

5.7. WATER AND WASTEWATER QUARTERLY REPORT JANUARY - MARCH 2022

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DEPARTMENT	Water and Wastewater

RECOMMENDATION

That Council receives and notes the progress of the Quarterly Report of the Water and Wastewater department for the period ending 31 March 2022.

EXECUTIVE SUMMARY

This report documents progress on key operational and service delivery areas as well as the Regulatory compliance status within the Water and Wastewater department for the period 1 January 2022 to 31 March 2022.

Whilst the results are generally positive the areas for improvement are noted and will be the focus of the department over the next quarter.

BACKGROUND

This report is the January – March Quarterly Report submitted by the Water and Wastewater department during the 2021/2022 Financial Year. This report highlights progress against key performance areas required by the Department of Regional Development, Manufacturing and Water (DRDMW) and required compliance levels by the Department of Environment and Science (DES).

COMMENT

This report enables Councillors and the community to obtain a strategic view of activities within the Water and Wastewater department.

The Quarterly Report documents progress on key operational and service delivery aspects and regulatory compliance levels.

The Water and Wastewater Quarterly Report does not include comprehensive progress reporting in terms of the Capital Works Programs, Operational Plan and financial statements as these are dealt with in separate Quarterly Reports to Council.

FINANCIAL/RESOURCE IMPLICATIONS

Failure to comply with required standards and to respond quickly and effectively to water and wastewater incidents may result in harm to the community and substantial penalties.

RISK MANAGEMENT IMPLICATIONS

Council as a registered water service provider has a statutory obligation to ensure it is able to provide water and wastewater services to customers. Council's reputation would suffer if it is unable to maintain service levels at prescribed standards.

This Quarterly Water and Wastewater report provides information on strategies implemented by the Water and Wastewater department to minimise occupational health and safety risks and risks to Council infrastructure.

SUSTAINABILITY IMPLICATIONS

Economic:	It is essential to adequately maintain water and wastewater infrastructure in order to provide satisfactory services in support of economic development in the Shire.
Environmental:	Failing to provide adequate and compliant water and wastewater services can lead to environmental harm and breaching of licence conditions.
Social:	The Community expects fully operational and compliant water and wastewater services.

CORPORATE/OPERATIONAL PLAN, POLICY REFERENCE

This report has been prepared in accordance with the following:

Corporate Plan 2019-2024 Initiatives:

Theme 3 - Leading Environmental Stewardship

Our visitors and residents deeply value the unparalleled environment in which we live. We recognize our responsibility in protecting and preserving our natural world for generations to come.

We understand the strong link between the environment and the economy: they are interdependent. Douglas Shire will be at the forefront of environmental protection by developing strategies, setting policies, and working with all stakeholders to become the envy of and to inspire locations across Australia and the World.

Goal 2 - *We will implement programs that reduce and offset our environmental footprint.*

Goal 3 - *We will continue to build water infrastructure so that the Douglas Shire may enjoy water security and water quality.*

Goal 4 - *We will partner with the community to educate and monitor.*

Theme 5 - Robust Governance and Efficient Service Delivery

Strong governance and financial management are the foundations of the way in which Council will conduct its business and implement the initiatives of the Corporate Plan.

Goal 3 - *We will make sound financial decisions by ensuring robust strategic planning, financial management and reporting.*

Goal 4 – *We will work with our communities to ensure they are informed, empowered and supported so that they are resilient to the impacts of disaster events. Through our leadership and capabilities we will plan, prepare, respond and recover from events so as to minimise the impact on people, property, the environment, and our economic stability.*

Operational Plan 2021-2022 Actions:

3.3.1 – Progress future water security infrastructure solution for secure water supply over the dry season to alleviate current and future water shortages. Perform feasibility analysis on all current proposed water security solutions including the alternate intake and bulk raw water storage solutions to determine most viable option that provides the best outcome for capital investment and water security then progress towards shovel ready stage.

3.3.2 – Continue the rollout of smart water meters to move beyond Port Douglas and include Mossman and surrounding area.

3.4.2 - Grow the water education program through primarily schools and community groups to engender a greater knowledge of the water cycle and water security within Douglas.

COUNCIL'S ROLE

Council can play a number of different roles in certain circumstances and it is important to be clear about which role is appropriate for a specific purpose or circumstance. The implementation of actions will be a collective effort and Council's involvement will vary from information only through to full responsibility for delivery.

The following areas outline where Council has a clear responsibility to act:

Builder/Owner	Council makes a significant investment every year in the infrastructure that underpins the Shire through its capital works program. Council will manage its assets with appropriate frameworks and deliver its projects through robust project management.
Regulator	Council has a number of statutory obligations detailed in numerous regulations and legislative Acts. Council also makes local laws to ensure that the Shire is well governed. In fulfilling its role as regulator, Council will utilise an outcomes based approach that balances the needs of the community with social and natural justice.

CONSULTATION

Internal:	Nil
External:	Water and wastewater quality parameters are tested by an accredited laboratory and test results and service levels are required to be reported to the Department of Regional Development, Manufacturing and Water and the Department of Environment and Science.
Community:	Nil

ATTACHMENTS

1. Water and Wastewater Quarterly Report for the period ending 31 March 2022 [5.7.1 - 25 pages]

1 January to 31 March 2022

The aim of the Water and Wastewater Quarterly Report is to inform Councillors and the community on the progress of key operational and service delivery areas as well as regulatory compliance status within the Water and Wastewater Department.

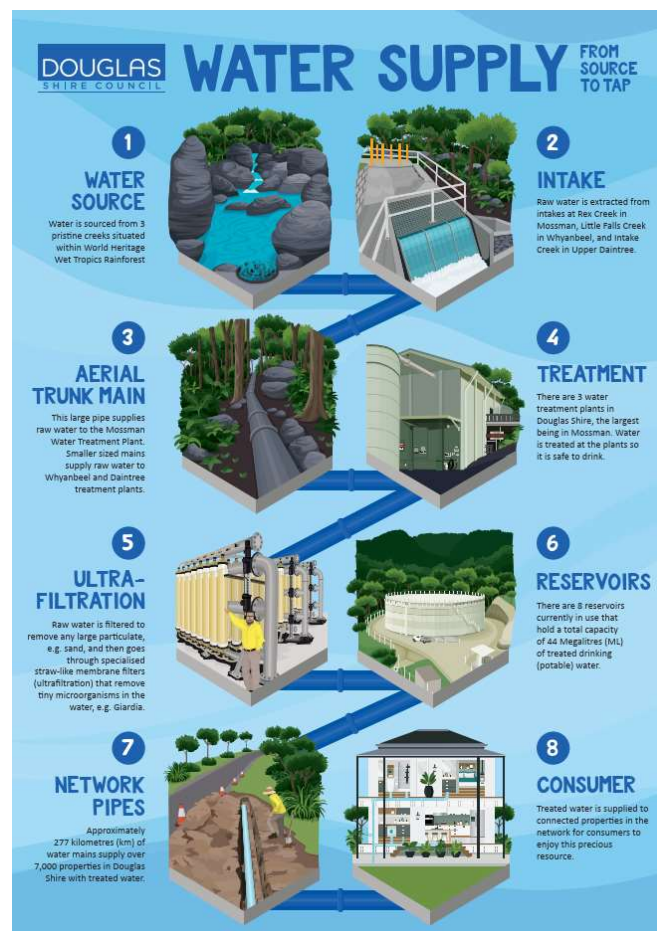
The Water and Wastewater quarterly report does not include comprehensive progress reporting in terms of Capital Works or Operational Plan; these are dealt with in separate quarterly reports to Council.

This report highlights certain aspects of the activities of the Water and Wastewater Department that are industry benchmark indicators as well as key performance areas and compliance monitoring parameters as required by the Department of Regional Development, Manufacturing and Water (DRDMW) and the Department of Environment and Science (DES).

Water

1. Water Education

A Water Supply poster specifically designed with Douglas Shire Council infrastructure artwork has been completed (see image below):



The poster will be provided to schools and displayed in various locations throughout the Shire to assist in showing how potable water is supplied to consumers. The artwork on the poster is also planned to be posted on the council website with expanded information for each stage of supply to further support how water is treated and supplied. The target audience is school-age children but is also suitable for adults. In addition, work on the Wastewater Treatment poster has commenced.

Work has continued to progress on the development of a Water Education Program which is being designed to align with the national curriculum. The Australian Curriculum is currently in the process of being reviewed and is planned to be endorsed and published later in the year, with a transition between the existing and latest versions expected to occur over the next few years.

2. Water reticulation services

General maintenance was carried out during the reporting period on all schemes, including on all intake valves. Reservoirs and pump stations were regularly inspected while flushing programs were completed on an 'as needed' basis to keep chlorine residuals within the acceptable limits.

There were 29 new water service renewals and 242 DBYD in this reporting period. Water service renewals are replacing water services which have reached their life expectancy and are at risk of failing.

Providing DBYD service locations on council infrastructure assists in preventing damage and disruption to water, sewer and drainage services within the Douglas Shire. Water flushing programs were implemented due to the maintenance and functionality of hydrants, maintaining water quality that relates to aesthetic parameters and for maintaining acceptable chlorine residuals within the schemes. Response/reaction time for all water reticulation incidents was within the customer service standards. See table 1 showing results on water reticulation maintenance activities across all schemes.

Regular reservoir and pump station checks and intake maintenance was performed on all three schemes.

Table 1. Water reticulation services maintenance activities undertaken across all schemes

Douglas Shire Reticulation (all schemes)	
Settlement Meter Reads	250
New Water Services Connections	33
Service Repairs	154
Water Mains Repairs	21
Water service renewals	29
Water Quality Notifications (Complaints)	4(0)
Dial before you dig	242
Flushing Events: Mossman/Port Douglas/Cooya/ Newell	11

Flushing Events: Whyanbeel/Wonga	11
Flushing Events: Daintree	15
Water meter leg replacements for smart water meter program	300

There were four water quality notifications during this reporting period. The staff investigated each situation, tested the water, and flushed water main where necessary. The results indicated that the water quality at each circumstance was within the Australian Drinking Water guidelines. All water quality notifications/complaints were handled under customer service standards. Water and Wastewater team views all water quality notifications and complaints seriously and endeavours to achieve outcomes where customer satisfaction is priority.

In this quarter, the Smart Water Meter project progressed to the installation phase on 28 March 2022 with contractors installing new automatic master meters as required and retrofit devices for those not due for replacement. The first stage installation works for this project involves approximately 900 meters/retrofit devices and is due to be completed by early April 2022.

To assist with community education about smart water meters, some Frequently Asked Questions (FAQs) were updated and added to Council's website [Smart Water Meter Program - Douglas Shire Council](#).

3. Water schemes and potable water consumption

The Water and Wastewater Department implemented Level 0 water restrictions on 2 December 2021 for all properties using the reticulated water supply within Douglas Shire, which continued for the January – March 2022 reporting period.

The Bureau of Meteorology update on the 2021-22 La Niña event indicates it has past its peak and has returned to neutral El Niño–Southern Oscillation (ENSO) levels. As La Niña weakens, it will continue to influence weather and climate. The recent increase in tropical activity over the north and south Indian Ocean is associated with the presence of the Madden–Julian Oscillation (MJO). As a result, atmospheric conditions across the region remain favourable for enhanced tropical weather. As the MJO and other tropical waves dissipate and move out of the region, conditions are likely to return to near average across the Australian tropics.

However, there is an increased chance of unusually high rainfall for April to June across the northern tropics of Queensland. The latest rainfall outlooks from the Bureau show a greater than 80% likelihood of above-median rainfall for northern Queensland.

The Rex Creek Intake water level declined to 510mm in the first week of January, however bursts of rainfall events since then increased the level with the highest rainfall event occurred on 12 January 2022 raising Rex Creek intake to 850mm. Level 0 community water conservation measures continued to promote water wise behaviour during the quarter, but with much less restriction on use.



Images: Rex creek intake – 15 March 2022 intake levels showing good levels.

All intakes and reservoirs had adequate water supply during the reporting period, all water treatment plants met all demand requirements and performed well with no incidents.

