

Performance of the Paraparaumu Wastewater Treatment Plant

Council operates the Paraparaumu Wastewater Treatment Plant (PWWTP) under the WGN970255 resource consent. The consent requires Council to achieve a standard of effluent water quality before it discharges into the Mazengarb.

Condition 18 sets out what Greater Wellington expects for the PWWTP effluent Water quality:

- (18) After 31 March 2002, the permit holder shall sample the treatment plant effluent at the sample point provided in condition 12 and the following effluent sampling quality criteria shall apply:
- (a) Based on no fewer than 12 flow proportioned 24-hour composite samples per month (3 of which must be taken during a weekend) the quality of the effluent shall meet the following standards:
- (i) BOD5: Geometric mean of 15 grams per cubic metre and no more than 1 sample of the 12 monthly samples shall exceed 25 grams per cubic metre.
- (ii) Suspended Solids: Geometric mean of 15 grams per cubic metre and no more than 1 sample of the 12 monthly samples shall exceed 25 grams per cubic metre.
- (b) Based on no fewer than 12 representative samples per month (such samples shall be taken on separate days within that month between the hours of 10.00 am and 5.00pm and three of which must be taken during a weekend) the effluent shall meet the following standard:
- (i) Faecal Coliform Bacteria: Geometric mean of 200 per 100 millilitres and no more than 1 sample of the 12 samples in each month shall exceed 5000 per 100 millilitres.
- (ii) The acidity or alkalinity of the effluent as measured by pH shall be kept within the range of 6.0 to 9.0.
- (c) Based on 36 consecutive and representative samples collected at rates of no fewer than 6 samples per month and 1 per week (all samples shall be taken on separate days and between the hours of 10.00 am and 5.00 pm

and at least four samples shall be taken on separate weekends), the effluent shall meet the following standards:

- No more than 3 samples of the 36 consecutive samples shall exceed 3.6g/m³ total ammonia as nitrogen.
- No sample shall exceed 30g/m³ nitrate (measured as N).

The permit holder shall also analyse the samples collected for clause (c) for dissolved reactive phosphorus, g/m³ as P, and total phosphorus, g/m³ as P.

- (d) Based on 36 consecutive and representative samples collected at a rate of no fewer than 12 samples per month (such samples shall be taken on separate days within that month between the hours of 10.00 am and 5.00pm and three of which must be taken during a weekend) the effluent shall meet the following standard:

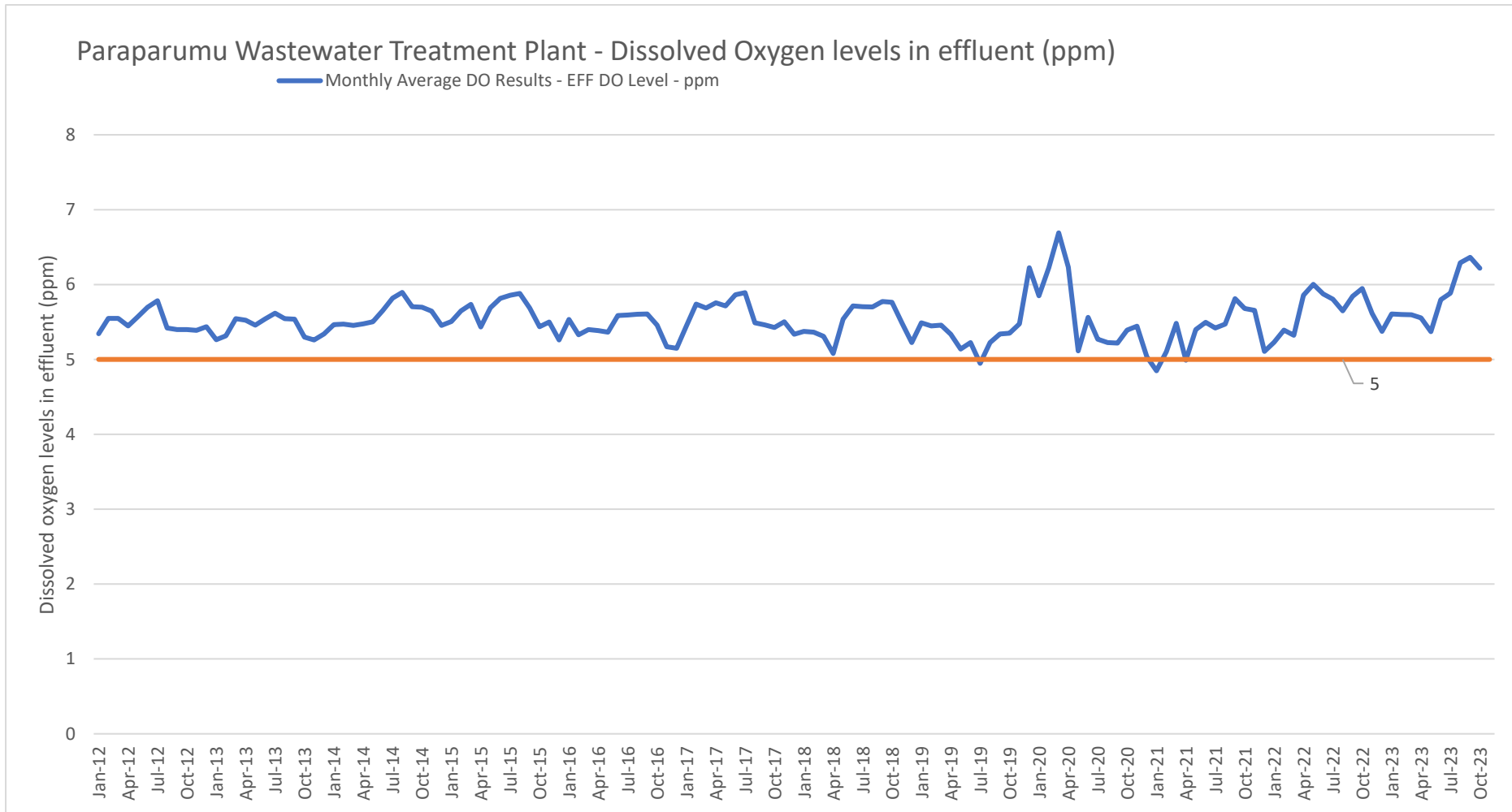
Dissolved Oxygen: No more than 3 samples of the 36 consecutive samples shall fall below 5 parts per million.

