

5.7. WATER AND WASTEWATER QUARTERLY REPORT PERIOD ENDING 30 JUNE 2019

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DEPARTMENT	Water and Wastewater

RECOMMENDATION

That council receives and notes the quarterly report of the Water and Wastewater Department for the period ending 30 June 2019.

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 April to 30 June 2019.

The results are generally positive and will incrementally improve through capital and operational projects over the new financial year. In the 2018/2019 capital works program, notable capital improvements included the completion of the Rex Creek intake renewal, Daintree Bore installation, Mossman to Whyanbeel water mains interconnection, Mossman Wastewater Treatment plant second clarifier, sewer pipe mains and pump renewals and the Port Douglas Wastewater Treatment Plant security fence.

BACKGROUND

This report is the fourth quarterly report submitted by the Water and Wastewater Department during the 2018/2019 financial year. This report highlights progress against key performance areas required by the Department of Energy and Water Supply and required compliance levels by the Department of Environment and Heritage Protection.

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.

This report is for period ending 30 June 2019 therefore it is referencing to the previous Corporate Plan 2014-2019 Initiatives and the Operational Plan 2018-2019 Actions.

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 2014-2019 Initiatives:

Theme 3 - Improve Environmental Performance

3.2.3 - Investigate process improvements at Council's wastewater treatment plants to improve wastewater quality, save energy and identify markets for end products.

Theme 5 – Governance

5.2.1 - Provide Councillors and community with accurate, unbiased and factual reporting to enable accountable and transparent decision-making.

5.3.4 - Develop practices and skill levels to ensure safety and wellbeing in the workplace.

Operational Plan 2018-2019 Actions:

2.1.2 - Additional water extraction site designed and integrated into existing water infrastructure.

2.1.3 - Asset Edge trial for Water and Wastewater operations.

3.1.1 - Develop and implement a Trade Waste Environmental Management Plan and update processes and software to ensure compliance and efficiency.

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:

Asset-Owner	Meeting the responsibilities associated with owning or being the custodian of assets such as infrastructure.
Regulator	Meeting the responsibilities associated with regulating activities through legislation or local law.

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 Energy and Water Supply and the Department of Environment and Heritage Protection.
Community:	Nil

ATTACHMENTS

1. Water and Wastewater Quarterly Report for the period ending 30 June 2019 [5.7.1 - 19 pages]

1 April – 30 June 2019

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 Natural Resources, Mines and Energy (DNRME) and the Department of Environment and Science (DES).

Water

1. Water reticulation services

General maintenance was carried out on all schemes for this quarter including all intakes. Hydrant and valve maintenance was performed two days each week to identify their locations and any maintenance issues. Water flushing programs were implemented due to the maintenance and functionality of hydrants, water quality complaints that related to aesthetic issues and for maintaining acceptable chlorine residuals within the schemes. All water quality complaints were responded to immediately and the customers were satisfied with the outcome.

Regular reservoir and pump station checks and intake maintenance are carried out on all schemes.

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

Douglas Shire Reticulation (all schemes)	
Settlement Meter Reads	84
New Water Services Connections	1
Service Repairs	162
Water Mains Repairs	1
Water Quality Complaints	5
Dial before you dig	123
Flushing Events: Mossman/Port Douglas/Cooya/ Newell	15
Flushing Events: Whyanbeel/Wonga	6
Flushing Events: Daintree	6

There were five water quality complaints during the reporting period. Table 2 below details the nature of the complaint, how it was resolved and the response time. All water quality parameters measured were within the health guideline limits in the Australian Drinking Water Guidelines (ADWG).

Table 2. Water Complaints

Address	CRM No & Date	Nature of water complaint	How it was resolved	Response Time
15 Middlemiss Street, Mossman	72711/2019 17/06/2019	Tap water was discoloured	Water quality tested and the water main was flushed with a good residual value.	20 mins
27 Coral Drive, Port Douglas	72066/2019 29/05/2019	Tap water was discoloured and had a metallic taste	Water taste may be from old pipes on the property. Customer to continue monitoring. Water quality samples were taken and results were good and clear and no taste difference and customer happy with the outcome.	20 mins
217 Cassowary Road, Cassowary	71129/2019 07/05/2019	Tap water was cloudy	Water main system was full of air, water mains were flushed and customer satisfied and happy with the outcome.	15 mins
1A Coral Sea Drive, Mossman Gorge	70949/2019 01/05/2019	Tap water was discoloured	Water quality tested and water was clear, found no water quality issues with the water main system and pipe work. Customer to monitor and notify council if similar events occur. Customer was satisfied and happy with the outcome.	20 mins
24-32 Davidson Street, Port Douglas	70434/2019 10/04/2019	Tap water was discoloured	Water quality samples were taken and results were good. Water main system was flushed and water was clear. Customer satisfied and happy with the outcome.	15 mins

The second stage of the capital works program on the Rex Creek Intake renewals was completed at the end of this reporting period. The aim of this upgrade was to improve the quality and performance of the overall Rex Creek water intake system and create a safe working environment for operations staff. Installation of new Johnson screens, rain gauge, stairs, hand rails, concrete scour channel, stainless steel intake channel and water chambers were the main features of the Rex Creek intake upgrade. In the 2018/2019 capital works program, there were notable capital improvements such as the completion of the Daintree Bore installation, Mossman to Whyanbeel water mains interconnection, Daintree Water Treatment plant new scour valves, Mossman Water Treatment plant ultra-filtration turbidity meter and the replacement of control valves at the Whyanbeel Water Treatment plant.

2. Water schemes and potable water consumption

Water Restrictions

No water restrictions have remained in force for the whole of the reporting period.

Steady rain continues in the months of April and May, this resulted in a high water intake level at Rex Creek. This high intake level assisted in alleviating the increased demand which occurs each year in the peak tourist season commencing in June.

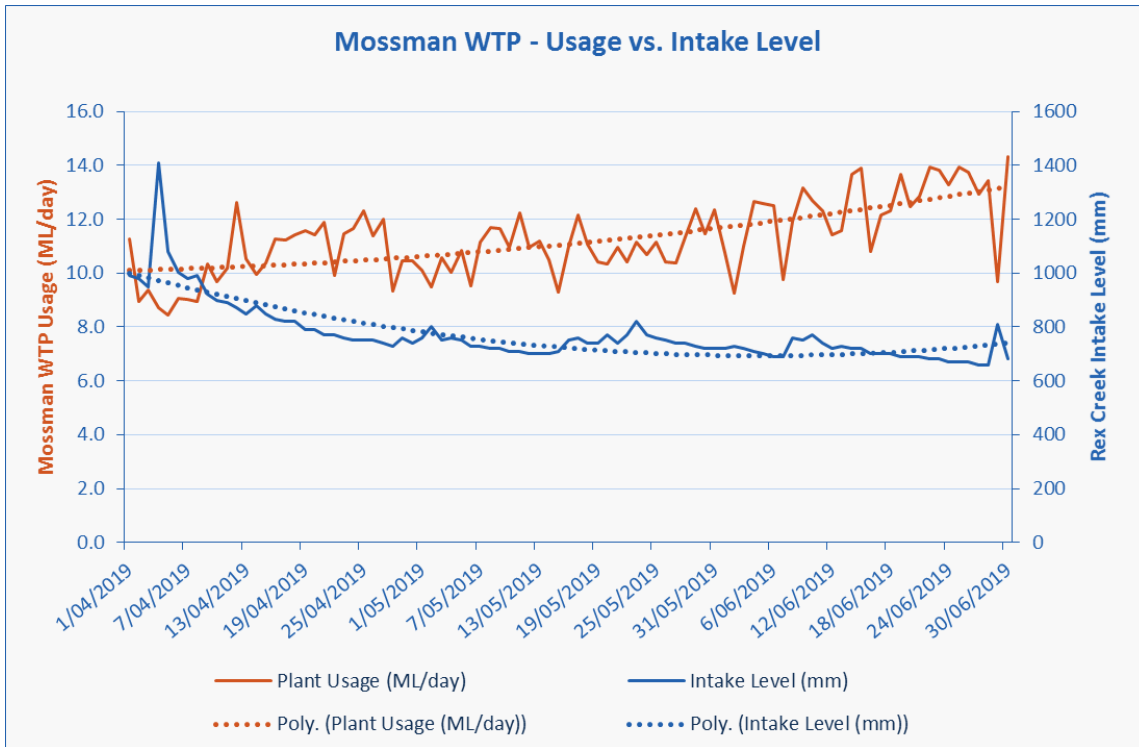


Fig 1. Mossman WTP usage and Rex Creek intake levels for the period 1 April 2019 – 30 June 2019

All Schemes

Raw water quality has varied, though generally has been good throughout all schemes. In the early part of the reporting period some heavy rain events resulted in a number of plant shutdowns due to high turbidity levels, in the latter part of the reporting period the weather stabilised and the intake levels were favourable with raw water turbidity averaging below 1 NTU.

Throughout the water schemes, all pump stations performed well with no incidents.

The De Meio Drive bore field and non-potable storage reservoir operated at normal production. Craigie reservoir was fully operational. Both Flagstaff and Rocky Point reservoirs performed well and the calcium hypo automated dosing facilities maintained stable chlorine levels in the drinking water.

Cert IV water industry training continued for two Water and Wastewater plant operators.