The average water consumption for the months from October to December was 8.179 ML/day for the Port Douglas network and 2.573 ML/day for the Mossman network. The graph below displays the total water use between Mossman and Port Douglas networks and Rex Creek intake level during the reporting period.

The Figure 1 displays the comparison use between Mossman and Port Douglas treated water supply and Rex Creek intake levels.

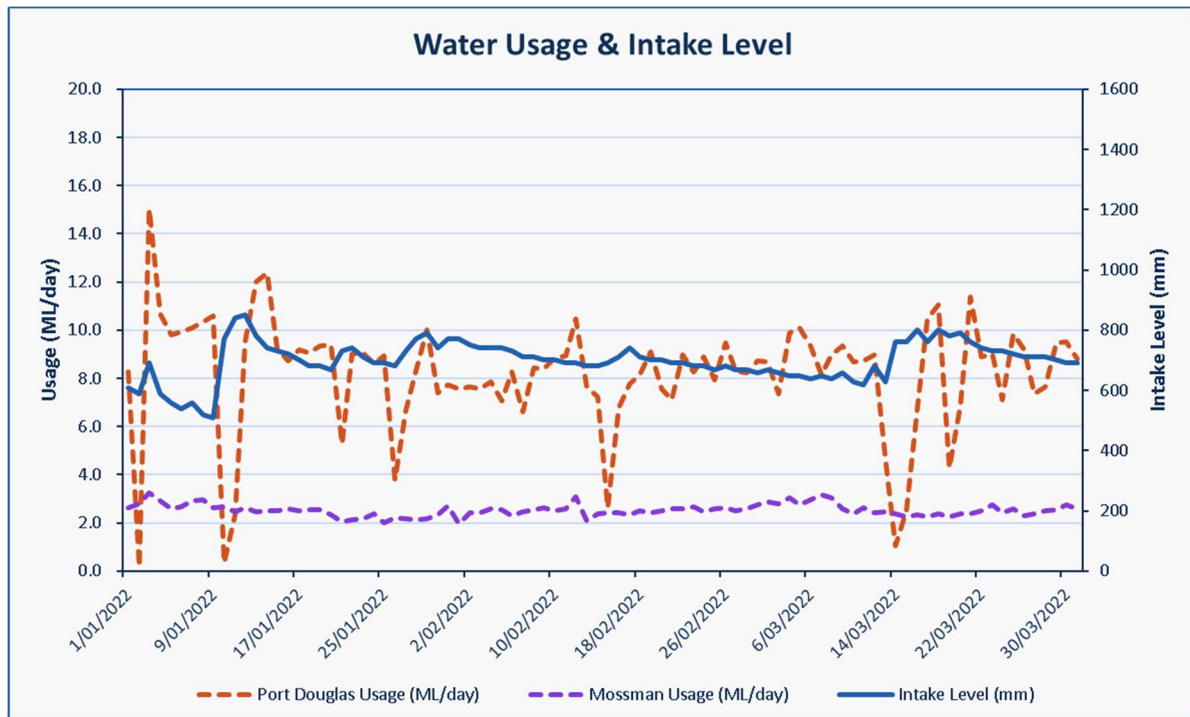


Fig 1. Mossman and Port Douglas water usage and Rex Creek intake levels for the period 1 January to 31 March 2022

4. All Schemes

Water quality operations within all schemes have been performing well throughout this reporting period although raw water turbidity during wet weather events has caused some water treatment plant shutdowns. All water scheme pump stations performed well with no incidents.

General maintenance was carried out during the reporting period on all schemes, including on all intake valves. Reservoirs and pump stations were regularly inspected while flushing programs were completed on an 'as needed' basis to keep chlorine residuals within the acceptable limits.

Mossman/Port Douglas Scheme

All operations were undertaken as well as all general service works, routine inspections and maintenance within the Mossman/Port Douglas Scheme. Mossman water treatment plant met all consumer demand requirements throughout this reporting period.

A contractor has been recommissioning the Craiglie Reservoir electrochlorination system to assess the functionality of the chlorination system in all scenarios, including during mains break situations and extended storage periods. During the reporting period, Craiglie reservoir was used as a supplementary supply via Crees Rd Reservoir which re-chlorinates the water to the required level prior to distribution. Until the functionality of the chlorination system is resolved to allow for direct distribution, Craiglie reservoir can continue to be used as supplementary supply via Crees Rd Reservoir.

There were no water quality reportable incidents in the Mossman water scheme within this reporting period. High water levels were maintained in all reservoirs in the Mossman/Port Douglas Scheme. Operational SCADA processes were assessed to determine if current water operator actions are appropriate.

Mossman Water Supply

The total monthly consumption of water in Mossman, Cooya Beach and Newell Beach areas can be seen in Figure 2. Elevated consumption in September and October 2021 was due to a main break that resulted to a need to transfer treated water from the Mossman reservoir to both networks in Port Douglas and Mossman. Due to this, all water consumption was monitored through Mossman flow meter.

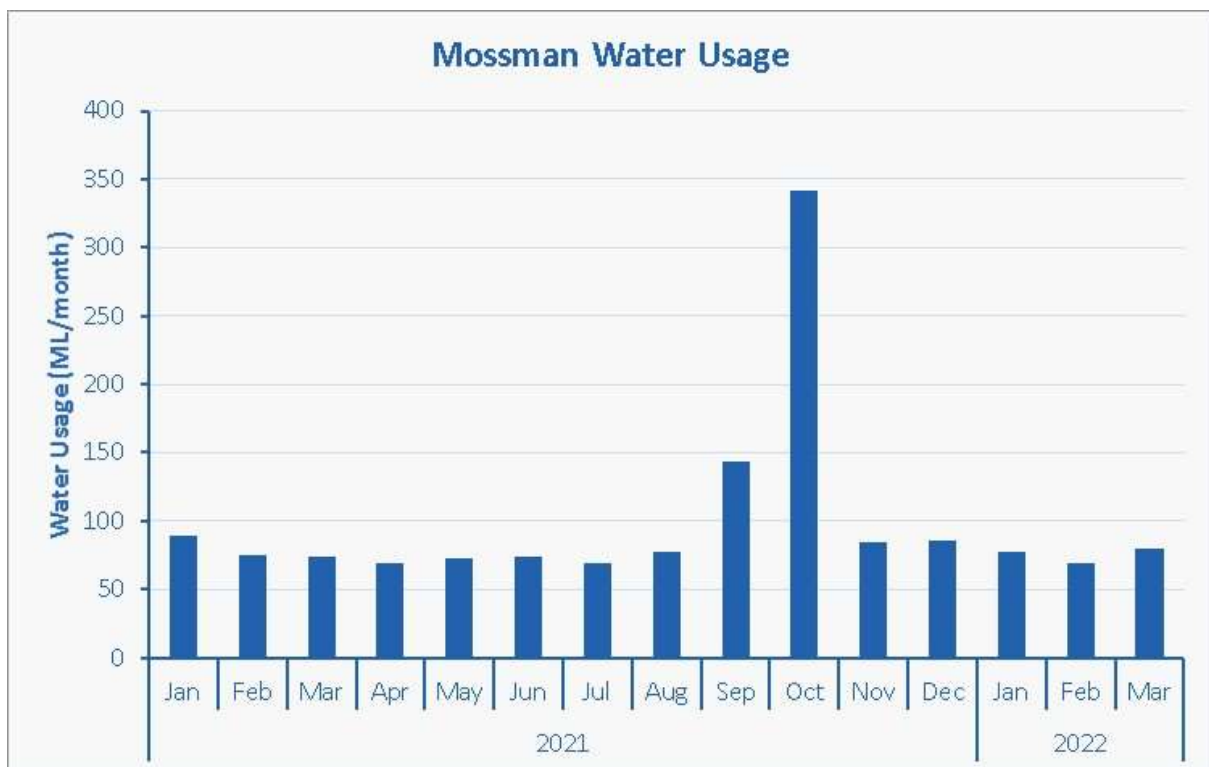


Fig 2. Mossman Scheme Total Monthly Consumption Figures

Port Douglas Water Supply

The total monthly consumption of water in Port Douglas, Craiglie and Mowbray areas can be seen in Figure 3. Reduced consumption in September and October 2021 was due to a main break that resulted to a need to transfer treated water from the Mossman reservoir to both networks in Port Douglas and Mossman.

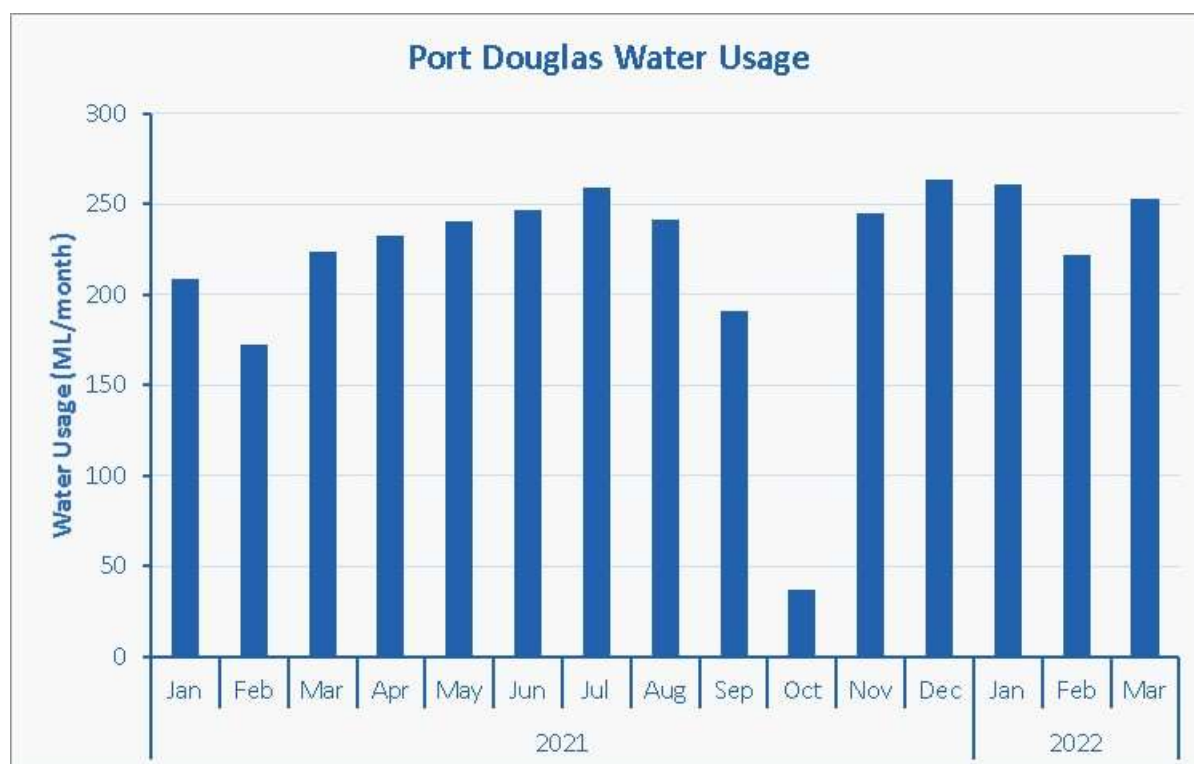


Fig 3. Port Douglas Scheme Total Monthly Consumption Figures

Whyanbeel Scheme

Whyanbeel Water Treatment Plant met all demand requirements during the reporting period. There were no water quality reportable incidents in the Whyanbeel water scheme for the reporting period. CIP filter maintenance was carried out at the Whyanbeel and Mossman Treatment Plants.

The total monthly consumption of water in Whyanbeel, Wonga Beach, Miallo, Rocky Point, Syndicate and Bamboo can be seen in Figure 4.