- (e) Based on no fewer than 1 flow proportioned 24-hour composite sample per month, or at such frequency as directed by the Manager, Consents Management, Wellington Regional Council, the effluent shall meet the following standard:

- Arsenic (III) 0.01 g/m³
- Copper as the element 0.01 g/m³
- Chromium (VI) 0.01 g/m³
- Cadmium as the element 0.004 g/m³
- Nickel as the element 0.1 g/m³
- Mercury as the element 0.0002 g/m³
- Lead as the element 0.01 g/m³
- Zinc as the element 0.10 g/m³

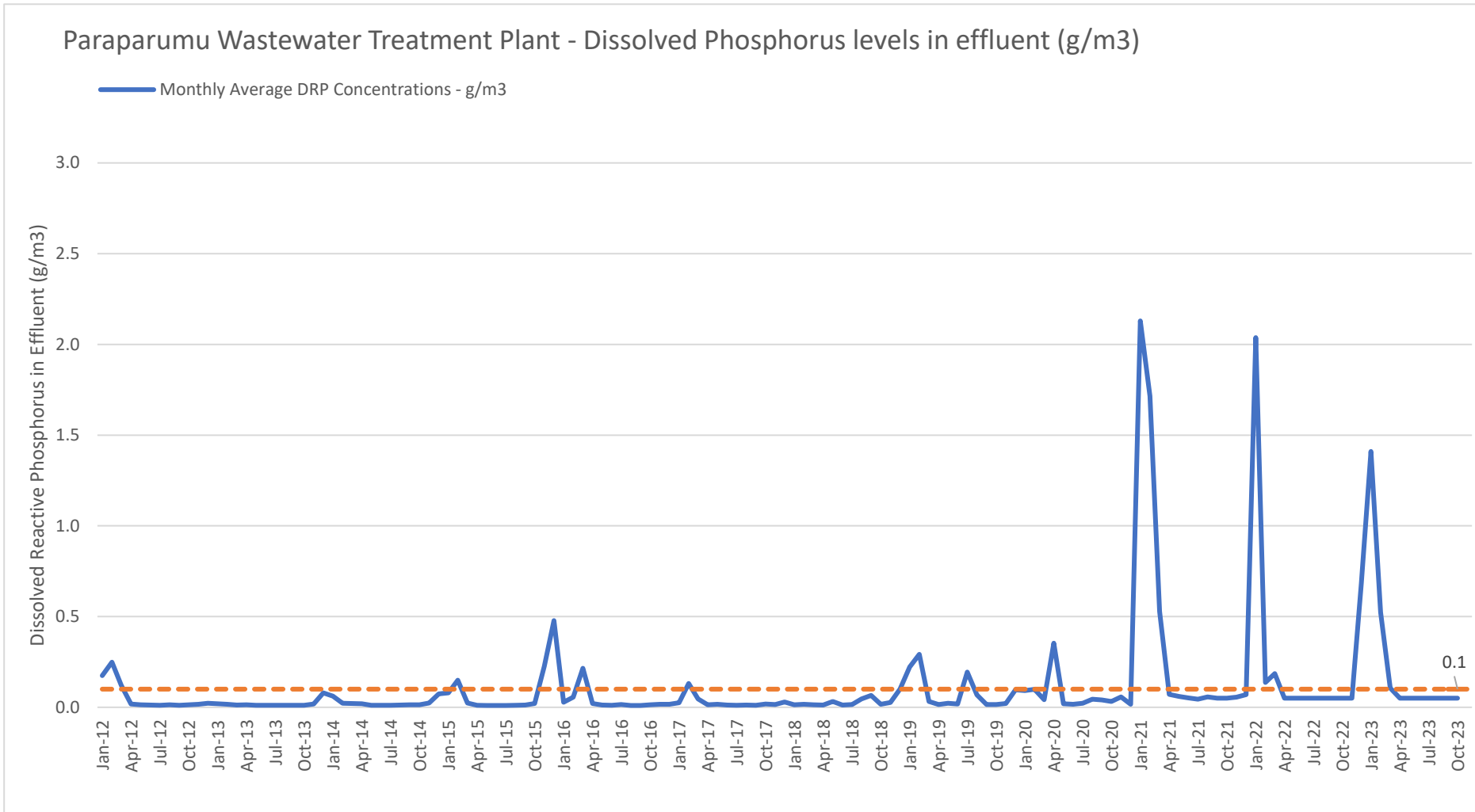
The following pages show how the plant performed from 2012 to date against the consent conditions.