Mossman/Port Douglas Scheme

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

Consumer demand increased in line with seasonal trends. Ongoing rainfall during this reporting period provided good available raw water flows with no impact to our maximum instantaneous extraction rate.

All Ultra Filtration (UF) racks were operational and maintenance works continued with cartridge repairs to ensure compliance with UF rack integrity test limits. As part of our 2018/2019 Capital works programme, new UF cartridges racks were installed on two modules at the Mossman Water Treatment plant.

General maintenance works were also undertaken including pump repairs and equipment servicing.

There were no water quality reportable incidents in the Mossman/Port Douglas water scheme for this reporting period.

Mossman Water Supply

The total monthly consumption of water in Mossman, Cooya Beach and Newell Beach areas can be seen in Figure 2.

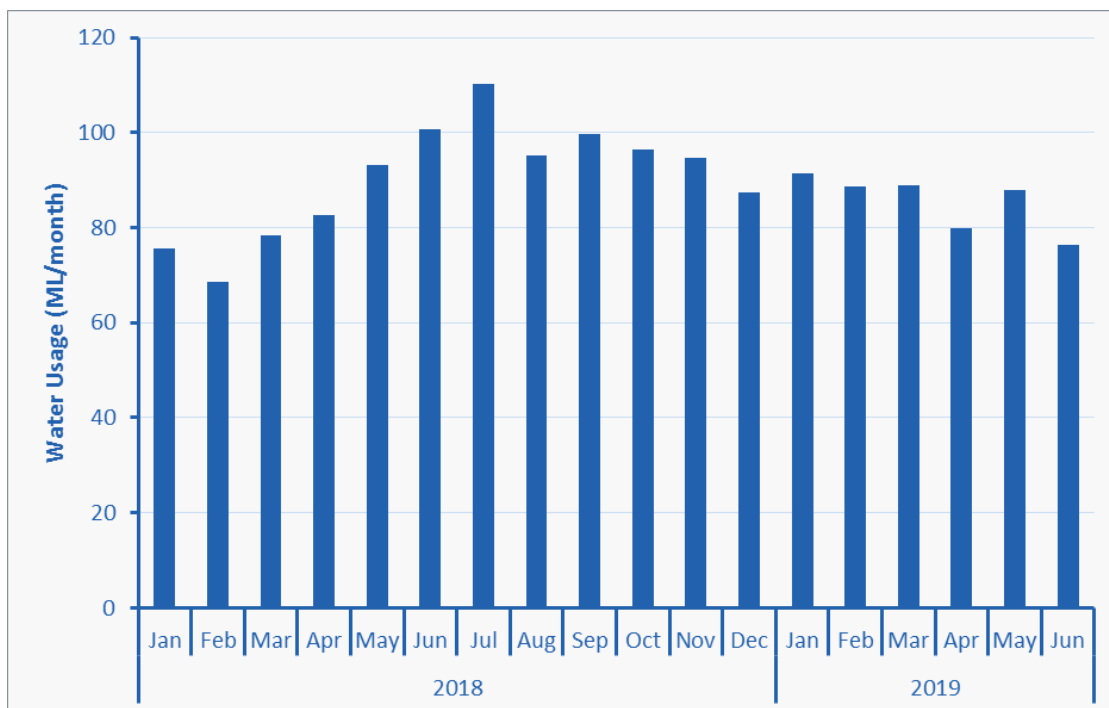


Fig 2. Mossman Scheme Total Monthly Consumption Figures

Port Douglas Water Supply

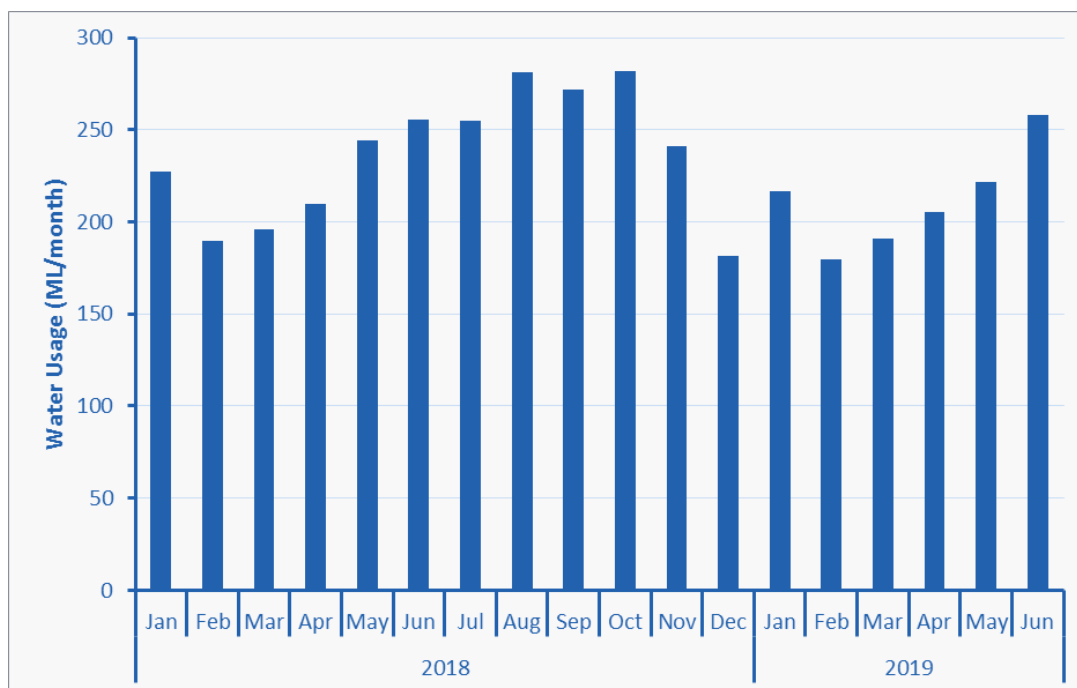


Fig 3. Port Douglas Scheme Total Monthly Consumption Figures

Whyanbeel Scheme

Whyanbeel Water Treatment Plant met all demand requirements during the reporting period. As part of the 2018/2019 capital works programme the Whyanbeel intake renewals continued throughout this reporting period and will be completed in the next financial year. The aim of this upgrade is to improve the quality and performance of the Little Falls water intake system and create a safe working environment for operations staff.

The UF rack was fully operational during the reporting period. To maintain UF filter efficiency chemical clean-in-place operations were undertaken and general maintenance work continued.

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

Whyanbeel Water Supply

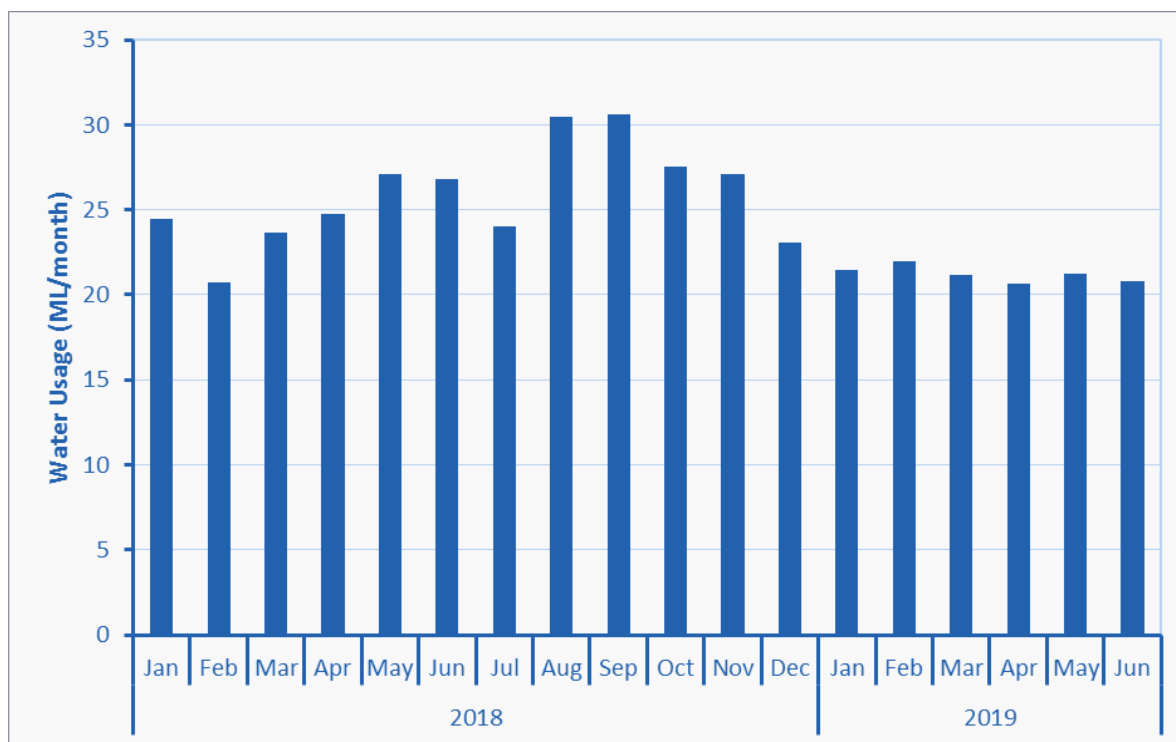


Fig 4. Whyanbeel Scheme Total Monthly Consumption Figures

Daintree Scheme

Daintree Water Treatment Plant met all demand requirements during the reporting period. There has been a good supply of water from the Daintree intake due to temporary operational works on repairing the inlet pipework. Also improvements were made with the installation of scour valves on the raw water pipeline to control turbidity levels at the raw water holding tank at Daintree Water Treatment plant.