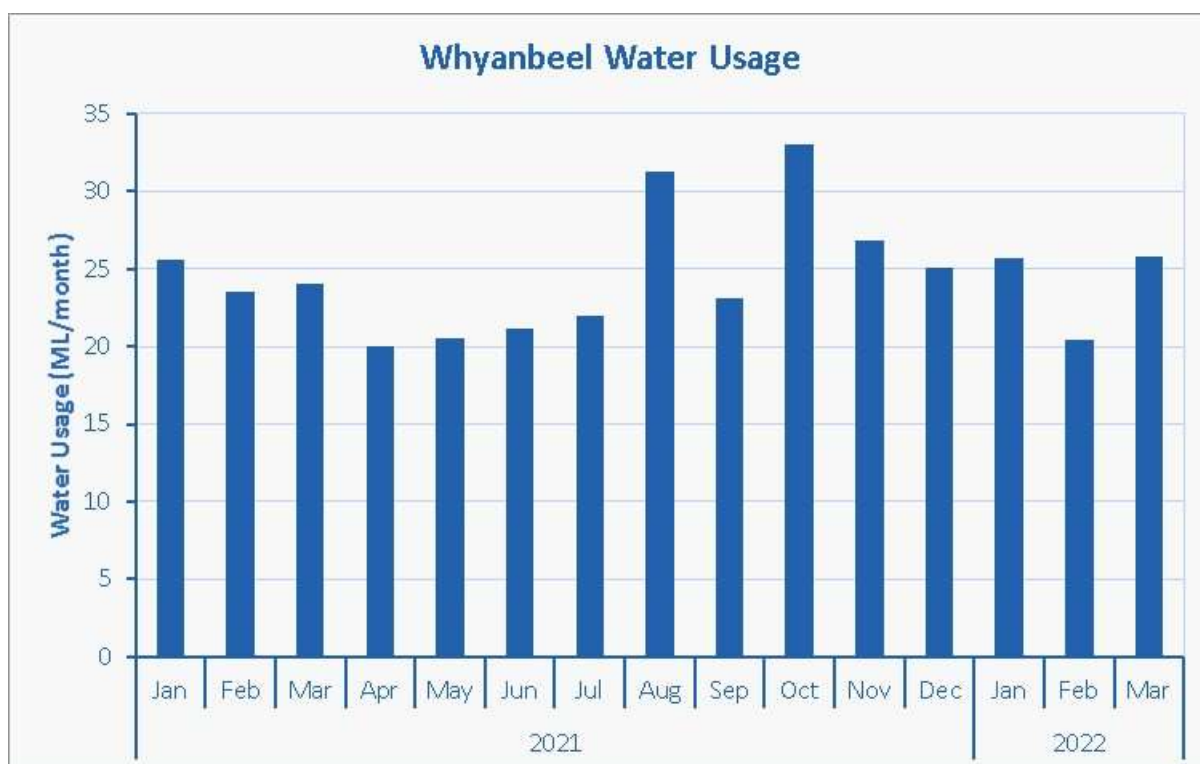


Fig 4. Whyanbeel Scheme Total Monthly Consumption Figures

Daintree Scheme

Daintree Water Treatment Plant met all demand requirements during the reporting period.

To maintain UF filter efficiency, chemical CIP operations were undertaken together with general service and maintenance works.

There were no water quality reportable incidents in the Daintree water scheme for the reporting period.

The total monthly consumption of water in Daintree can be seen in Figure 5.

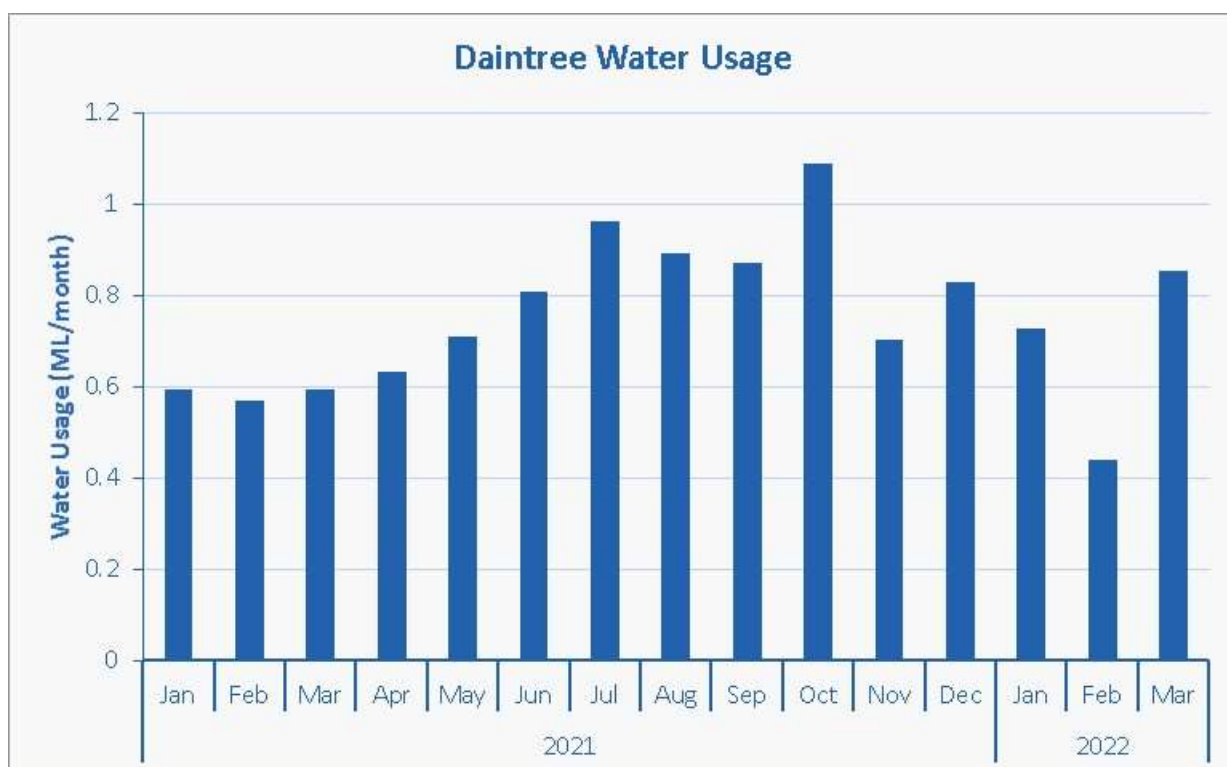


Fig 5. Daintree Scheme Total Monthly Consumption Figures

5. Water quality monitoring and results

Drinking water sampling occurs at intakes, reservoirs and in the reticulation network to ensure compliance with the ADWG.

Water quality verification monitoring includes regular testing of individual reticulation zones with monthly sampling at the reservoirs. Supporting programs for the verification of drinking water quality include:

- Water treatment plants and reservoirs that have SCADA alarms for action and critical limits and are operated under critical control points;
- Reservoir inspections that are done regularly to ensure that the reservoirs are intact and that any points of ingress are repaired; and,
- Network operations that have a flushing program that ensures the chlorine residual is above 0.2 mg/L.

For the reporting period, a total of 84 treated water E.Coli compliance samples were taken in the three drinking water schemes. A total of 42 E.Coli samples were tested in the Douglas water laboratory and 42 in a NATA accredited laboratory. Other parameters monitored allow the Water and Wastewater Department to observe trends in water quality through the schemes.

All tested parameters in drinking water samples during the reporting period were compliant with ADWG health guideline values and standards required by the Water Supply Regulator and Queensland Health.

In addition, raw water quality was monitored at all of the intakes and Daintree Bore site, including 16 raw water E.Coli samples. Raw water sampling assists us to understand the treatment plant needs and the health-based targets.

Mossman/Port Douglas Supply Scheme

Average monthly values for key operational and compliance parameters are detailed in Tables 3 and 4 for treated water at Port Douglas Reservoirs and Port Douglas/Mossman Reticulation network respectively. Figure 6 indicates the daily turbidity trends at the intake and treated water as recorded at the Mossman Water Treatment Plant for the period January to March 2022.

Table 3. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.

Month	pH	Temp °C	Total Alkalinity mg CaCO ₃ /L	Free Cl mg/L	Total Cl mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0 - 200	0.2 - 5.0	0.2 - 5.0	<1
Jan-22	7.4	28.8	9	1.0	1.0	<1
Feb-22	7.4	28.3	9	1.1	1.1	<1
Mar-22	7.6	29.1	10	1.0	1.1	<1

Table 4. Average monthly values for key operational and compliance parameters in the Mossman/Port Douglas Reticulation Network.

Month	pH	Temp °C	Free Cl mg/L	Total Cl mg/L	Colour PCU	Cu mg/L	Fe mg/L	Mn mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0.2 - 5.0	0.2 - 5.0	<15	<1	<0.3	<0.1	<1
Jan-22	7.0	29.1	0.5	0.6	<1	0.014	0.027	0.0002	<1
Feb-22	7.1	28.6	0.6	0.7	<1	0.015	0.010	<0.0002	<1
Mar-22	7.3	29.4	0.6	0.7	<1	0.009	0.005	<0.0002	<1

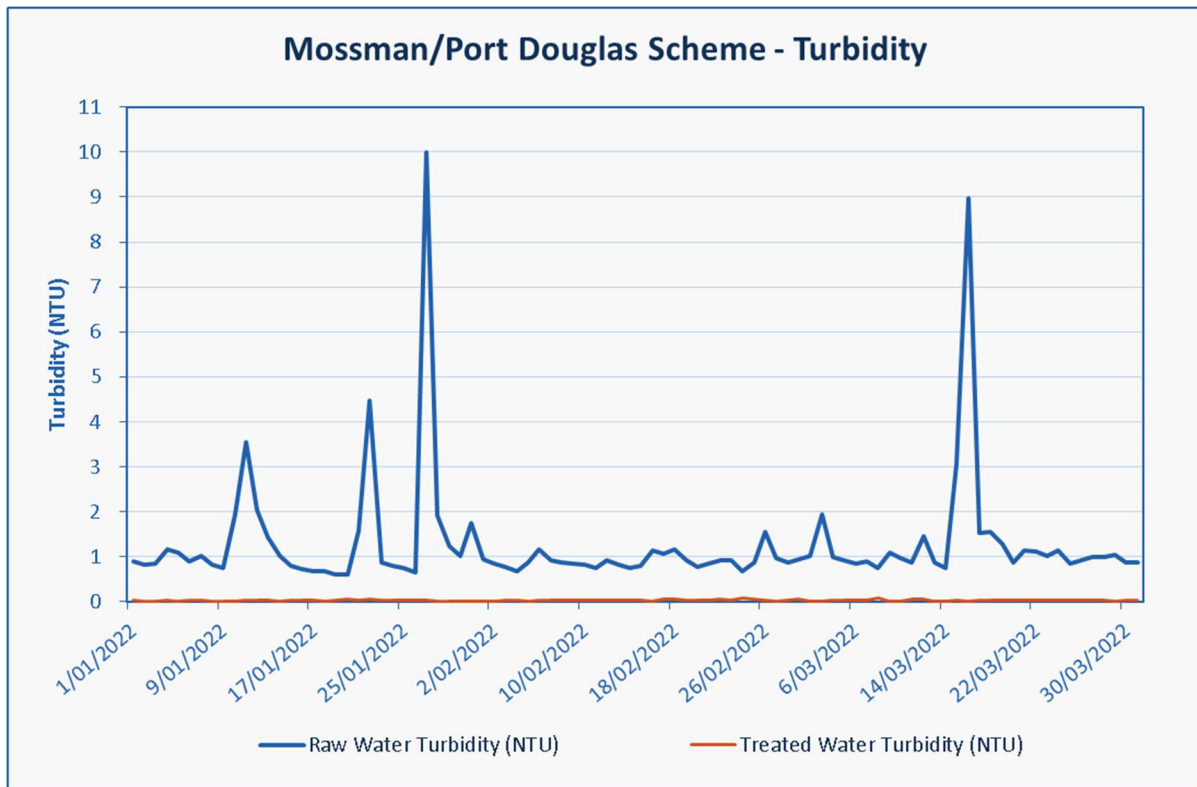


Fig 6. Turbidity trends at the Rex Creek intake and treated water at the Mossman Water Treatment Plant