Dissolved Oxygen - WGN970255 Condition 18e - No more than 3 samples of 36 shall fall below 5 parts per million.



Dissolved oxygen (DO) refers to the concentration of oxygen gas incorporated in water.

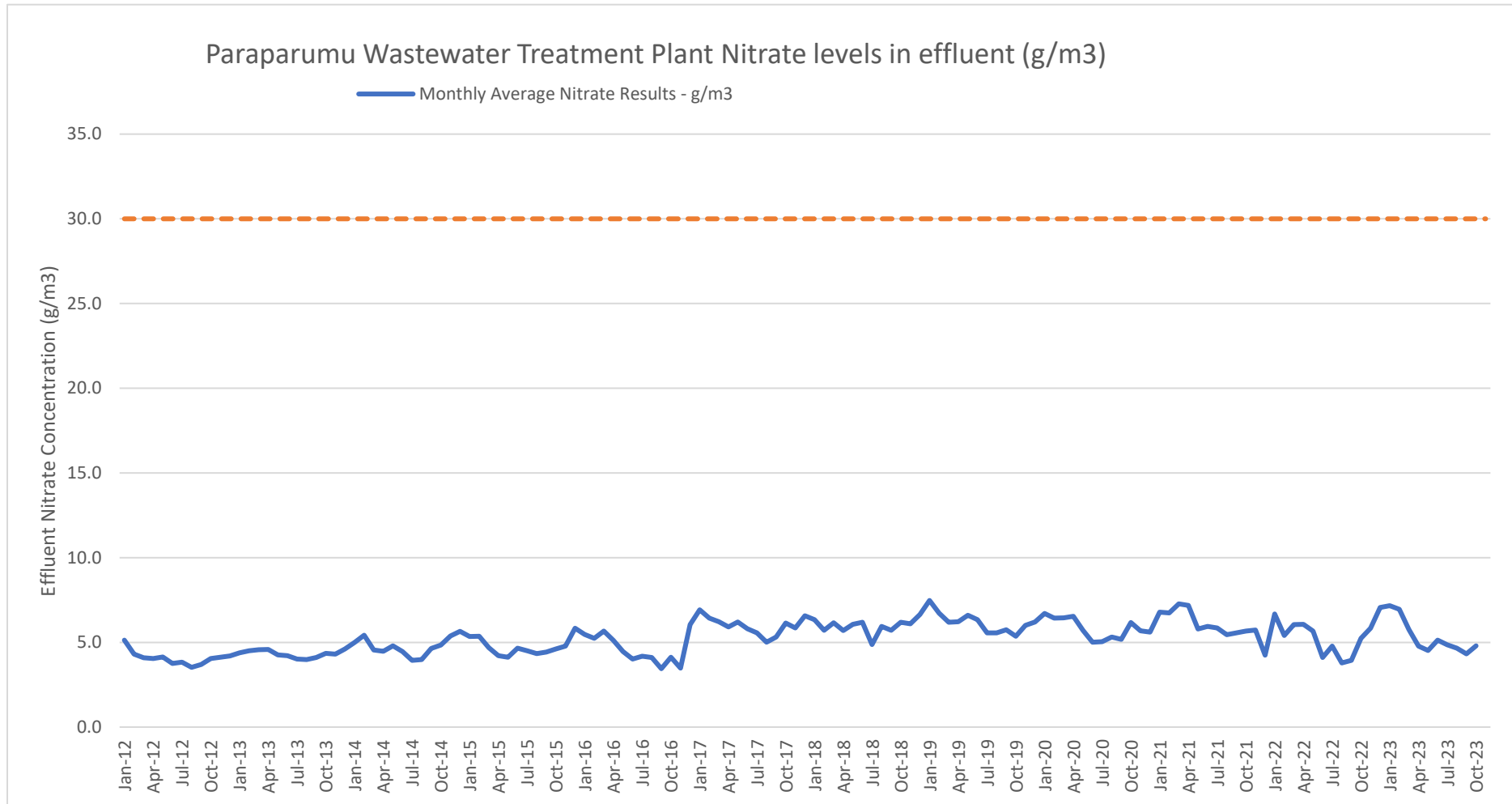
Dissolved Reactive Phosphorus (DRP) - WGN970255 Condition 18c - Council shall sample 6 samples per month for dissolved reactive phosphorus (no consent limit). The consent currently does not have a DRP limit.