The new Daintree bore field extraction pumping station has been commissioned and final water quality sampling has been completed. The bore field extraction site will be utilised to augment the regions raw water supply during severe weather events whereby the flows from intake creek become diminished.

To maintain UF filter efficiency chemical clean-in-place operations were undertaken and general maintenance works continued.

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

Daintree Water Supply

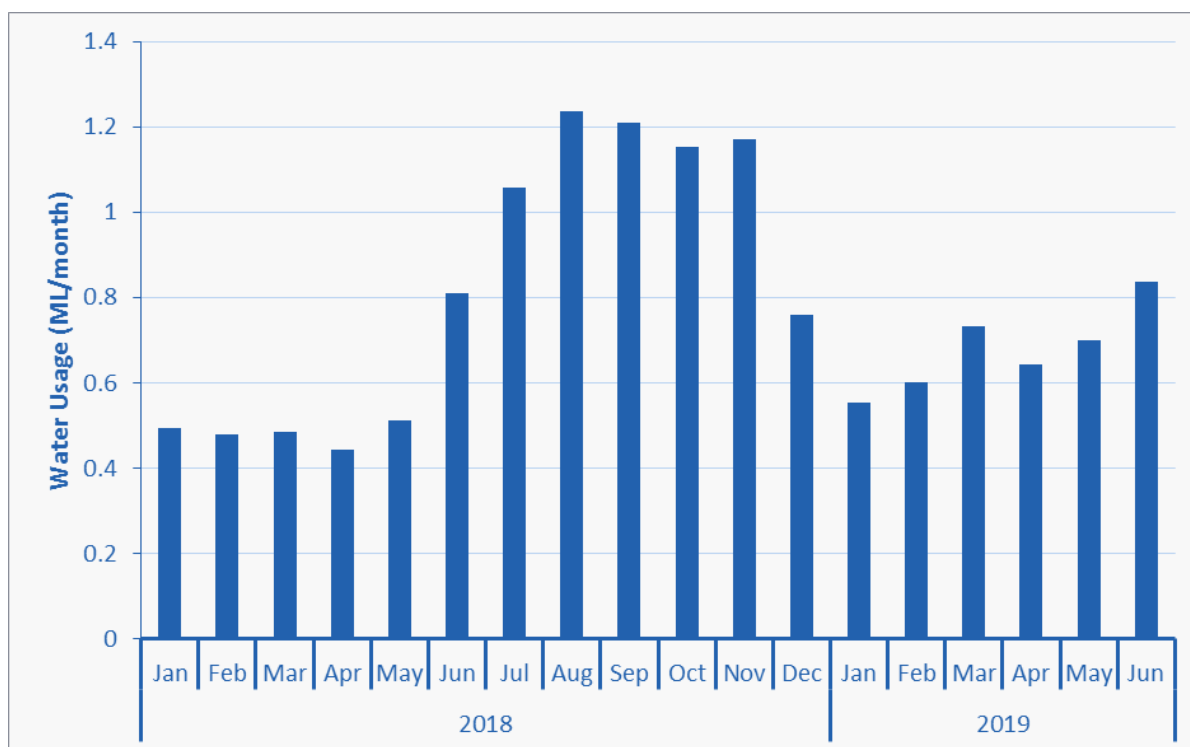


Fig 5. Daintree Scheme Total Monthly Consumption Figures

3. Water quality monitoring and results

Drinking water is sampled 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 69 treated water E.coli compliance samples were taken in the three drinking water schemes. A total of 27 E.coli samples were tested in the Douglas water laboratory and 42 in a NATA accredited laboratory. Other parameters monitored allow us 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 April to June 2019.

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

Month	pH	Temp °C	Total Alkalinity mg CaCO3/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	<5	<1
Apr-19	7.1	27	6	1.1	1.2	<1
May-19	7.2	26.1	9	1.1	1.2	<1
Jun-19	7.1	24.1	8	1.2	1.2	<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	<5	<15	<1	<0.3	<0.1	<1
Apr-19	7.2	27.2	0.9	1.0	<5	0.005	0.080	<0.005	<1
May-19	7.3	26.2	0.9	1.0	<5	0.005	0.010	<0.005	<1
Jun-19	6.7	23.9	1.0	1.0	<5	0.006	0.008	<0.005	<1

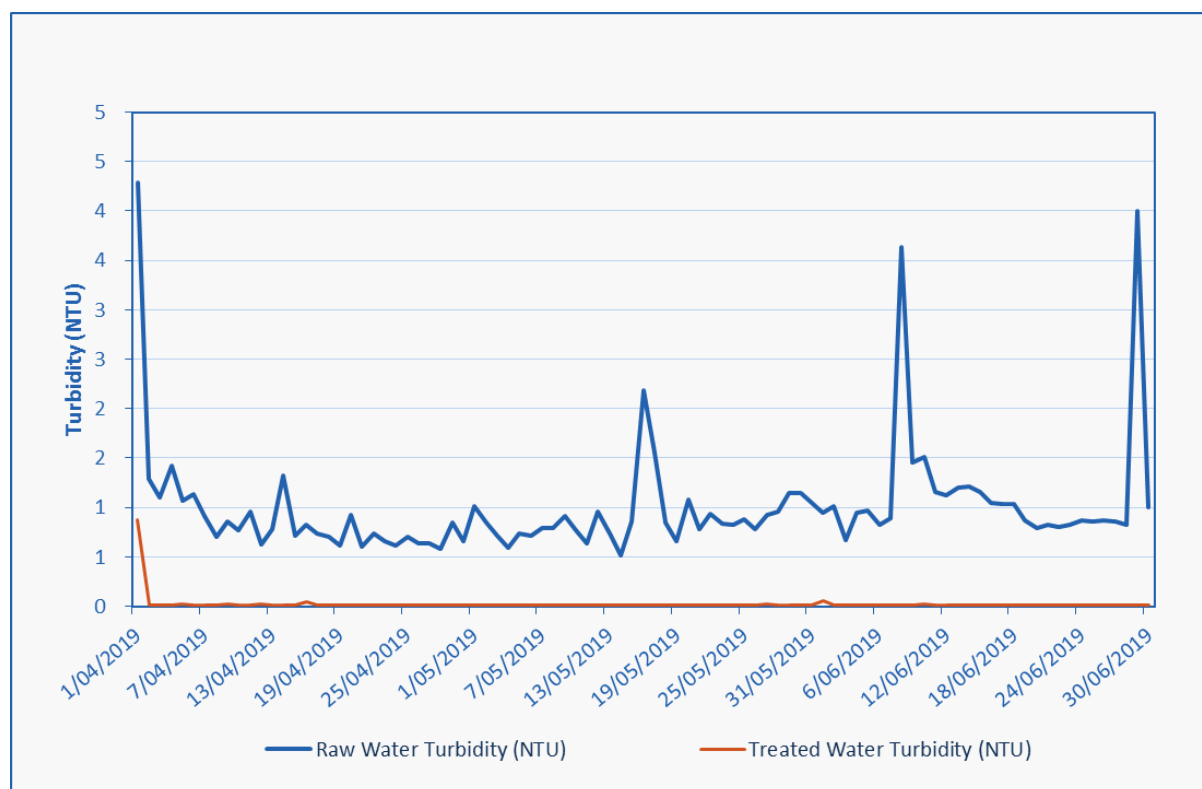


Fig 6. Turbidity trends at the Rex Creek intake and treated water at the Mossman Water Treatment Plant

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 April to June 2019.

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

Month	pH	Temp °C	Total Alkalinity mg CaCO3/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	<5	<1
Apr-19	7.7	26.7	13	1.1	1.1	<1
May-19	6.9	26.4	<5	1.1	1.1	<1
Jun-19	7.8	23.9	17	1.1	1.1	<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	<5	<15	<1	<0.3	<0.1	<1
Apr-19	7.7	27.4	0.8	0.9	<5	0.006	0.020	<0.005	<1
May-19	7.8	26.8	0.8	0.9	<5	0.004	0.024	<0.005	<1
Jun-19	7.7	24.3	1.0	1.0	<5	0.003	0.021	<0.005	<1