Whyanbeel Supply Scheme

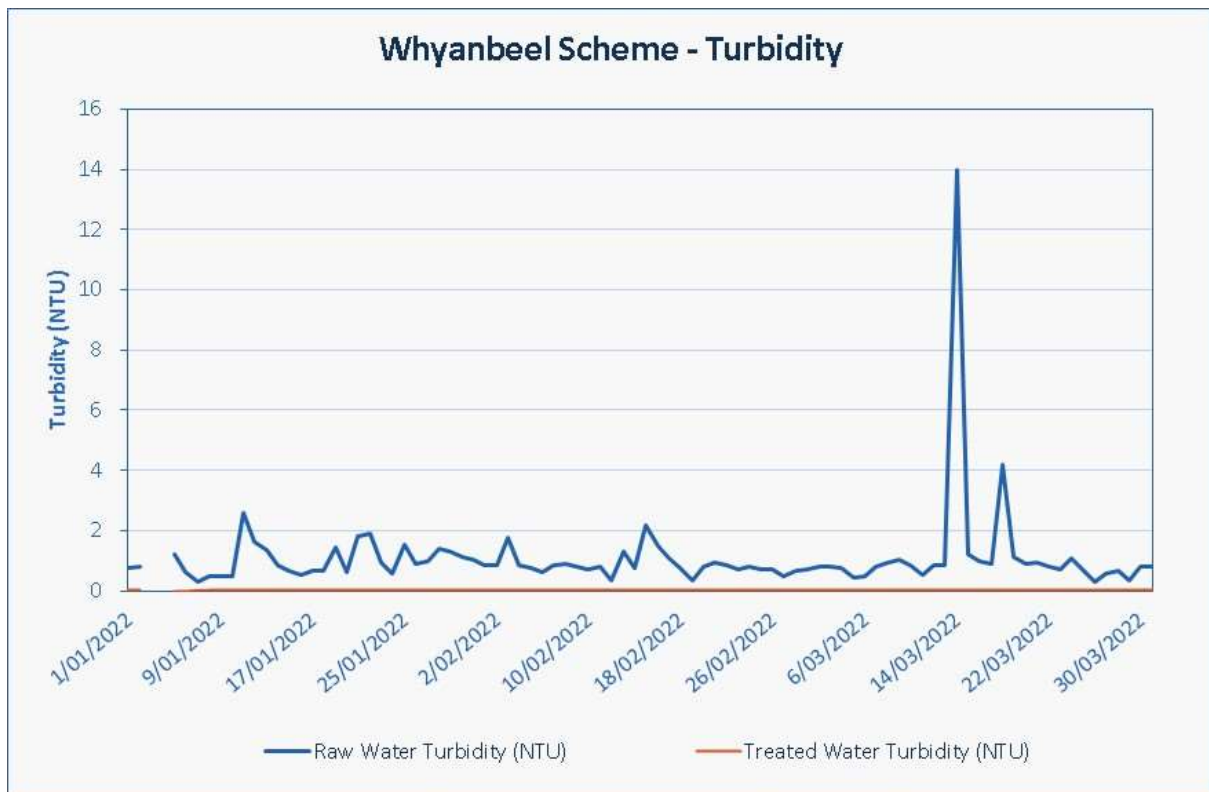
Average monthly values for key operational and compliance parameters are detailed in Tables 5 and 6 for treated water at the Whyanbeel Reservoir and Whyanbeel Reticulation Network respectively. Figure 7 indicates the daily turbidity trends at the intake and treated water as recorded at the Whyanbeel Water Treatment Plant for the period January to March 2022.

Table 5. Average monthly values for key operational and compliance parameters in the Whyanbeel Reservoir.

Month	pH	Temp °C	Total Alkalinity mg CaCO ₃ /L	Free Cl mg/L	Total Cl mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0 - 200	0.2 - 5.0	0.2 - 5.0	<1
Jan-22	8.1	29.1	13	1.0	1.1	<1
Feb-22	8.3	28.7	13	1.0	1.1	<1
Mar-22	8.3	28.4	11	0.8	0.8	<1

Table 6. Average monthly values for key operational and compliance parameters in the Whyanbeel Reticulation Network.

Month	pH	Temp °C	Free Cl mg/L	Total Cl mg/L	Colour PCU	Cu mg/L	Fe mg/L	Mn mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0.2 - 5.0	0.2 - 5.0	<15	<1	<0.3	<0.1	<1
Jan-22	7.8	28.1	0.7	0.8	<1	0.007	<0.015	<0.0002	<1
Feb-22	8.0	28.2	0.8	0.8	<1	0.006	<0.015	<0.0002	<1
Mar-22	7.9	29.2	0.9	0.9	<1	0.006	<0.015	<0.0002	<1

**Fig 7. Turbidity trends at the Little Falls Creek intake and treated water at the Whyanbeel Water Treatment Plant.**

Daintree Supply Scheme

Average monthly values for key operational and compliance parameters are detailed in Table 7 for treated water at Daintree Reticulation network. Figure 8 indicates the daily turbidity trends at the intake and treated water as recorded at the Daintree water treatment plant for the period January to March 2022.

Table 7. Average monthly values for key operational and compliance parameters in the Daintree Reticulation Network.

Month	pH	Temp °C	Free Cl mg/L	Total Cl mg/L	Colour PCU	Cu mg/L	Fe mg/L	Mn mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0.2 - 5.0	0.2 - 5.0	<15	<1	<0.3	<0.1	<1
Jan-22	7.7	27.5	0.9	0.9	<1	0.003	<0.015	0.0004	<1
Feb-22	8.0	28.4	0.9	0.9	<1	0.002	<0.015	0.0002	<1
Mar-22	7.9	28.3	0.9	0.9	<1	0.002	<0.015	<0.0002	<1

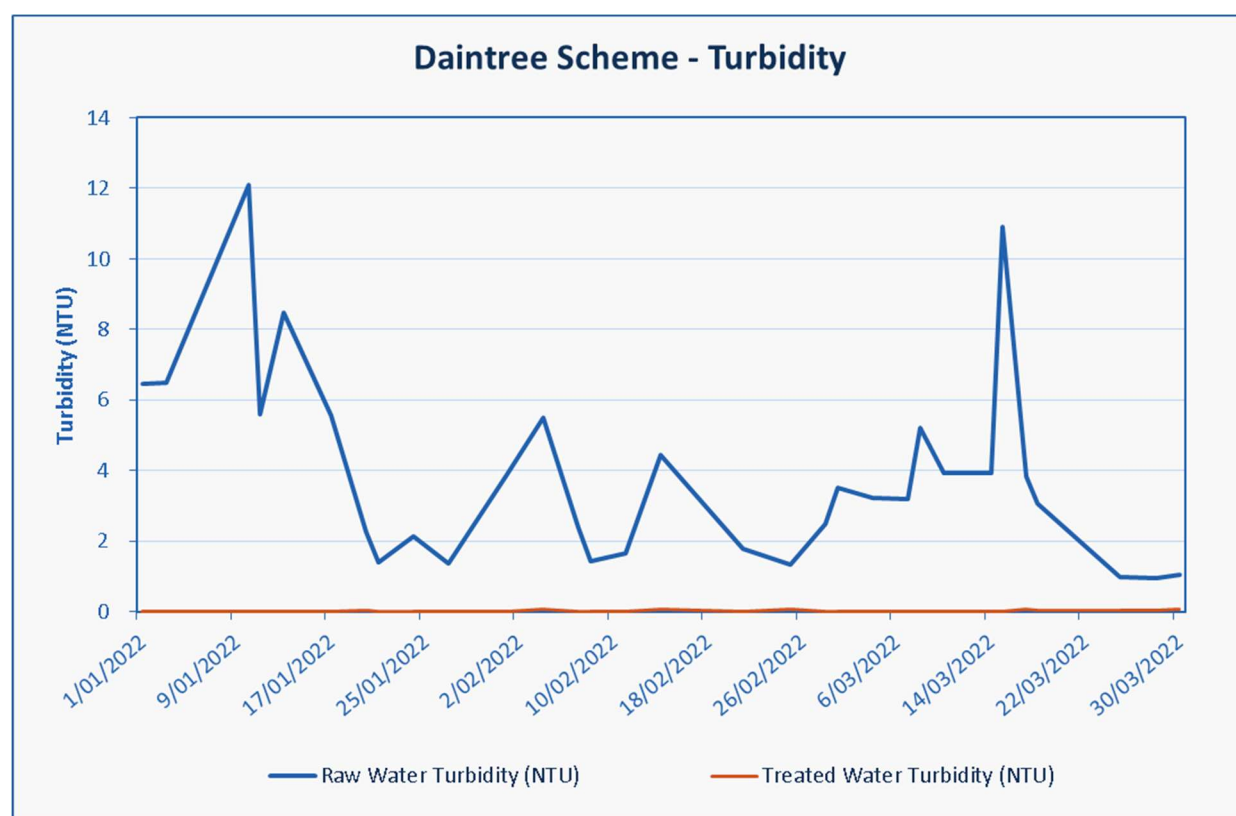


Fig 8. Turbidity trends at the Intake/Martin Creek intake and treated water at the Daintree Water Treatment Plant.

Wastewater

1. Wastewater reticulation services

General maintenance programs continued on the reticulation networks and 32 pump stations in the Mossman and Port Douglas catchments. Wastewater Treatment Plants operated with in license requirements throughout this period.

Capital works programs during the reporting period for the Wastewater Department included:

- Manhole Condition – Refurb Program consisted of 6 badly eroded manholes resealed and painted by contractors.
- The refurbishment of the odour control unit roof was completed in this quarter.
- Wastewater Network Renewal Program, which consisted of the Wastewater Team working in conjunction with contractors repairing broken House Connection Branches in the Shire.

Table 8 below shows the number of sewer reticulation activities and complaints across the wastewater schemes.

Table 8. Wastewater Reticulation Services

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	2	7
Sewer Chokes	3	0
Sewer Main Breaks	0	1
HCB Repairs (House Connection Branch)	8	5
Odour Complaints	0	0
Public Complaints	0	0
Reportable Incidents	0	0

2. Influent and irrigation flows

Port Douglas Wastewater Treatment Plant

A total of 305,526 kL of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average daily flow was 3395 kL/day. Tanker truck contractors delivered 397 kL of septage to the plant and 408 kL of Leachate from the Killaloe Landfill and Transfer Station. Influent is treated in a Sequencing Batch Reactor (SBR) which produced compliant effluent during the reporting period. A total of 31% of the treated effluent was pumped to two resort golf courses for irrigation purposes and the remaining discharged into the Dickson Inlet.

The Sheraton Mirage received 64,433kL and Palmer Sea Reef received 35,817 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 968.5 mm. On 11th January of 2022, the highest rainfall on a day recorded was 142 mm at PDWWTP.

The current COVID-19 safe workplace update within this reporting period has continued with staff within wastewater adhering to the social distancing rules, wearing masks in indoor places and in vehicles as required. The Wastewater team have responded to the pandemic virus COVID-19 by splitting the workforce into two teams to minimise risk to workers, maintain community safety and ensuring essential services are being delivered.

In December 2020, Queensland Health commenced a state-wide wastewater surveillance program for COVID-19. The program finished at the end of 2021 while having a strong support from the Chief Health Officer. Wastewater at both Mossman and Port Douglas wastewater treatment plants was tested under COVID-19 surveillance program. With the fast-changing COVID-19 situation, QLD Health has advised that the sampling is no longer needed, and the collection of wastewater samples has now ceased.

Daily inflows, outflows and recycled water supplied for the reporting period are presented in Fig 9 and 10 respectively.