Excessive phosphorus in the Mazengarb can cause explosive growth of aquatic plants and algae. This can lead to a variety of water-quality problems, including low dissolved oxygen concentrations, which can cause fish kills and harm other aquatic life.

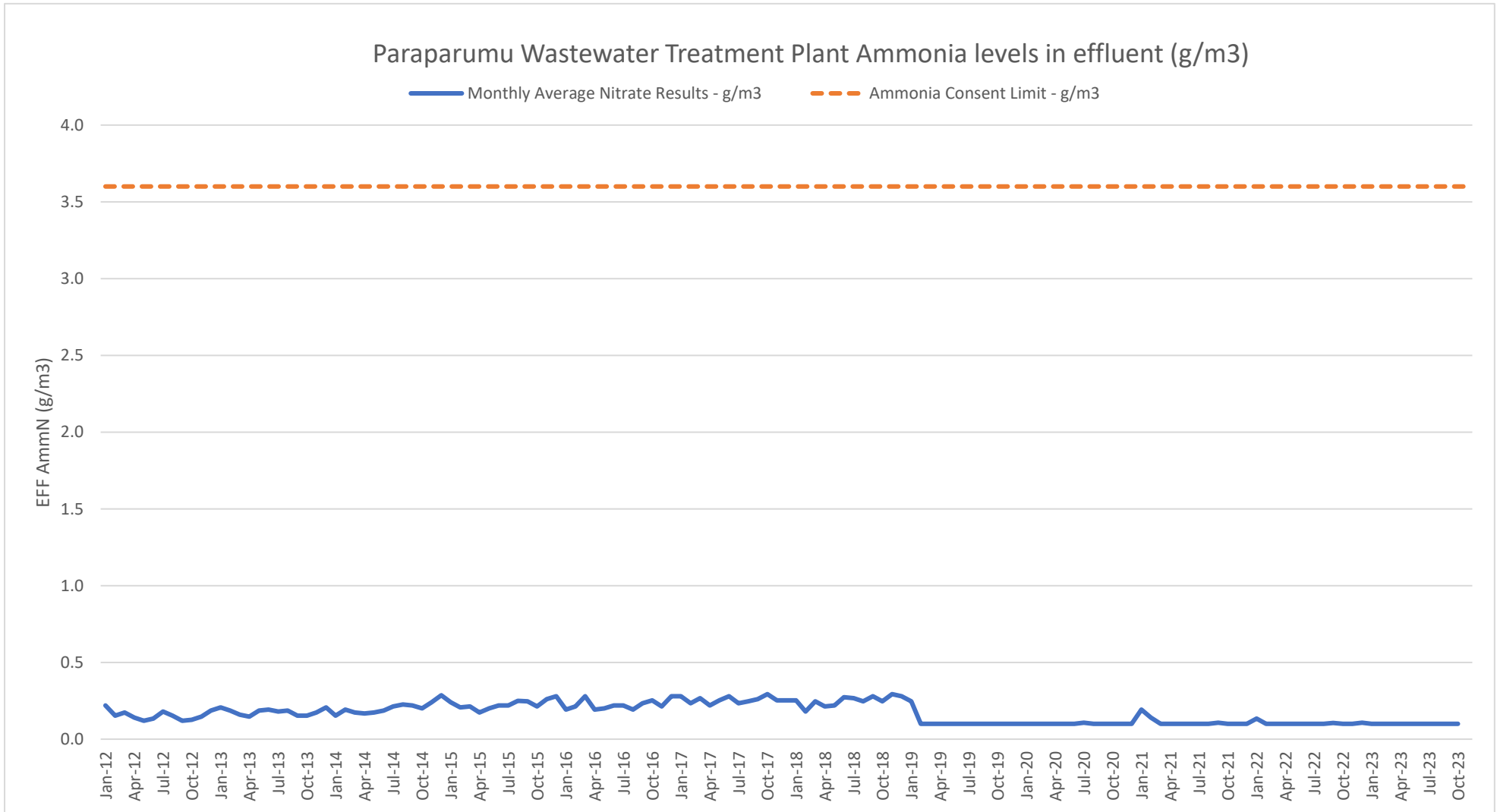
The 0.1 g/m3 limit comes from the WGN160082 consent governing DRP limits in the groundwater down from the Otaki Wastewater Treatment Plant.