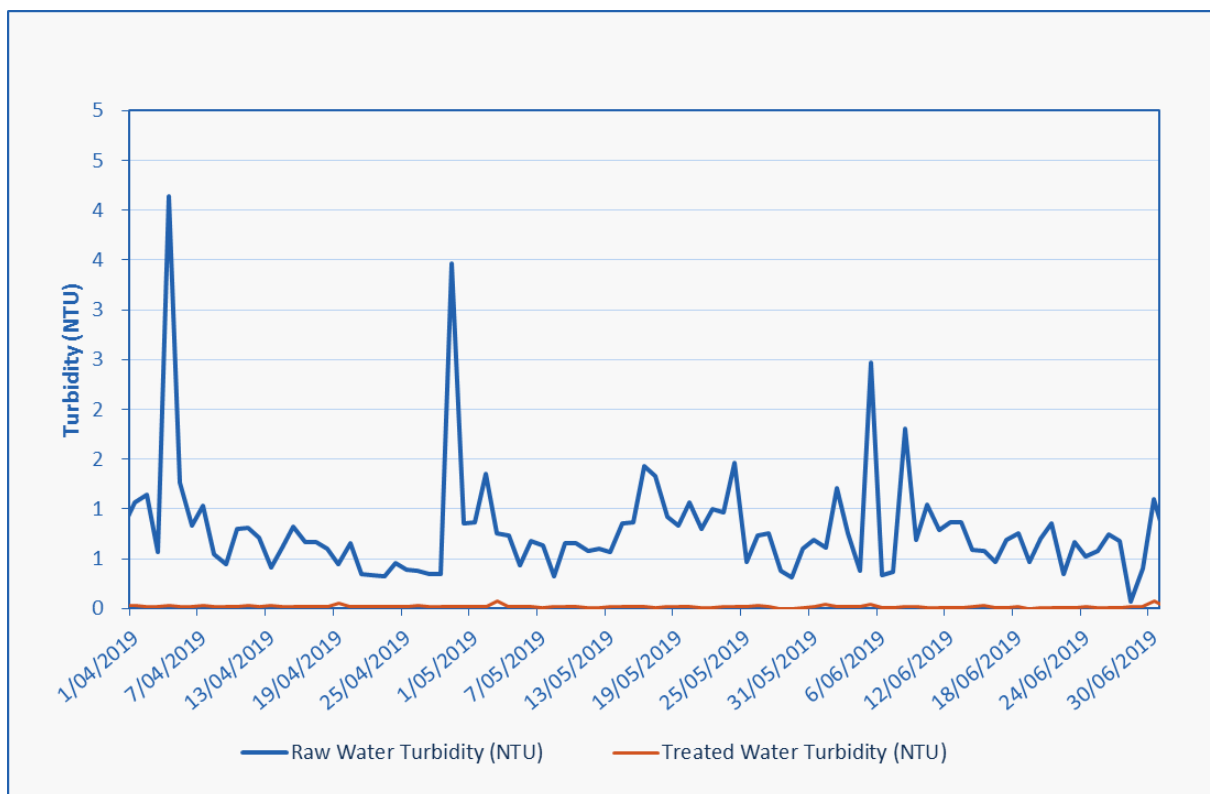


Fig 7. Turbidity trends at the Little Falls Creek intake and treated water at the Whyanbeel Water Treatment Plant.

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	<5	<15	<1	<0.3	<0.1	<1
Apr-19	8.4	26.4	0.3	0.3	<5	0.002	0.009	<0.005	<1
May-19	7.8	25.5	0.2	0.1	<5	0.002	0.005	<0.005	<1
Jun-19	8.1	23.5	0.3	0.4	<5	0.002	0.006	<0.005	<1

Daintree Supply Scheme

Average monthly values for key operational and compliance parameters are detailed in Table 7 for treated water at Daintree Reticulation network. Daintree reticulation network experienced some low chlorine events due to low water usage within the network. Low chlorine results initiated a flushing program, which helped reduce water age and elevated the chlorine levels back to normal. Figure 8 indicates the daily turbidity trends at the intake and treated water as recorded at the Daintree water treatment plant for the period April to June 2019.

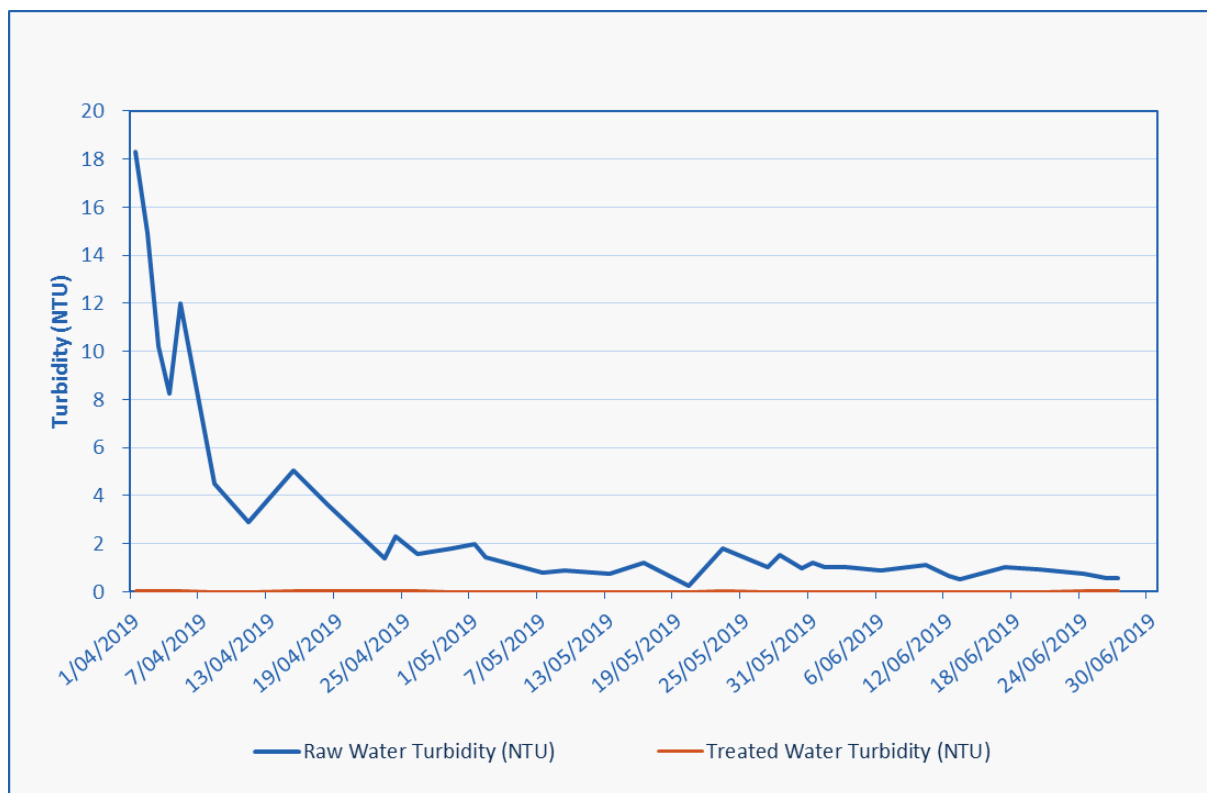


Fig 8. Turbidity trends at the Intake/Martin Creek intake and treated water at the Daintree Water Treatment Plant.

Wastewater

4. Wastewater reticulation services

General maintenance programs were performed on the reticulation networks and 31 pump stations in the Mossman and Port Douglas catchments.

A wastewater incident occurred in the Port Douglas wastewater catchment area in this reporting period and was reported to DES. Emergent works were carried out due to this incident, 260m of the sewer rising main was replaced between Sewer Pump Station C (Crimmins Street) to the Port Douglas Wastewater Treatment Plant (Mahogany Street). Another incident was reported to DES on 28 May 2019 for a minor sewer rising main break within the Mossman wastewater catchment area.

Table 8 below shows the number of maintenance activities undertaken across all schemes.

Table 8. Wastewater Reticulation Services

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	3	3
Sewer Chokes	1	1
Sewer Main Breaks	0	1
HCB Repairs (House Connection Branch)	4	0
Odour Complaints	1	0

Influent and irrigation flows

Port Douglas Wastewater Treatment Plant

A total of 304,715 kL of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average daily flow was 3,349 kL/day. Tanker truck contractors delivered 765 kL of septage to the plant and 3,272 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 resorts and the remaining discharged into the Dickson Inlet. The Sheraton Mirage received 76,885 kL and Palmer Sea Reef received 16,743 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 304.5 mm. On 4 April 2019, the highest rainfall on a day was recorded as 56 mm at Warner Street weather station.

Daily inflows and total monthly flows for the reporting period are presented in Fig 9 and 10 respectively.

