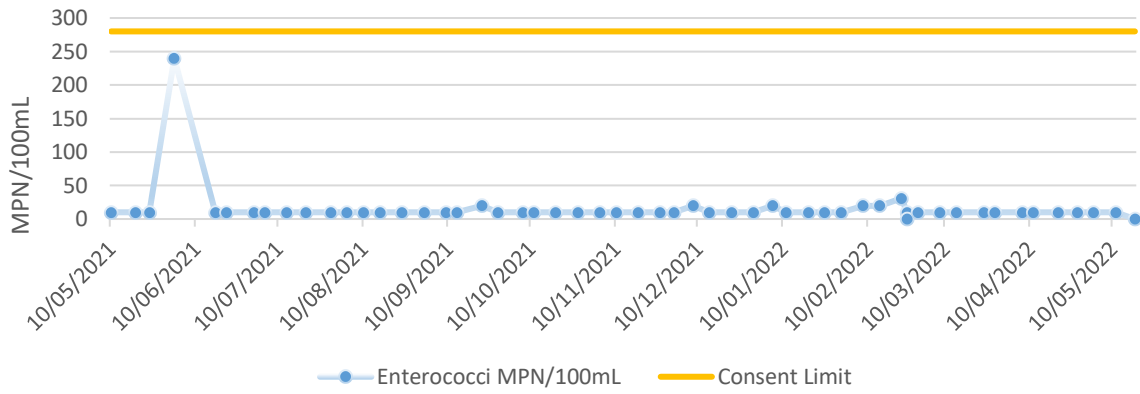


Beach/Recreational Water Quality Sampling

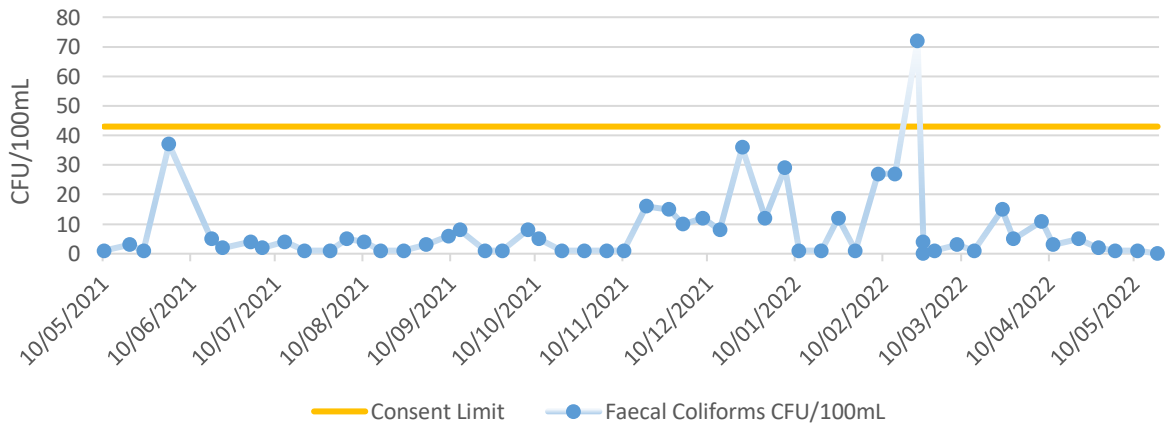
The discharge consent requires that we also undertake weekly water quality sample for Faecal Coliforms and Enterococci at South New Brighton Beach, Sumner Beach Surf Club and New Brighton Surf Club. If anyone sample returns a Faecal Coliform count higher than 43/100ml and an Enterococci count higher than 280, we collect a second sample within twenty four hours. This allows us to eliminate erroneous or false positive results potentially caused by bird/fowl effluent or another source. Often after a significant rain event washout from the City's rivers can elevate local coliform and enterococci counts.

If both consecutive samples exceed the consent limits then the Council must notify ECAN and the Medical Officer of Health within forty eight hours of detection.