Nitrates WGN970255 Condition 18c - No more than 3 effluent samples of 36 consecutive samples shall exceed 3.6 g/m3.



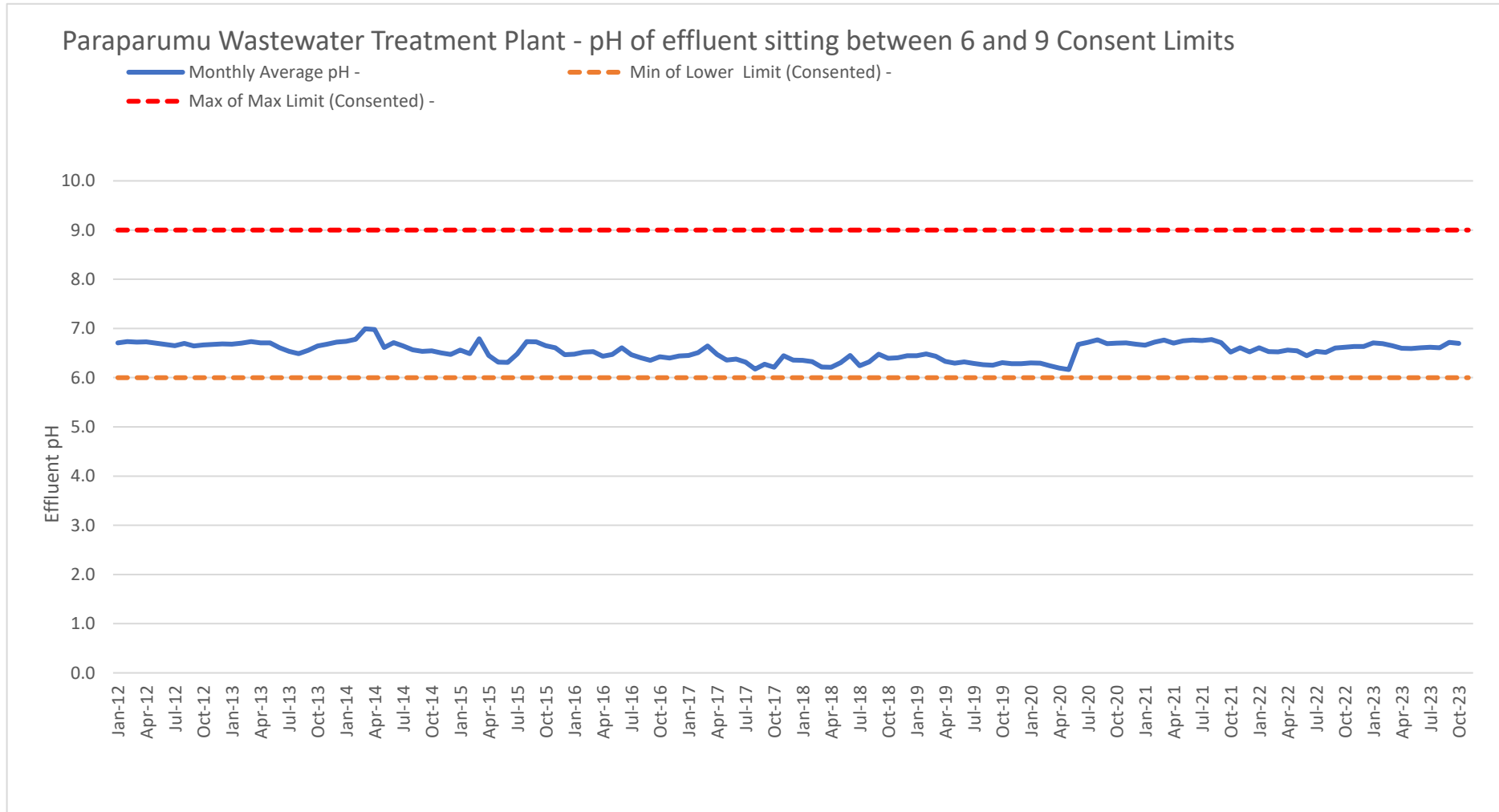
Nitrates are essential plant nutrients, but in excess amounts they can cause significant water quality problems. Together with phosphorus, nitrates in excess amounts can accelerate eutrophication, causing dramatic increases in aquatic plant growth and changes in the types of plants and animals that live in the Mazengarb.

Ammonia - WGN970255 Condition 18c - No more than 3 effluent samples of 36 consecutive samples shall exceed 3.6 g/m3.