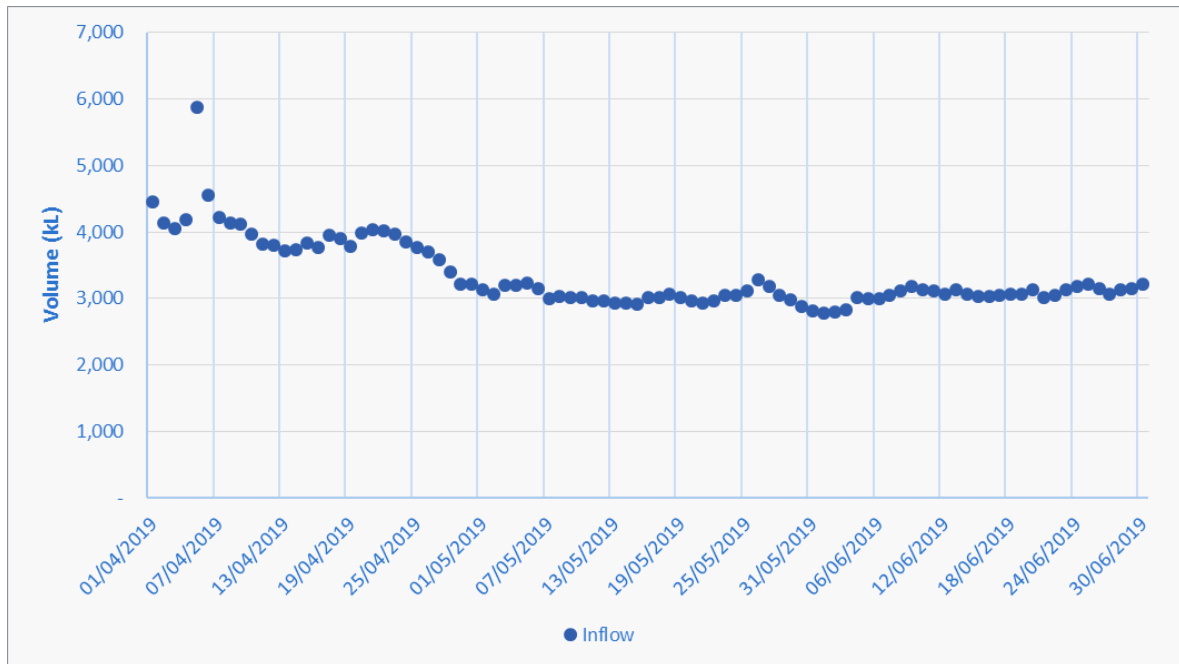


Fig 9. Port Douglas Daily Inflow

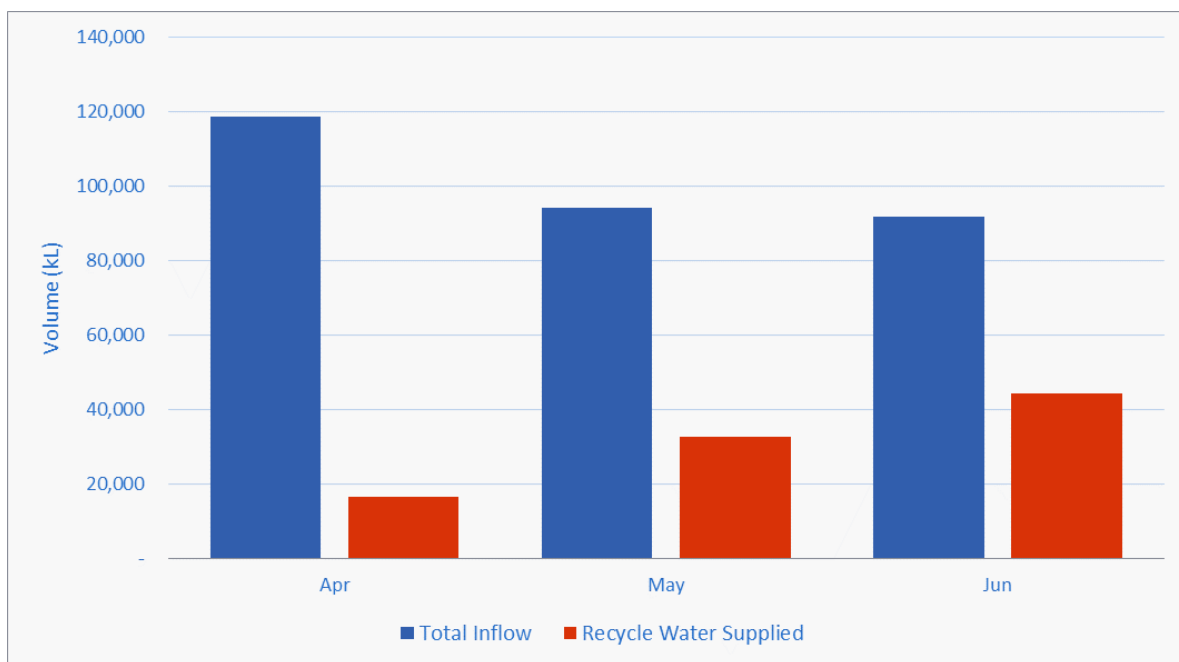


Fig 10. Port Douglas Total Monthly Flow 2019

Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 127,646 kL during the reporting period. The average daily flow was 1,403 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River. A total of 424.5 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 73 mm on 1 April 2019 from the South Mossman weather station.

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

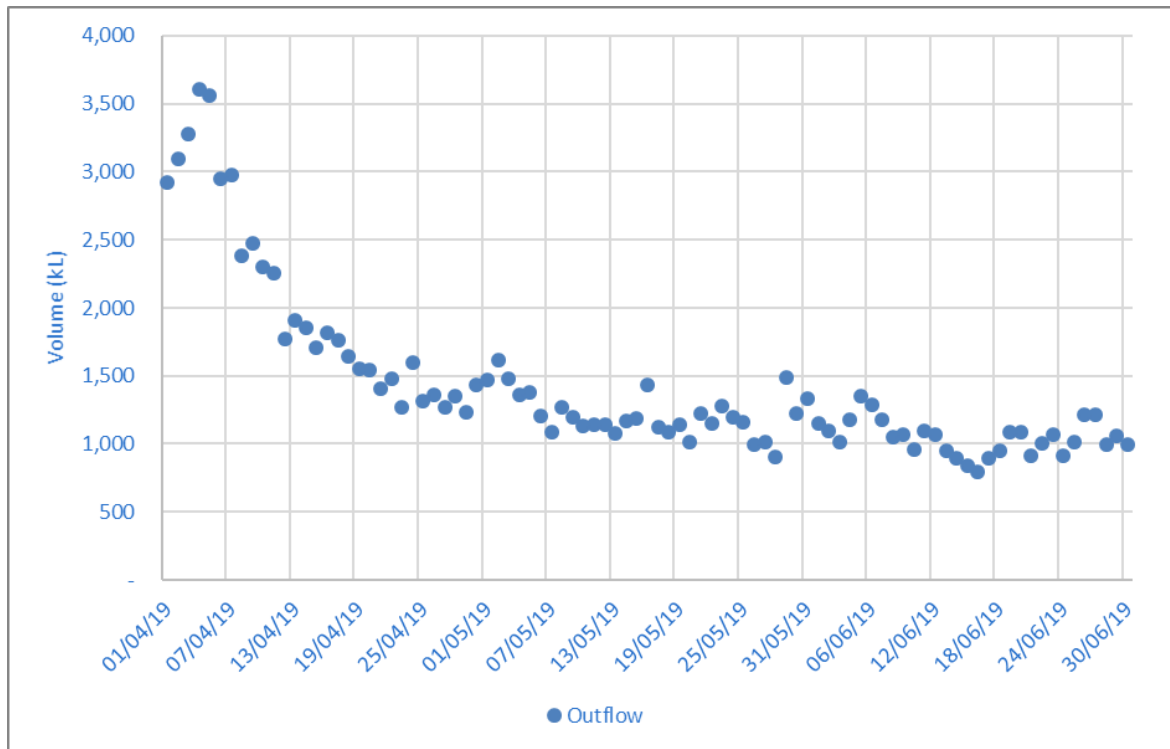


Fig 11. Mossman Wastewater Treatment Plant Daily Outflow

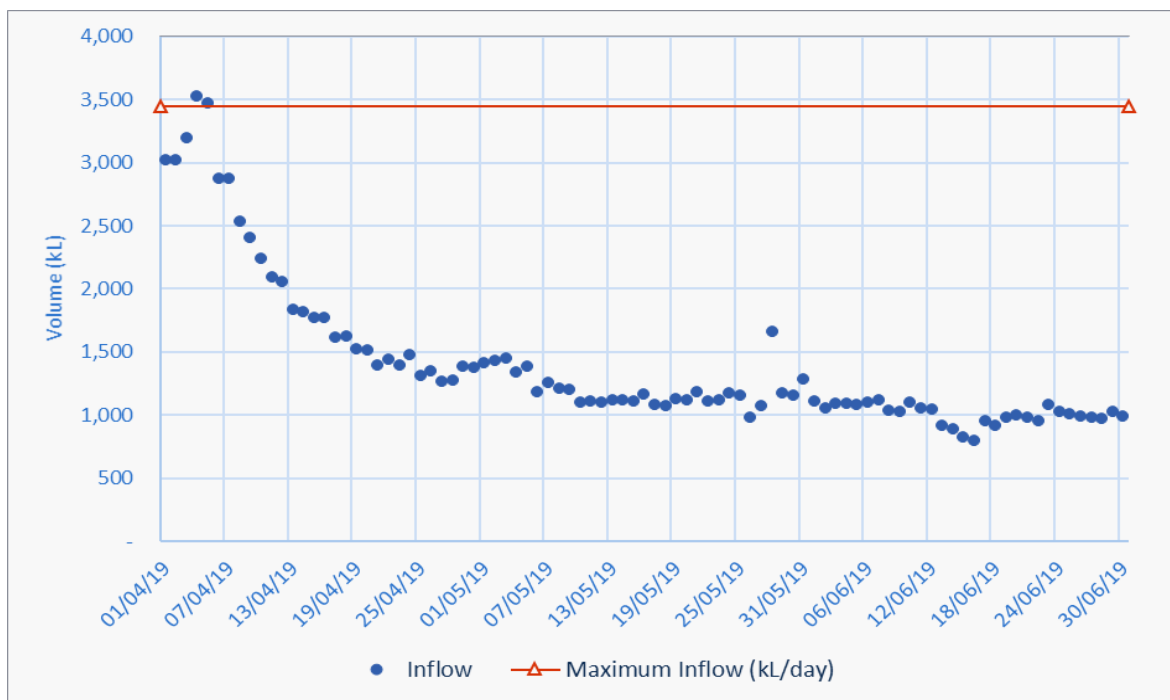


Fig 12. Mossman Wastewater Treatment Plant Total Daily Inflow 2019

5. Bio-solids Production

Bio-solids were produced at the dewatering plants at Mossman Wastewater Treatment Plant (12.6% solids) and Port Douglas Wastewater Treatment Plant (11.4% 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, 409 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 40.6 dry tonnes.