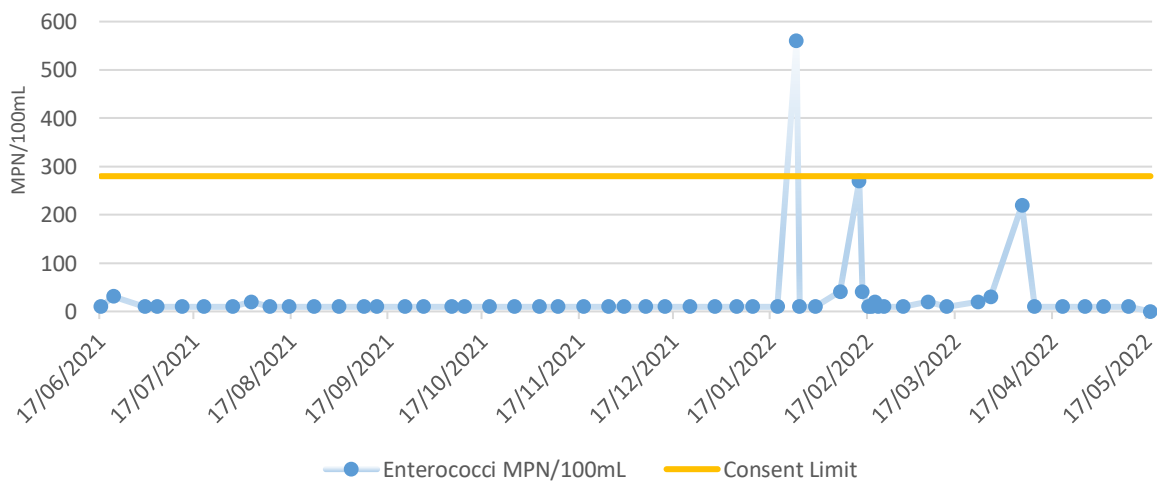
New Brighton Beach Surf Club - Enterococci Results



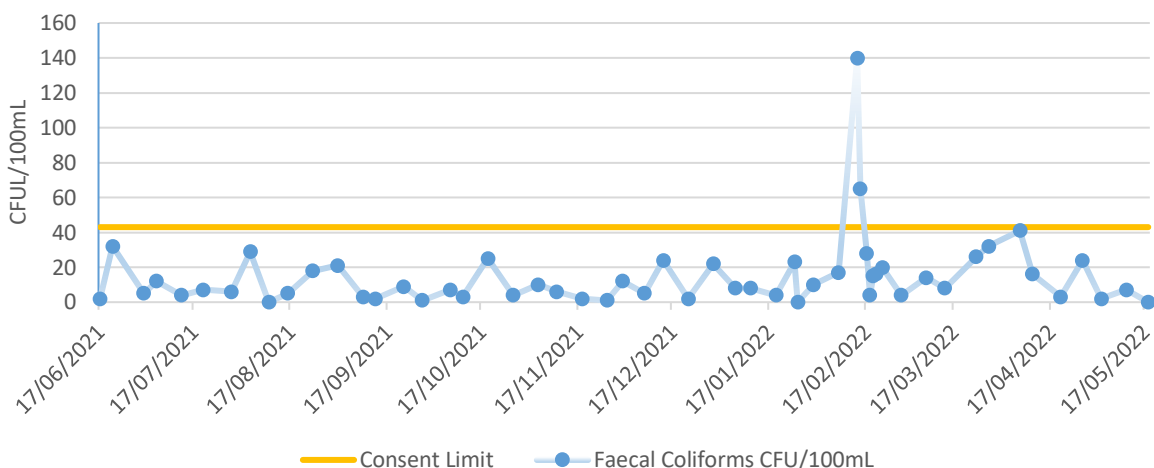
New Brighton Beach Surf Club - Faecal Coliform Results