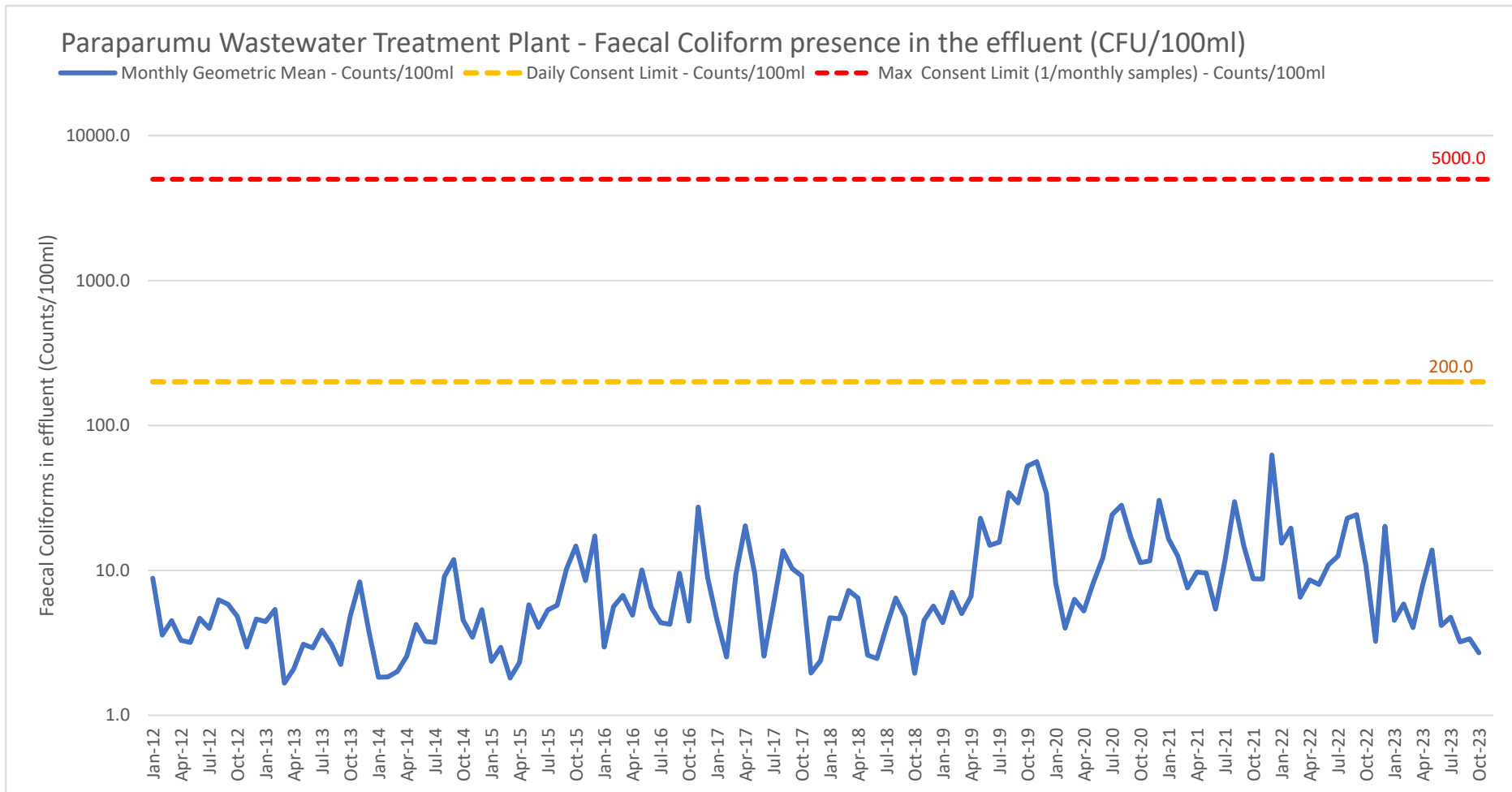
Ammonia is one of several forms of nitrogen that exist in aquatic environments. Unlike other forms of nitrogen, which can cause nutrient over-enrichment of a water body at elevated concentrations and indirect effects on aquatic life, ammonia causes direct toxic effects on aquatic life.

pH - WGN970255 Condition 18b (ii) - Based on at least 12 samples/month, the effluent pH must stay within 6.0 to 9.0.