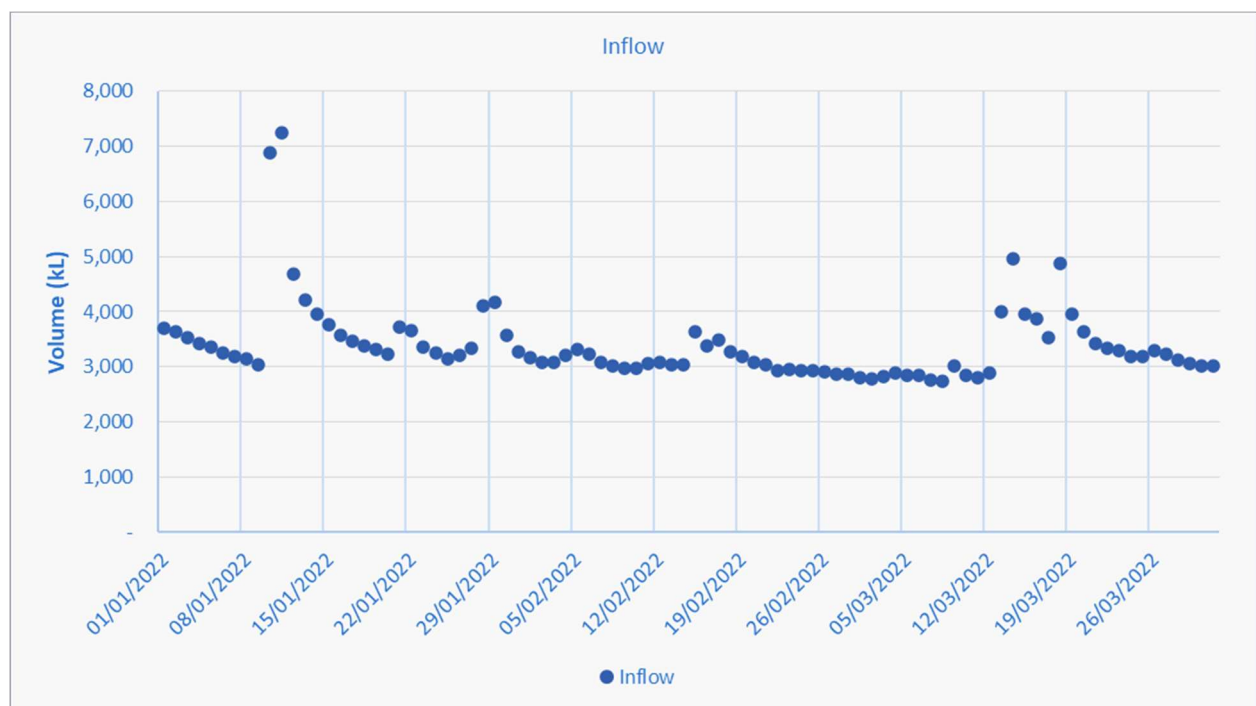


Fig 9. Port Douglas Daily Inflow

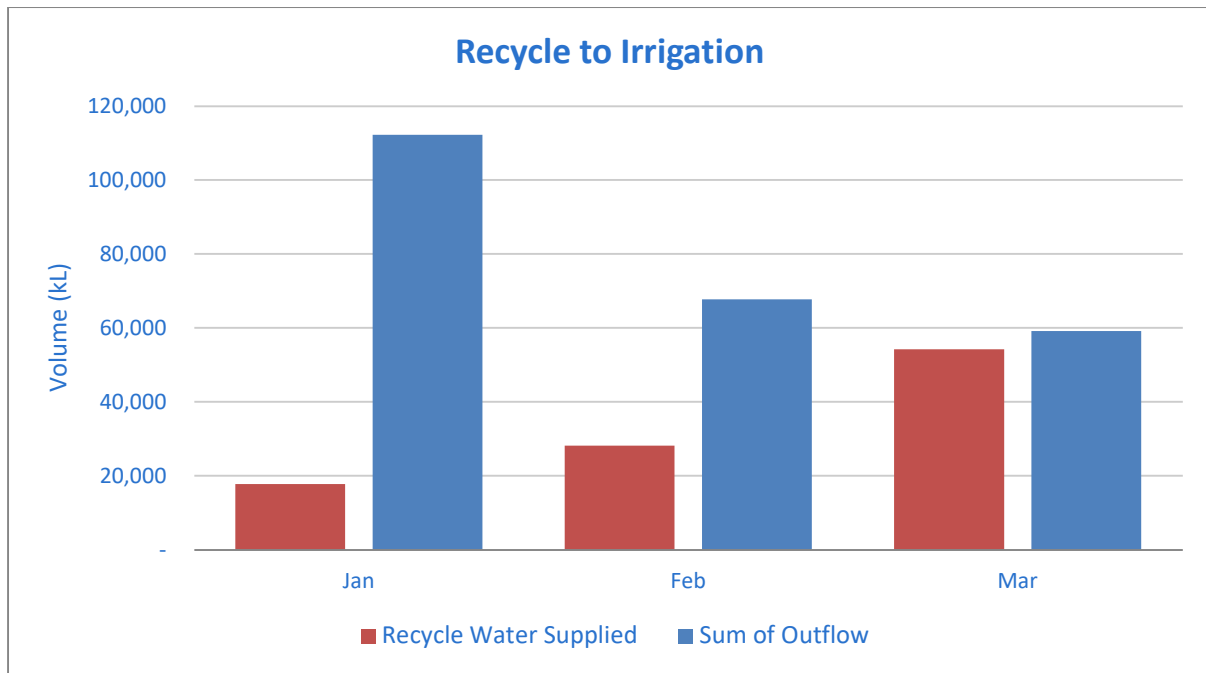


Fig 10. Port Douglas Total Monthly Outflow

Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 144,548 kL during the reporting period. The average daily flow was 1,606 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River.

A total of 1,050 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 100 mm on 11th January 2022 at MWWTP.

Outflow and Inflow data for the reporting period are shown in Fig 11 and 12 respectively.

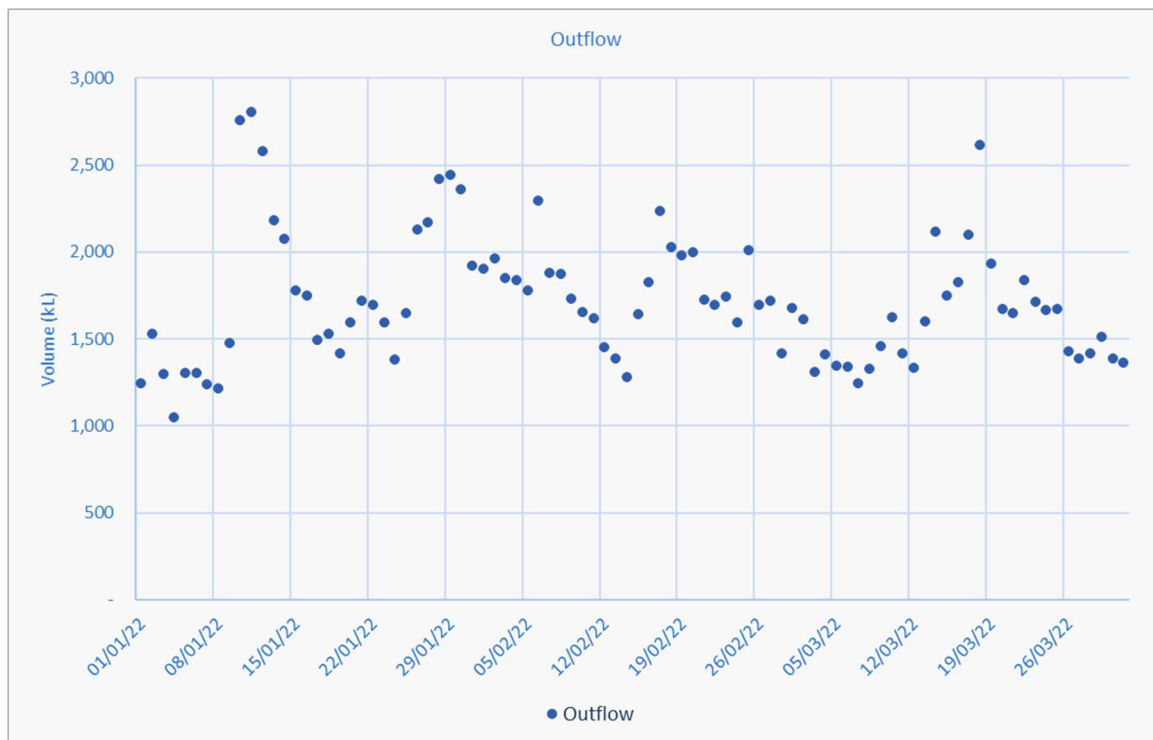


Fig 11. Mossman Wastewater Treatment Plant Daily Outflow

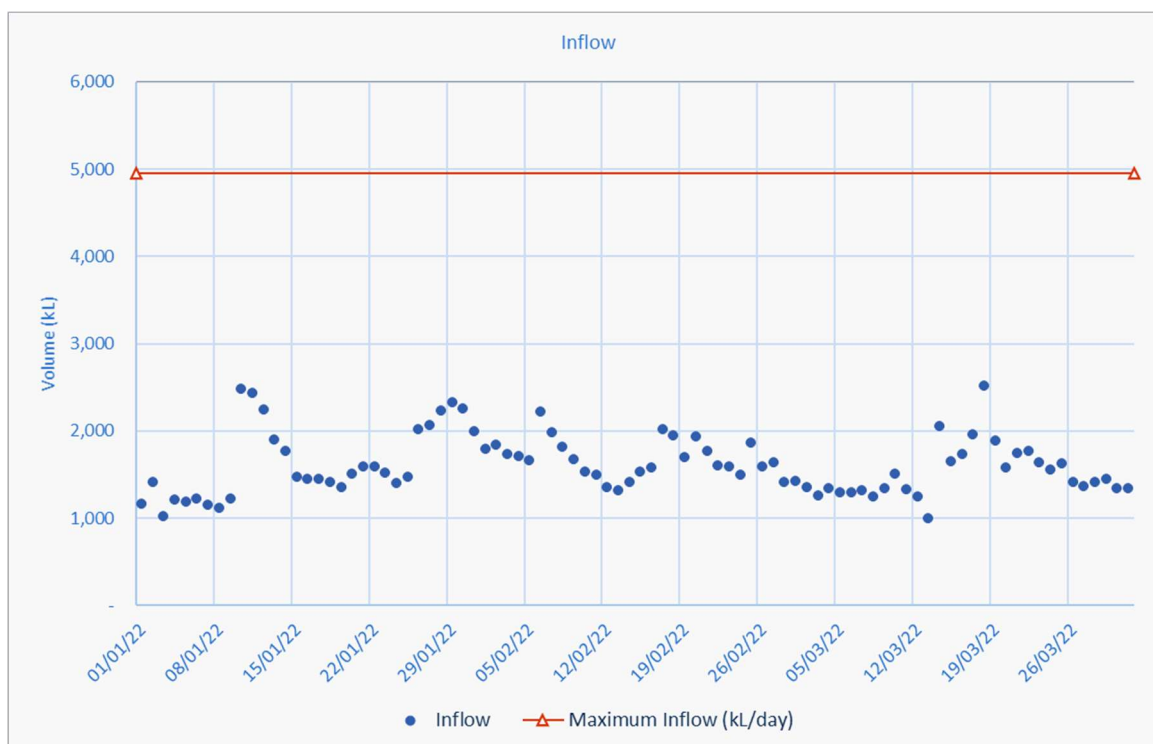


Fig 12. Mossman Wastewater Treatment Plant Total Daily Inflow

3. Bio-solids Production

Bio-solids were produced at the dewatering plants at Port Douglas Wastewater Treatment Plant (11% solids) and Mossman Wastewater Plant (10% solids). Bio-solids were transported by Arkwood Organics to Edmonton Farms, Tablelands Regional Farms and Spring Mount Waste Facility for further treatment and beneficial land application as organic fertiliser and soil conditioner.

Port Douglas Wastewater Treatment Plant

At Port Douglas Wastewater Treatment Plant, 275 tonnes of wet bio-solids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet bio-solids equates to 2.75 dry tonnes.

The monthly bio-solids production trends can be seen in Figure 13.