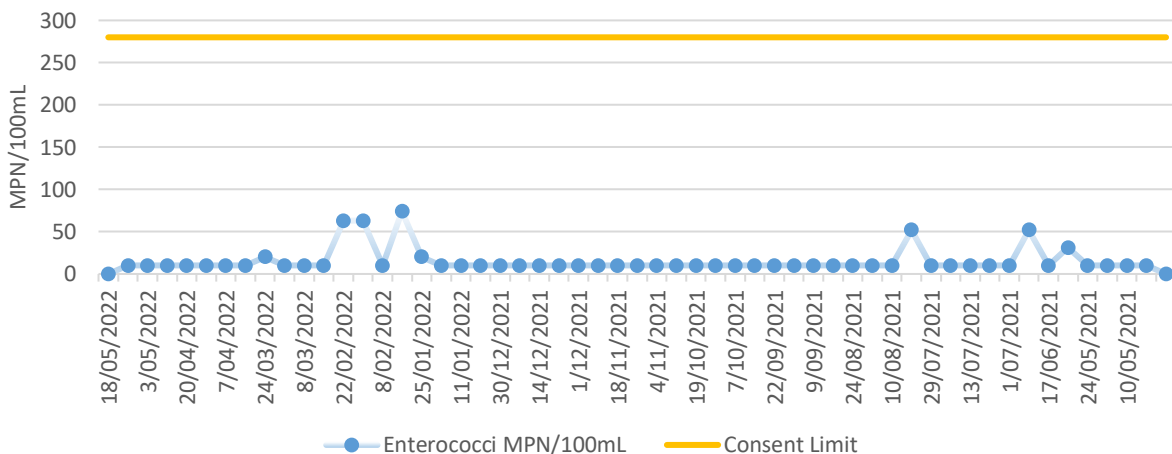
Sumner Beach Surf Club - Enterococci Results



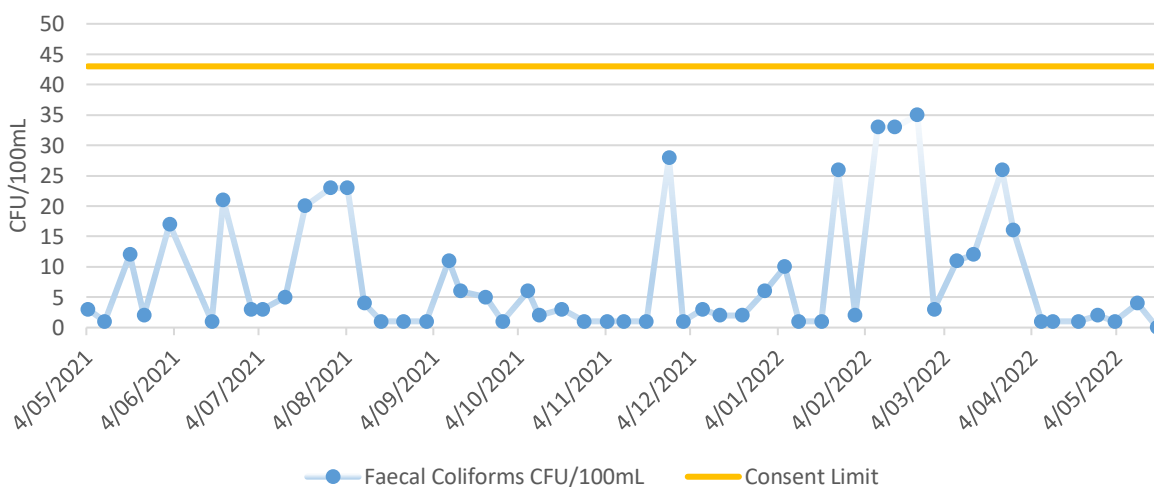
Sumner Beach Surf Club - Faecal Coliform Results