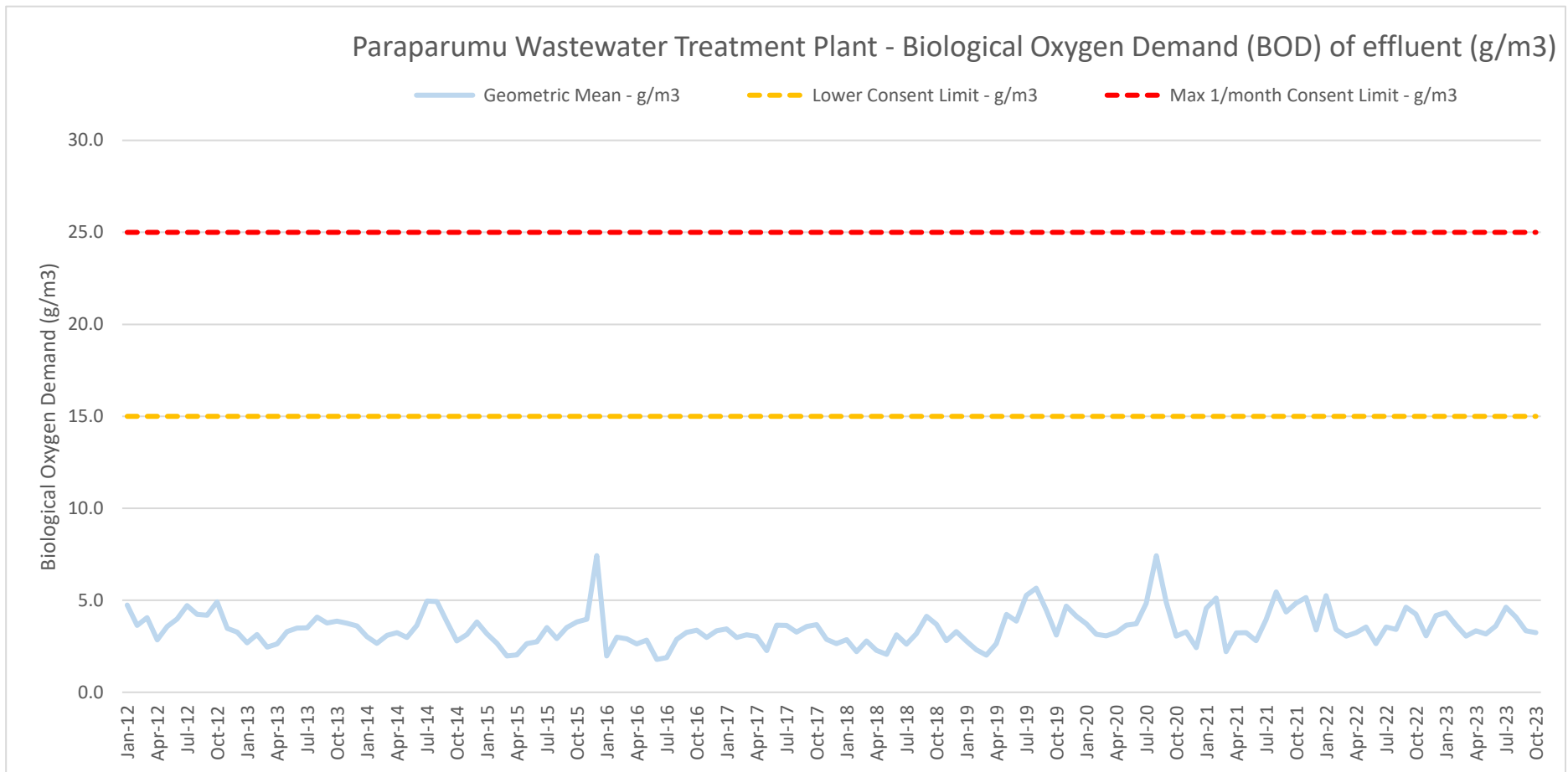
pH affects most chemical and biological processes in water. It is one of the most important environmental factors limiting species distributions in aquatic habitats. Different species flourish within different ranges of pH, with the optima for most aquatic organisms falling between pH 6.5 – 8.

Faecal Coliforms - WGN970255 Condition 18b (i) - Based on at least 12 samples/month, the geometric mean cannot exceed 200 CFU/100ml and no more than one sample of the 12/month can exceed 5,000 CFU/100ml.