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

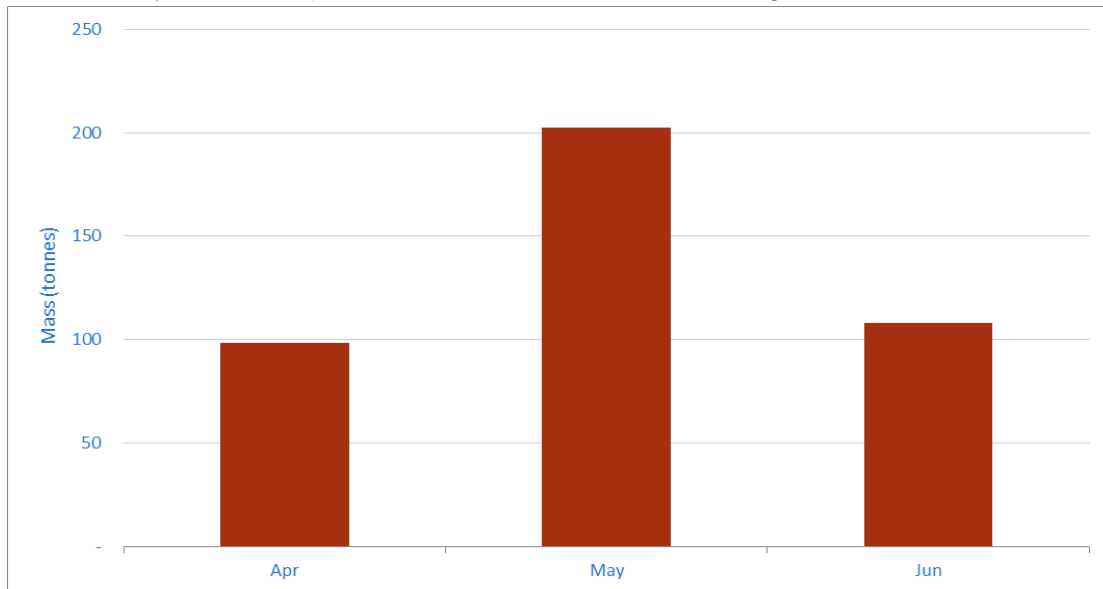


Fig 13. Port Douglas Wastewater Treatment Plant monthly bio-solids production 2019

Mossman Wastewater Treatment Plant

At Mossman Wastewater Treatment Plant, 81.46 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 10.26 dry tonnes.

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

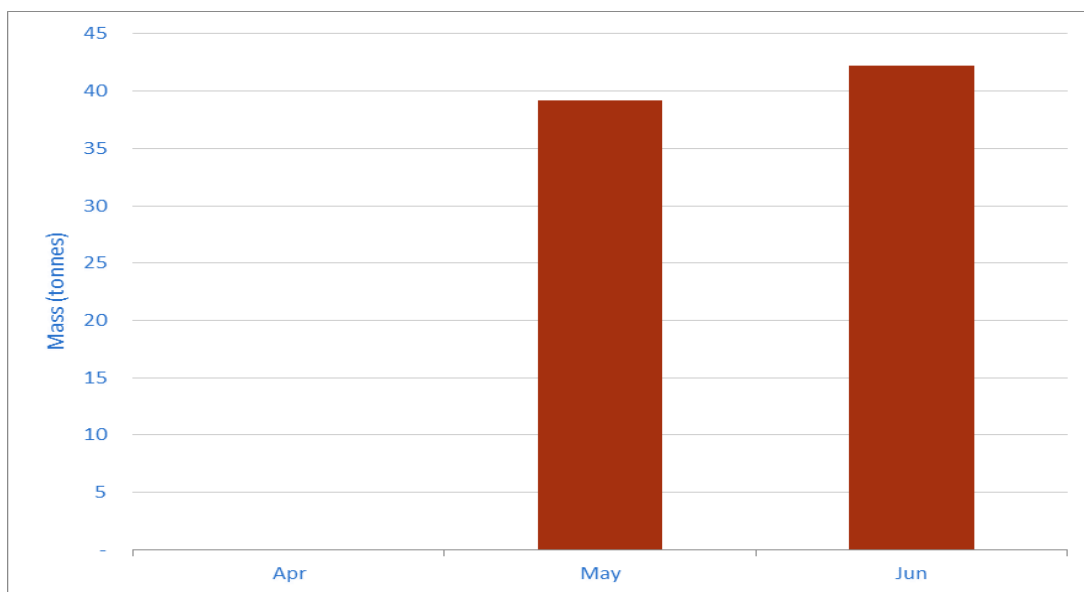


Fig 14. Mossman Wastewater Treatment Plant monthly bio-solids production 2019
***No Bio-solids removed in April 2019.**

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 were taken from the treatment processes, bio-solids, receiving waters and bores. Samples were 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.

The process and compliance is monitored 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, and Total Suspended Solids & BOD₅) are shown in Figure 15, 16, 17 & 18.