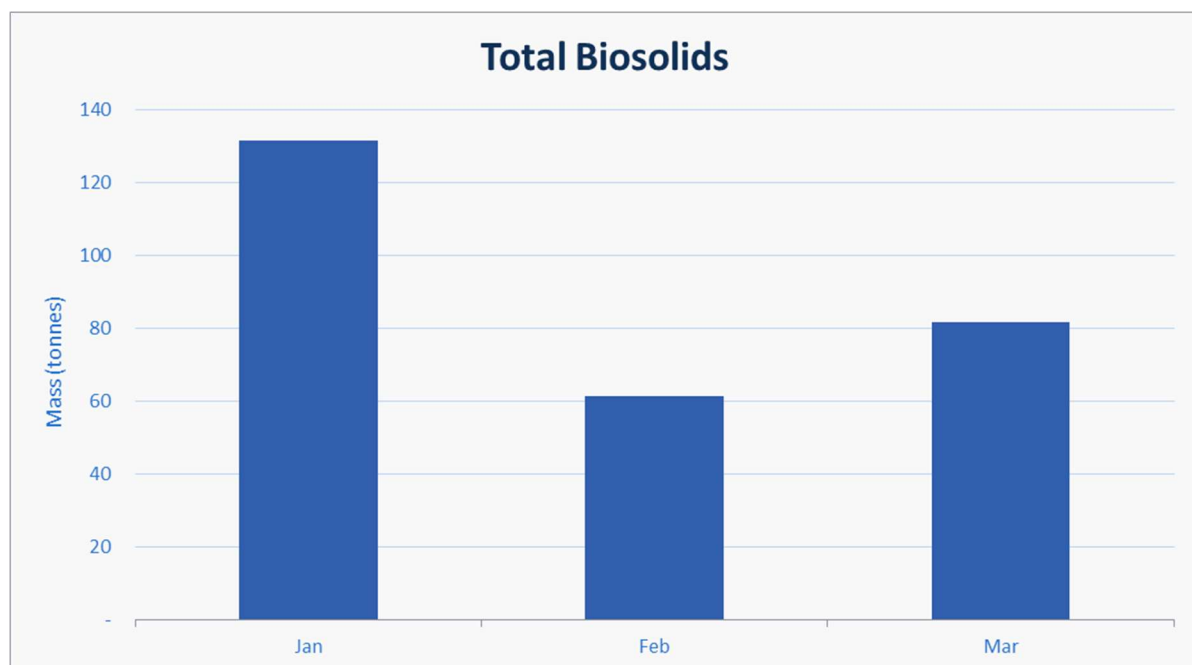


Fig 13. Port Douglas Wastewater Treatment Plant monthly bio-solids production 2022

Mossman Wastewater Treatment Plant

At Mossman Wastewater Treatment Plant, 55 tonnes of wet bio-solids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet bio-solids equates to 5.50 dry tonnes.

The monthly bio-solids production trends can be seen in Figure 14.

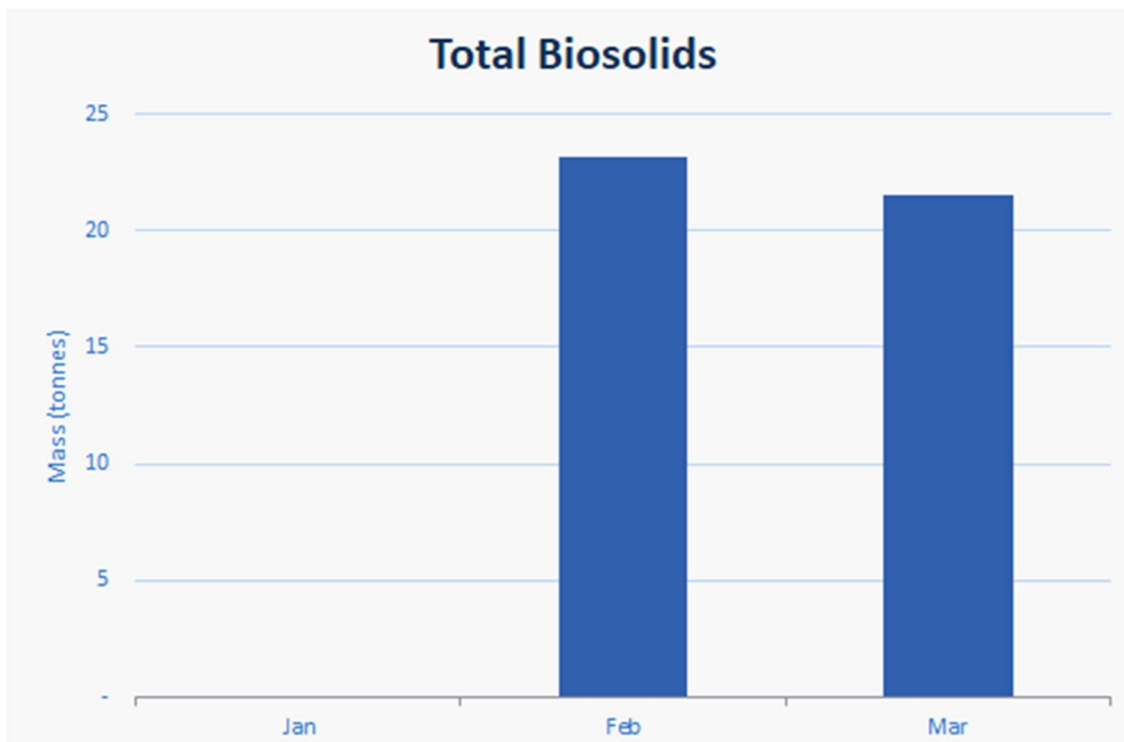


Fig 14. Mossman Wastewater Treatment Plant monthly bio-solids production (nil production in January 2022)

Effluent quality and compliance

During the reporting period, compliance sampling was performed as per EPPR01790513 license conditions, see Table 9.

Table 9. Monitoring of contaminant releases to waters as per Environmental Authority EPPR01790513

Characteristics Determination	PDWWTP Frequency	MWWTP Frequency
5-day Biochemical Oxygen Demand	weekly	fortnightly
Suspended Solids	weekly	fortnightly
pH	weekly	weekly
Dissolved Oxygen	weekly	weekly
Ammonia Nitrogen	fortnightly	fortnightly
Total Nitrogen	fortnightly	fortnightly
Total Phosphorus as P	fortnightly	fortnightly
Oil and Grease	fortnightly	fortnightly
Faecal Coliforms (Organisms/100ml)	fortnightly	fortnightly
Free residual chlorine	-	fortnightly

Additionally, more samples are taken from the treatment processes, bio-solids, receiving waters and bores. Samples are tested by a NATA accredited laboratory for physical, chemical and microbiological parameters. All parameters tested during the reporting period from the Port Douglas and Mossman wastewater treatment plants were compliant.

Treatment process and compliance monitoring is carried out each day by in-house analyses of samples at the wastewater treatment plants. Process settings, effluent quality, flow rates, pump stations performance and maintenance aspects are monitored and controlled with SCADA Citect via an extensive Telemetry network.

Port Douglas Wastewater Treatment Plant

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids, BOD₅ & Total Nitrogen) are shown in Figure 15, 16, 17, 18 & 19.