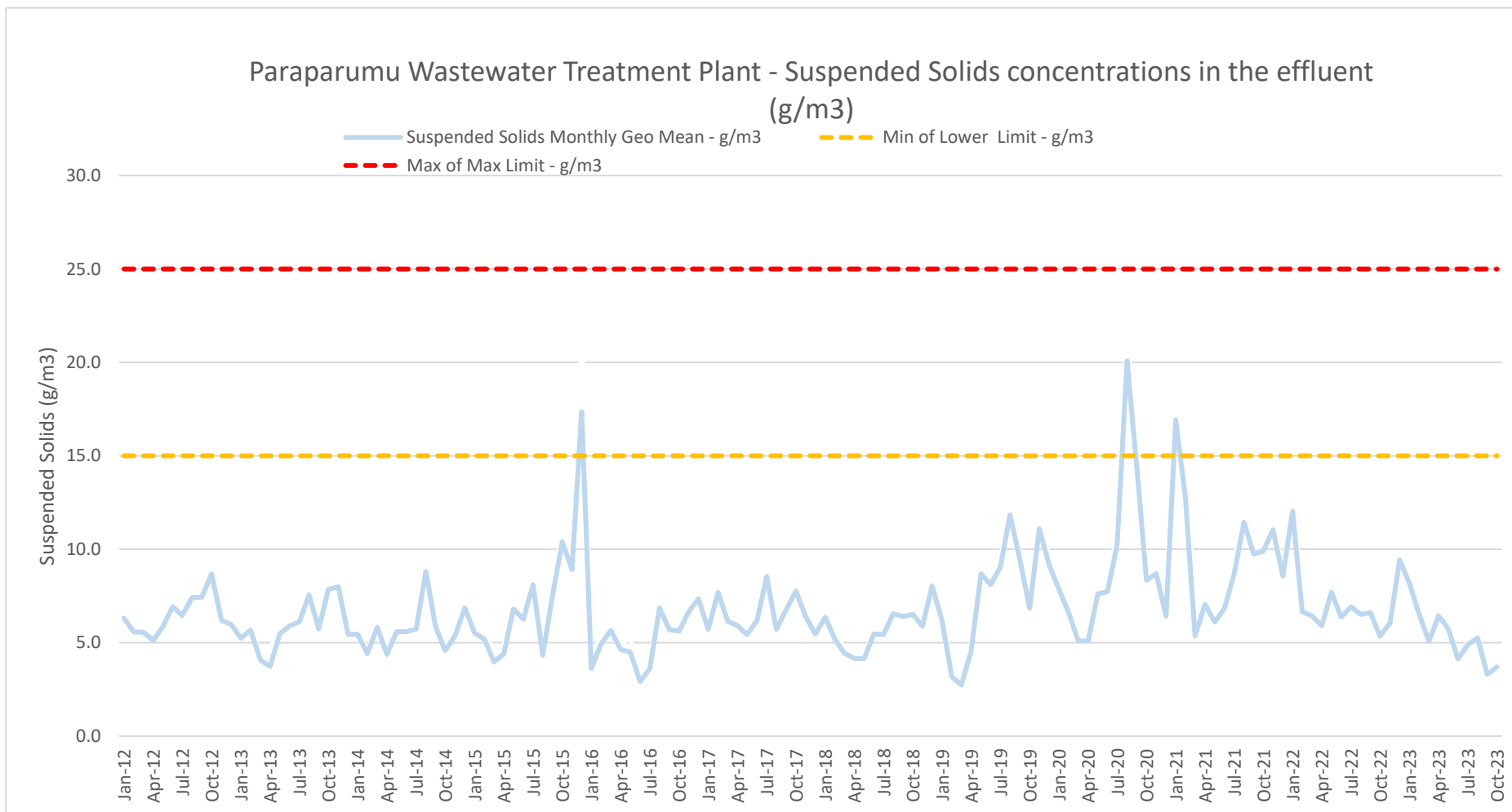
Faecal Coliforms are an indicator of potential water borne diseases. The PWWTP UV system provides an effective treatment for keeping the effluent compliant.

Biological Oxygen Demand - WGN970255 Condition 18a (i) - Based on at least 12 samples/month, the geometric mean cannot exceed 15 grams/m³ and no more than one sample of the 12/month can exceed 25 grams/m³.



BOD directly affects the amount of dissolved oxygen in rivers and streams. The greater the BOD, the more rapidly oxygen is depleted in the stream. This means less oxygen is available to higher forms of aquatic life.

Suspended Solids - WGN970255 Condition 18a (ii) - Based on at least 12 samples/month, the geometric mean cannot exceed 15 grams/m³ and no more than one sample of the 12/month can exceed 25 grams/m³.



High Suspended Solids (SS) may decrease water's natural dissolved oxygen levels and increase water temperature.

Result Summary "Are the Total and Dissolved metals below the Recreational and / or the Drinking Water Guidelines Maximum" - Yes / No												
Element	Arsenic		Boron		Cadmium		Chromium		Copper		Iron	
Sample Type	Effluent		Effluent		Effluent		Effluent		Effluent		Effluent	
	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Below Recreational Guidelines Yes / No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Below Drinking Water MAV's Yes / No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Result Summary "Are the Total and Dissolved metals below the Recreational and / or the Drinking Water Guidelines Maximum" - Yes / No										
Element	Lead		Manganese		Mercury		Nickel		Zinc	
Sample Type	Effluent		Effluent		Effluent		Effluent		Effluent	
	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Below Recreational Guidelines Yes / No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Below Drinking Water MAV's Yes / No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Metals - WGN970255 Condition 18e - Based on at least 1 sample per month, the effluent must meet the consent limits for each metal. From October 2021, the Council monitored the metals weekly. The table shows if the samples met the consent and drinking water standards from 2021-2023.