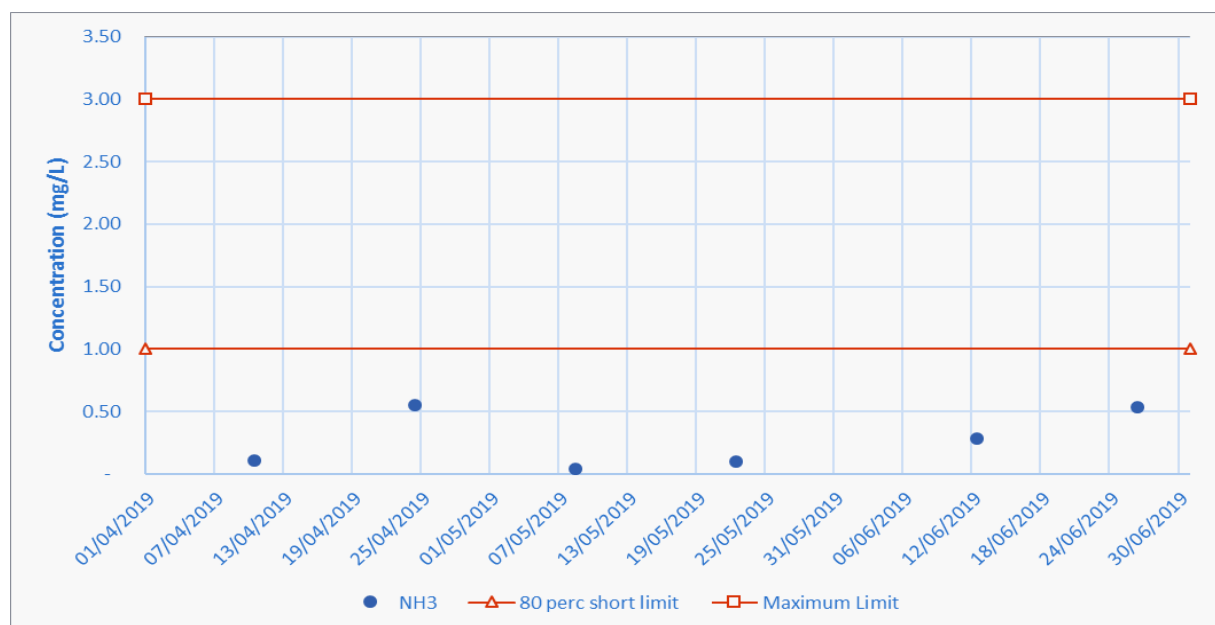


Fig 15. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Ammonia

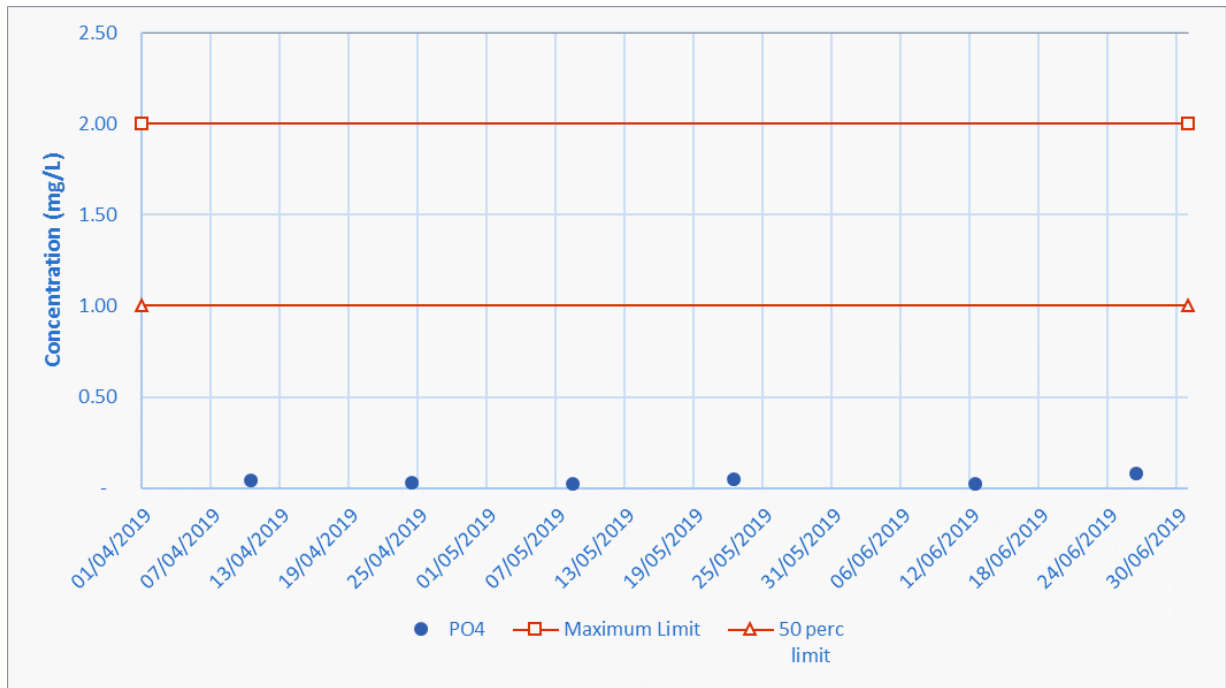


Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous

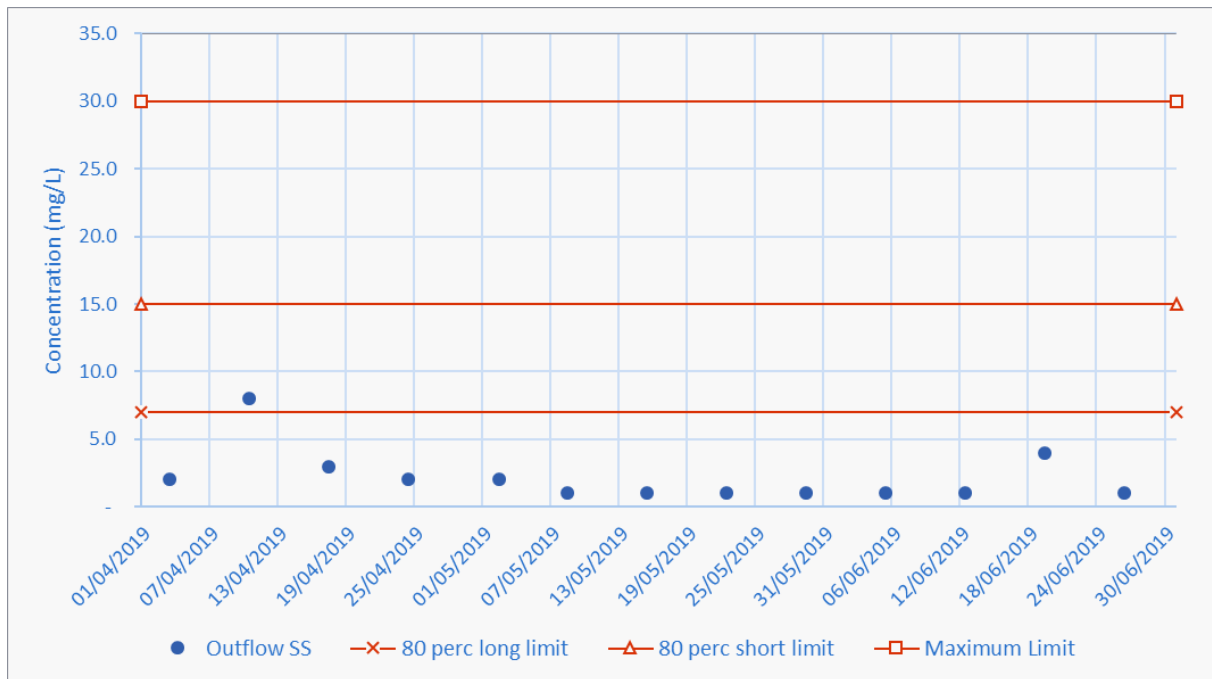


Fig 17. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids

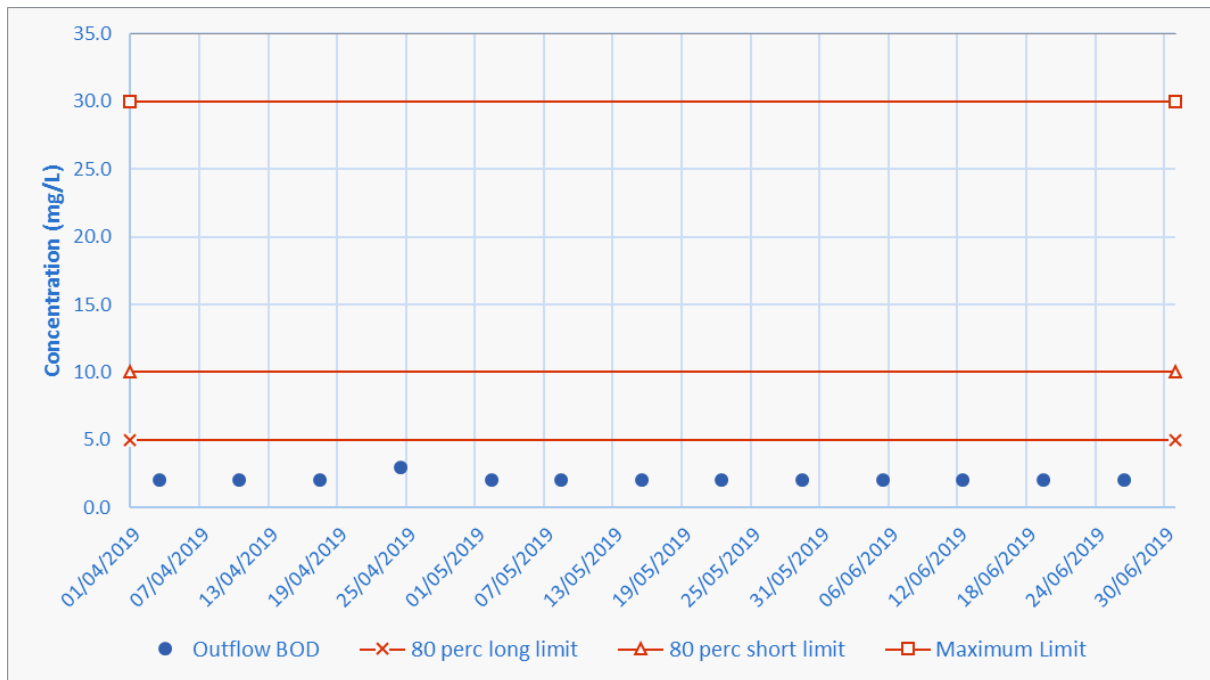


Fig 18. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD₅ (Biochemical Oxygen Demand)

Mossman Wastewater Treatment Plant

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids & BOD₅) are shown in Figures 19, 20, 21 & 22.

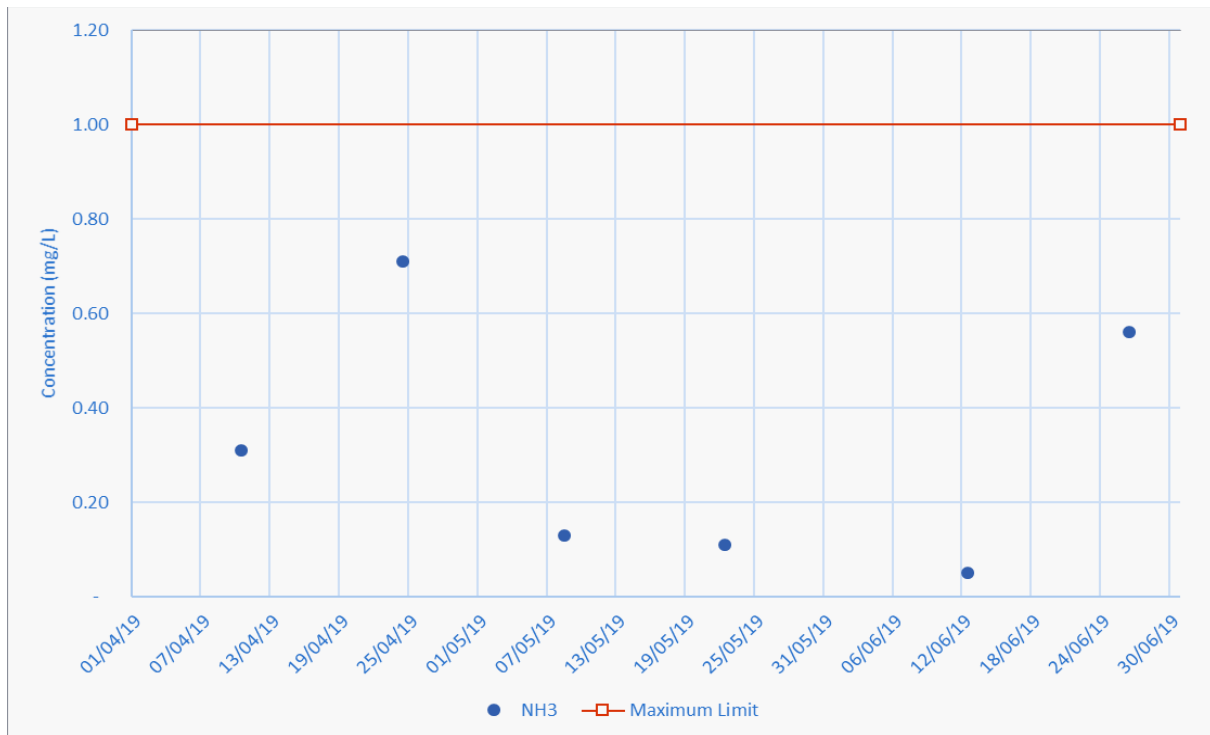


Fig 19. Mossman Wastewater Treatment Plant Final Effluent Test Results for Ammonia