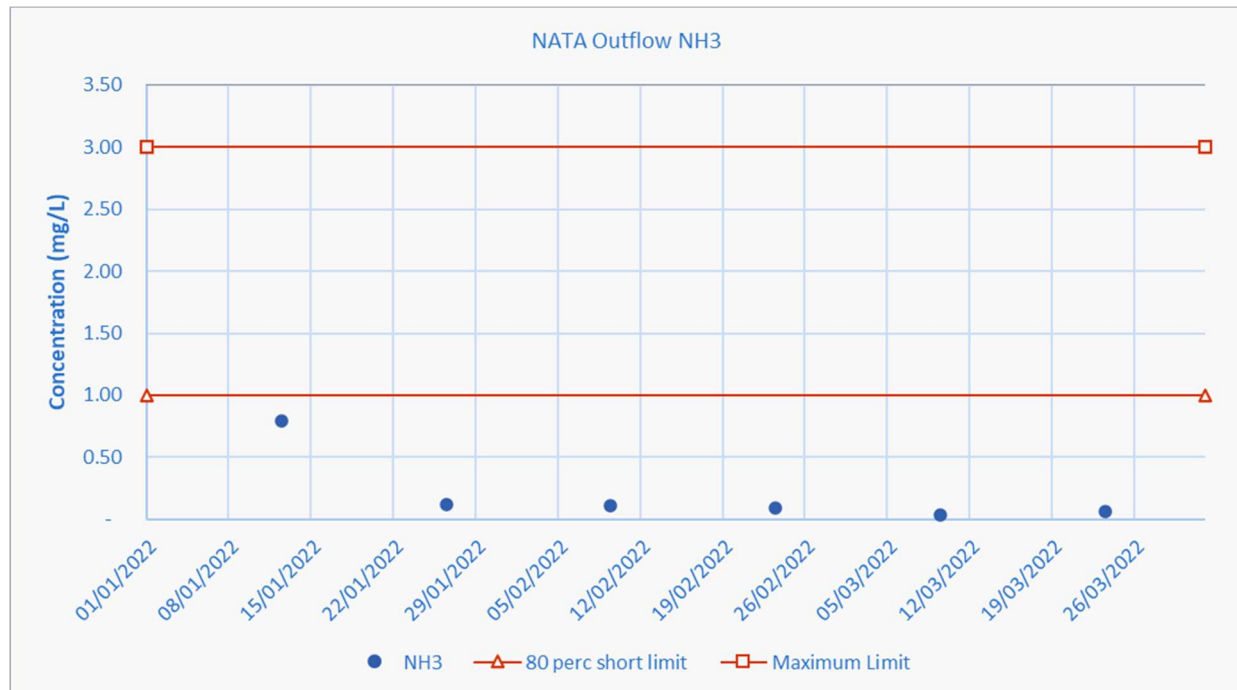


Fig 15. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Ammonia

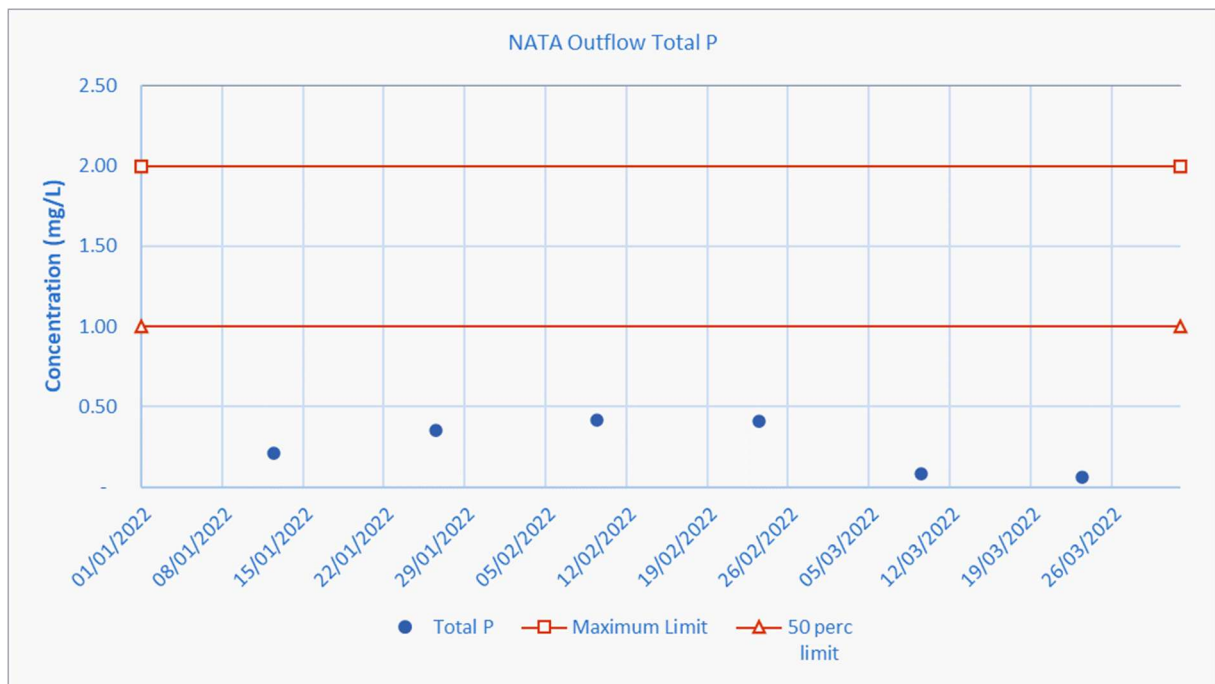


Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous

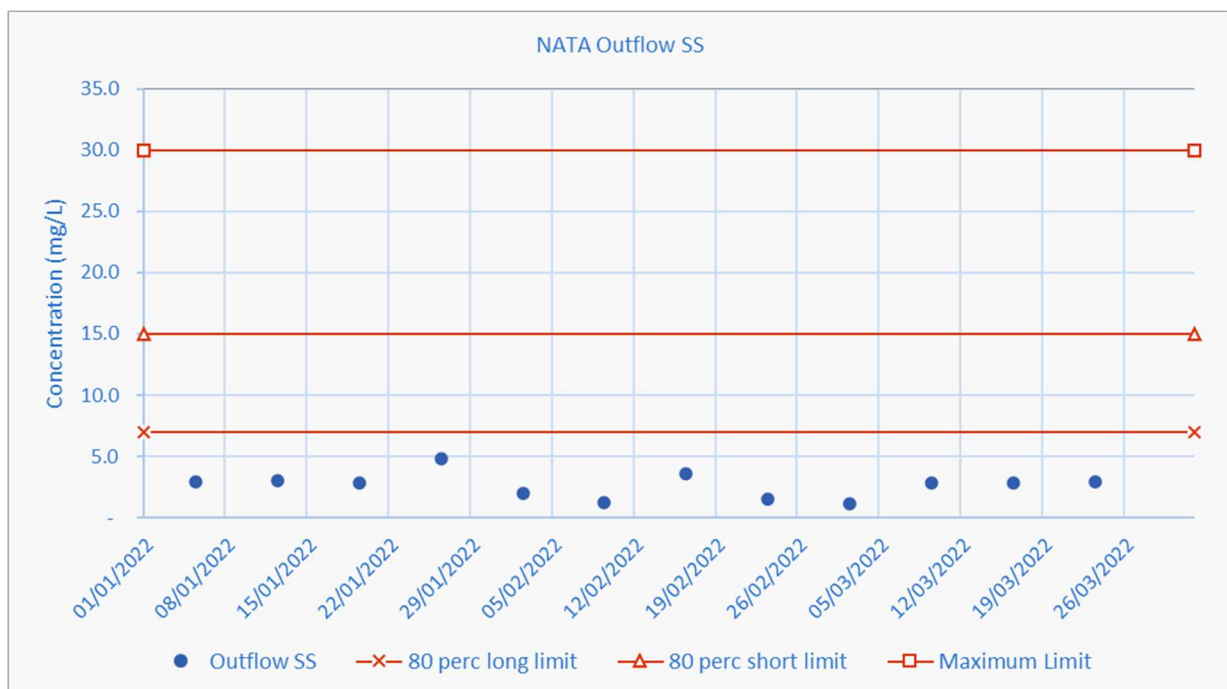


Fig 17. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids

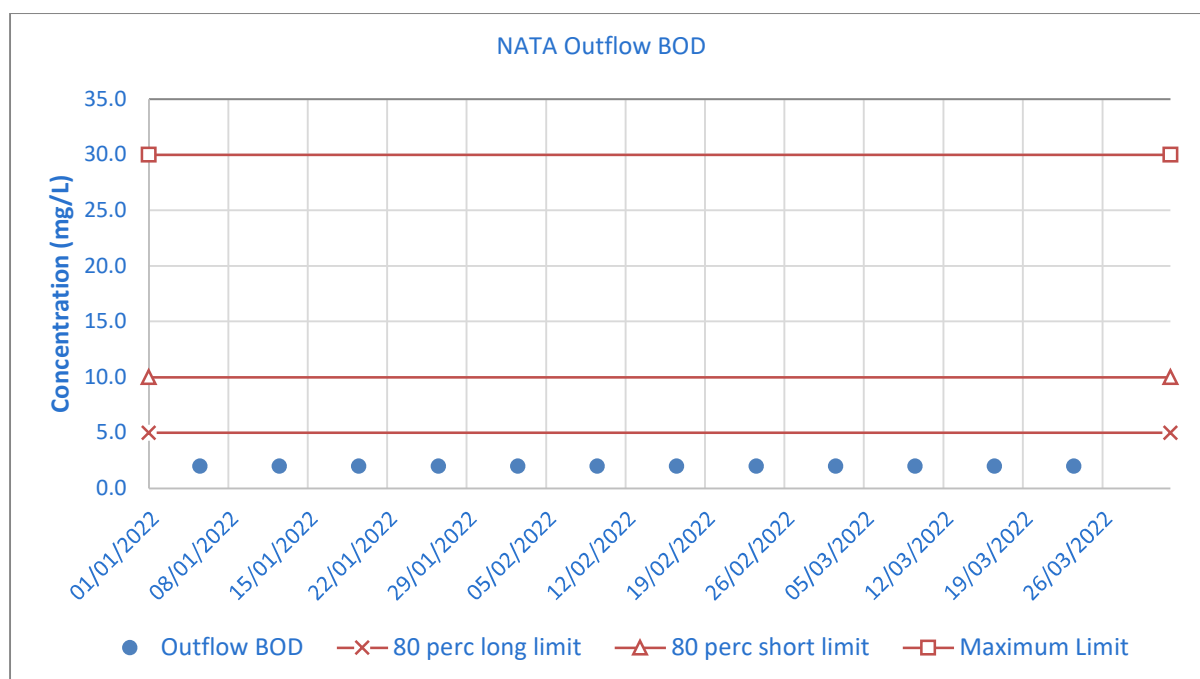


Fig 18. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD₅ (Biochemical Oxygen Demand)

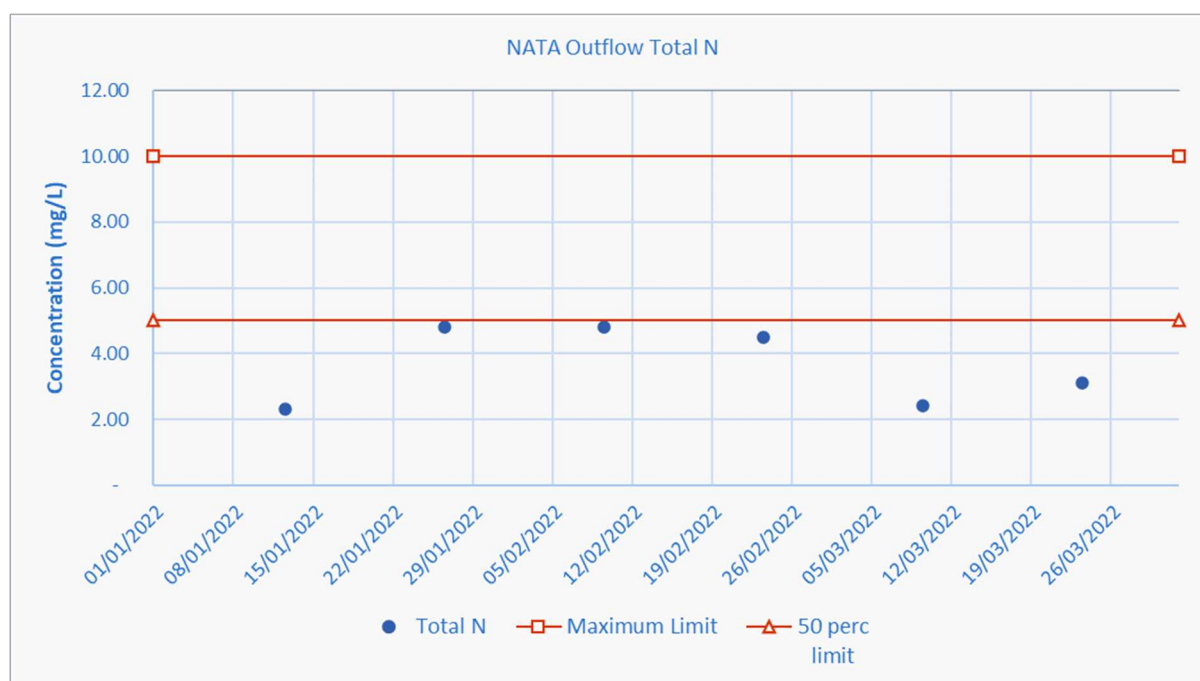


Fig 19. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Nitrogen

Mossman Wastewater Treatment Plant

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids, BOD₅ & Total Nitrogen) are shown in Figures 20, 21, 22, 23 & 24.

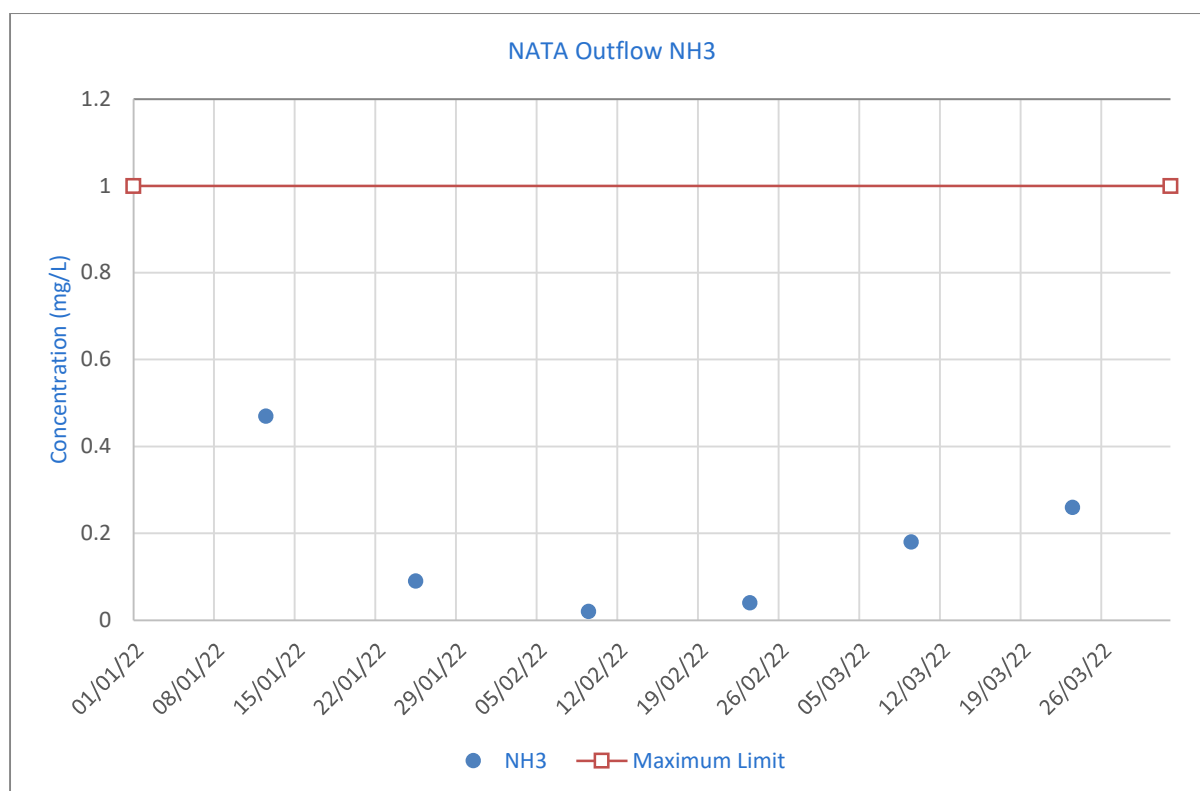


Fig 20. Mossman Wastewater Treatment Plant Final Effluent Test Results for Ammonia