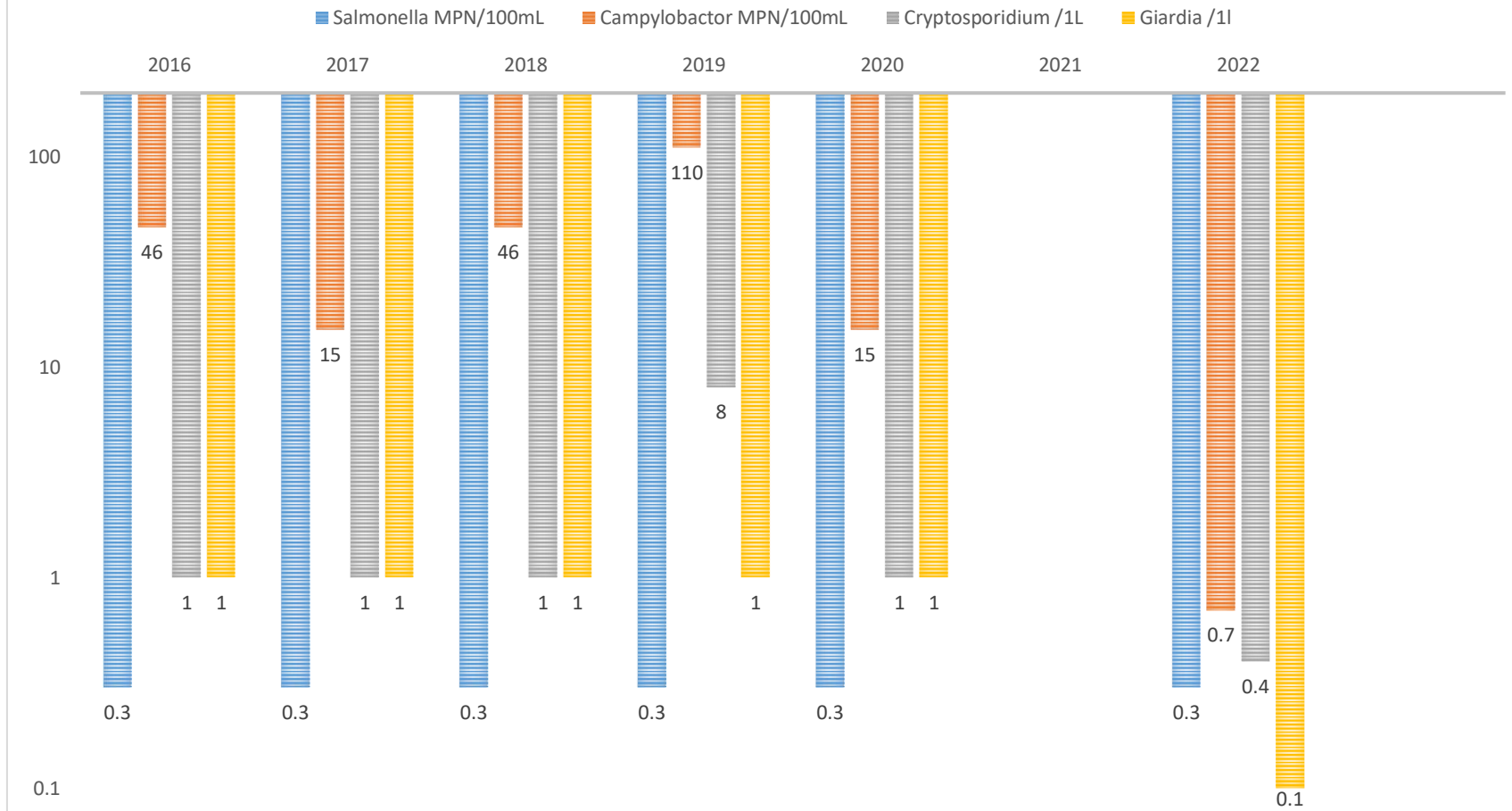
South New Brighton Beach - Enterococci Results



South New Brighton Beach - Faecal Coliform Results



ANNUAL PATHOGENIC BACTERIA SAMPLE RESULTS



	Salmonella MPN/100mL	Campylobacter MPN/100mL	Cryptosporidium /1L	Giardia /1L
2016	0.3	46	>1	>1
2017	0.3	15	>1	>1
2018	0.3	46	>1	>1
2019	0.3	110	8	>1
2020	0.3	15	>1	>1
2021	n/a	n/a	n/a	n/a
2022	0.3	0.7	0.4	0.1