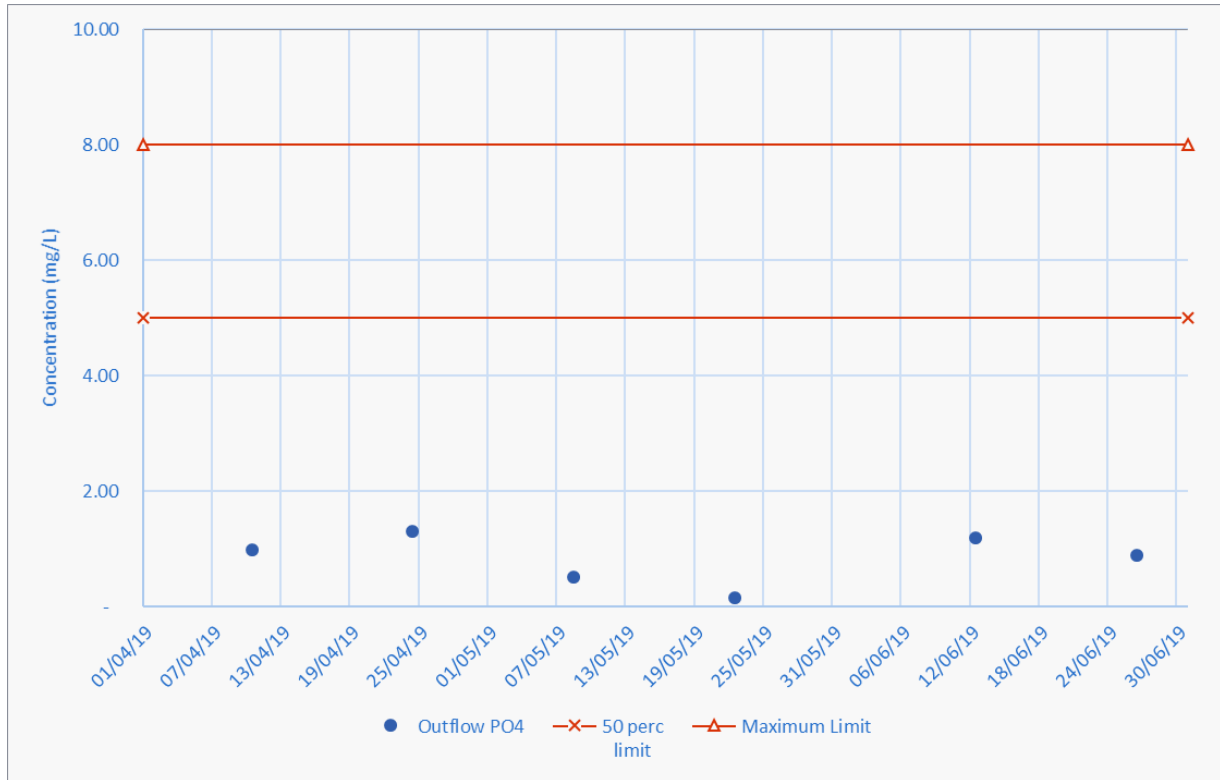


Fig 20. Mossman WWTP Final Effluent Test Results for Total Phosphorous

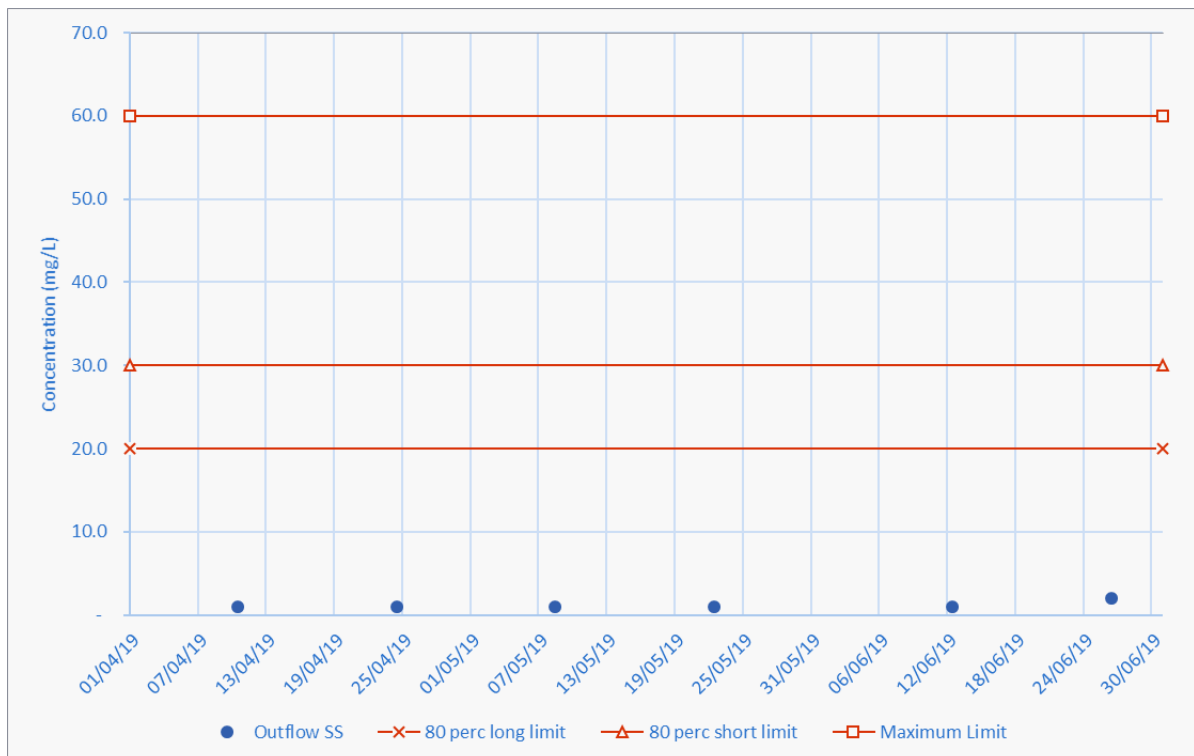


Fig 21. Mossman WWTP Final Effluent Test Results for Total Suspended Solids

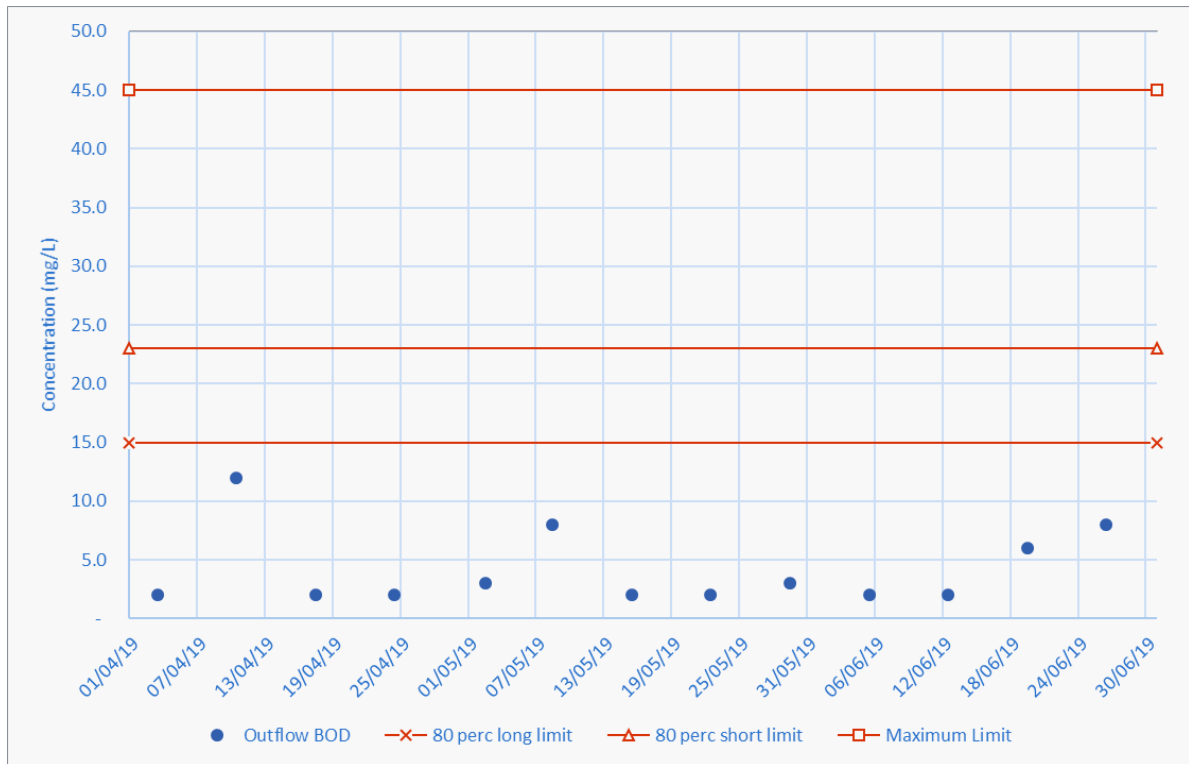


Fig 22. Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD₅ (Biochemical Oxygen Demand)