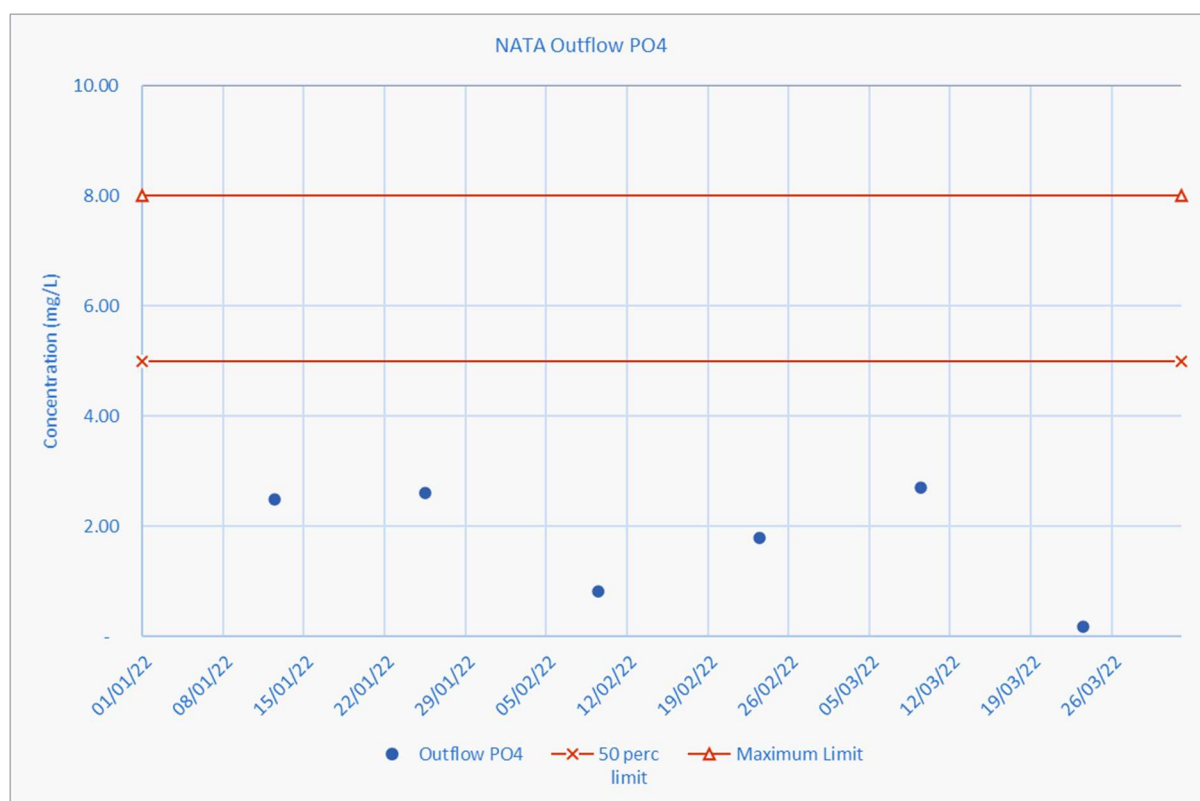


Fig 21. Mossman WWTP Final Effluent Test Results for Total Phosphorous

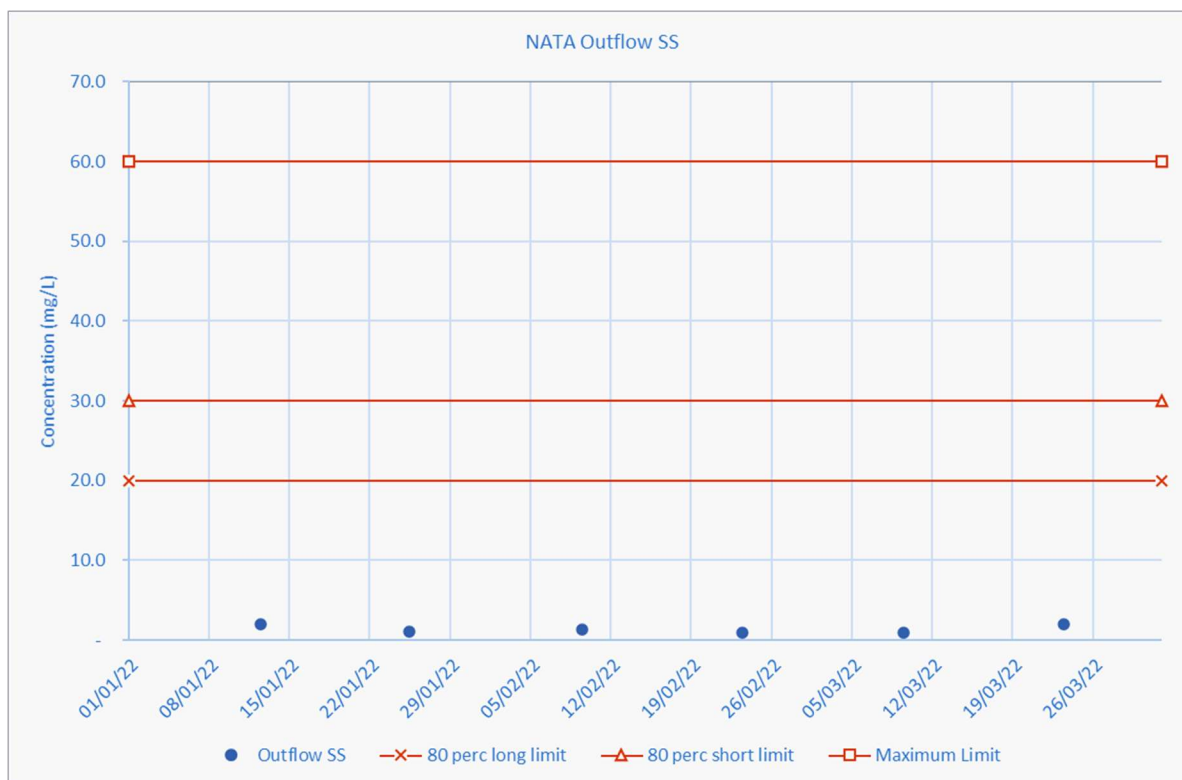


Fig 22. Mossman WWTP Final Effluent Test Results for Total Suspended Solids

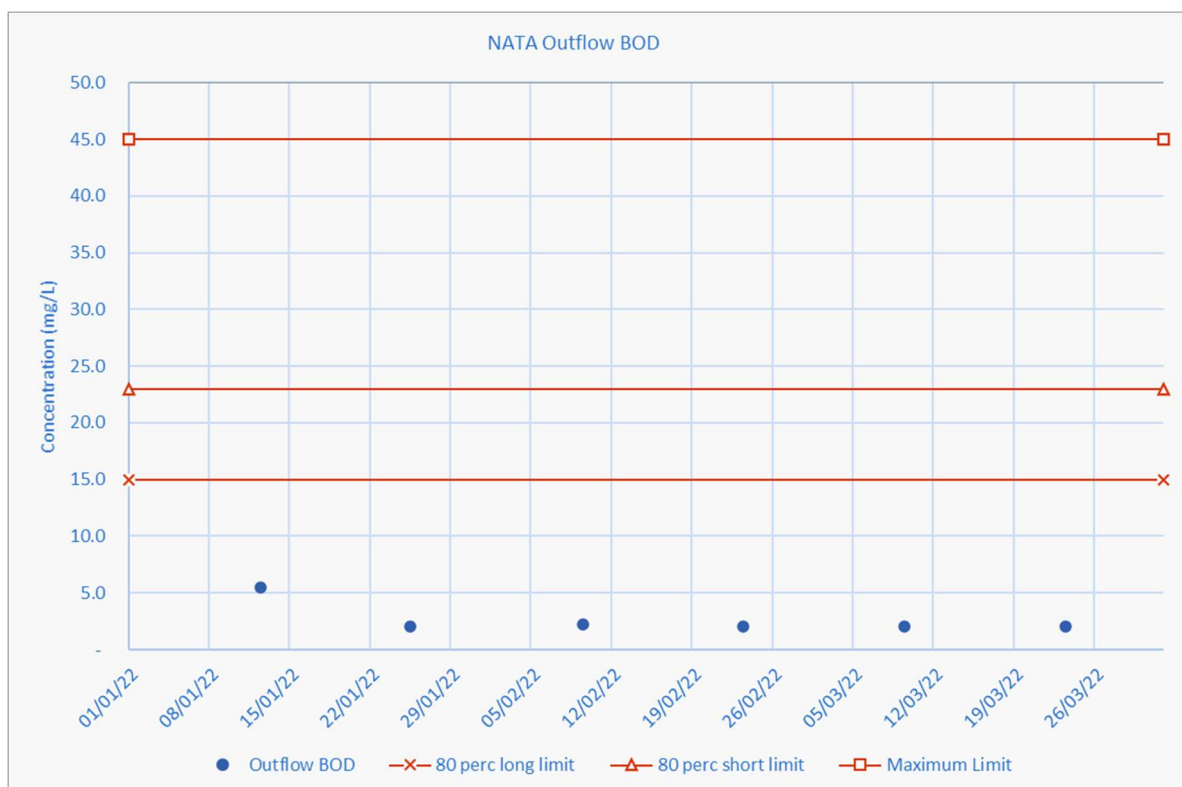


Fig 23. Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD₅ (Biochemical Oxygen Demand)

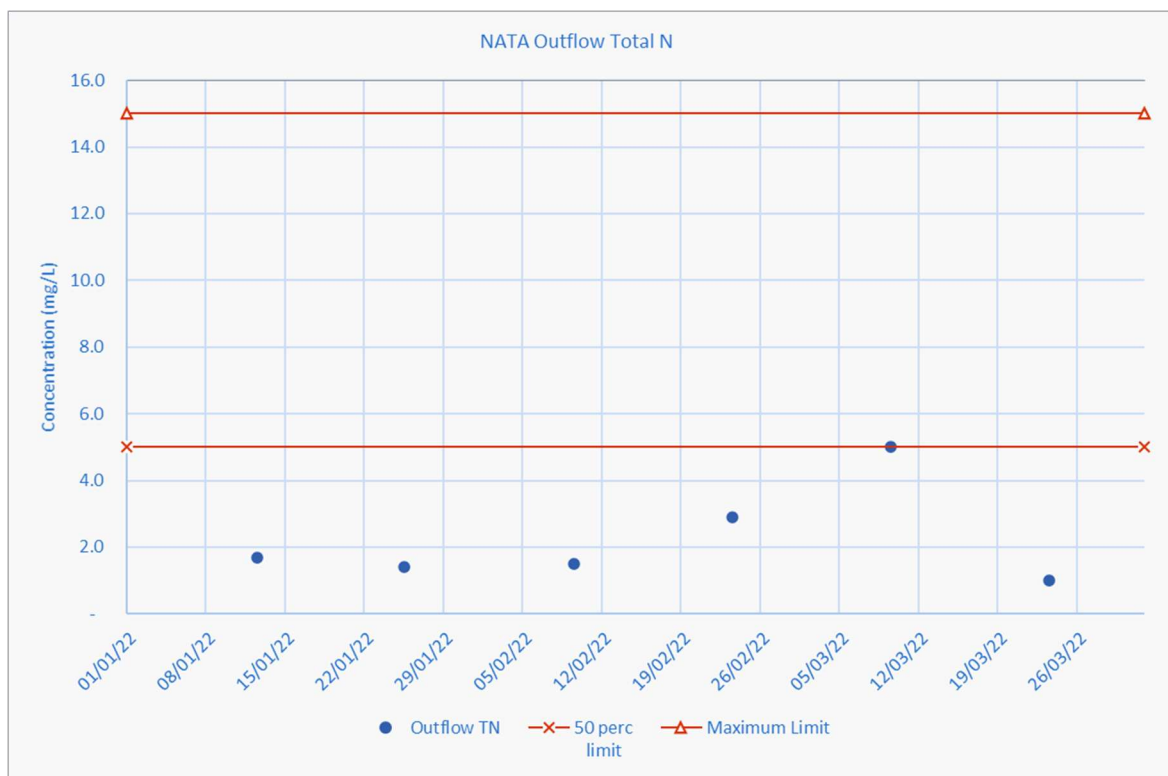


Fig 24. Mossman Wastewater Treatment Plant Final Effluent Test Results for Total Nitrogen