5.6. WATER AND WASTEWATER QUARTERLY REPORT FOR PERIOD ENDING 30 SEPTEMBER 2019

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DEPARTMENT	Water and Wastewater

RECOMMENDATION

That the Quarterly Report of the Water and Wastewater branch for the period ending 30 September 2019 be received and noted.

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 Branch for the period 01 July 2019 to 30 September 2019.

Whilst the results are generally positive the areas for improvement are noted and will be the focus of the branch over the next quarter. The 2019/2020 capital works program is well under way and works are progressing in all areas within Water and Wastewater.

BACKGROUND

This report is the first Quarterly Report submitted by the Water and Wastewater Branch during the 2019/2020 Financial Year. This report highlights progress against key performance areas required by the Department of Natural Resources, Mines and Energy and required compliance levels by the Department of Environment and Science.

COMMENT

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

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 branch 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 recognise 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 2019-2020 Actions:

3.2.4 *- Conduct a solar energy feasibility study for the Port Douglas Waste Water Treatment Plant.*

3.3.1 *- Continue upgrades to sewer network.*

3.3.2 *- Implement smart meters for water trial.*

3.3.3 *- Complete improvements to the Daintree water intake.*

5.3.4 *- Develop a Water Leaks policy.*

5.4.1 *- Install new infrastructure throughout Shire to allow for increased intelligence on rainfall and transport.*

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 Natural Resources, Mines and Energy and the Department of Environment and Science.
Community:	Nil

ATTACHMENTS

1. Water and Wastewater Quarterly Report for the period ending 30 September 2019 [**5.6.1** - 18 pages]

1 July – 30 September 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. 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 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	137
New Water Services Connections	8
Service Repairs	129
Water Mains Repairs	14
Water Quality Notifications (Complaints)	3 (1)
Dial before you dig	201
Flushing Events: Mossman/Port Douglas/Cooya/ Newell	2
Flushing Events: Whyanbeel/Wonga	0
Flushing Events: Daintree	0

There were three water quality notifications and one complaint during the reporting period. Although all water quality complaints and notifications are handled under customer service standards, there was one unsatisfied customer in this reporting period. Water and Wastewater team views all water quality notifications and complaints seriously and endeavour to achieve outcomes where customer satisfaction is priority.

Table 2 below details the nature of the notification, 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 Notificaitons

Address	CRM No & Date	Nature of water complaint	How it was resolved	Response Time
26-28 Coral Sea Dr, Mossman Gorge	75211/2019 28/08/2019	Tap water was discoloured	Water main was flushed, residual tested with a good residual value. Customer satisfied with the outcome.	10 mins
20 Brolga St, Craiglie	74885/2019 19/08/2019	High chlorine	Water was tested with normal chlorine residual. Reservoir chlorine level data was checked for the previous weeks prior to complaint. No anomalies recorded. Advised customer to contact Council if further issues occur.	5 mins
31 Kingston Rd, Whyanbeel	74778/2019 14/08/2019	Tap water was discoloured and cloudy	Water main system was full of air, water mains were flushed and customer satisfied and happy with the outcome.	15 mins
7 Gorge View Cres, Mossman Gorge	74662/2019 12/08/2019	Tap water was discoloured	Water main was flushed, water quality tested and water was clear. Customer satisfied with the outcome.	30 mins

The 2019/2020 capital works program is well underway and works are progressing as scheduled within water quality and reticulation. Quotes, contracts and purchasing of new assets are currently being obtained for water network service renewals and design assessments.

2. Water schemes and potable water consumption

Water Restrictions

This reporting period, is our winter dry season, all intakes levels have been on a steady decline but remained adequate for consumer demand. There were no water restrictions for most of this reporting period, however the month of September exhibited a lack of rain and the climate forecast outlook indicated a below than average rainfall. Council activated level 1 water restrictions on 23 September 2019 within the Douglas Shire. There were no water licence exceedances during this reporting period.

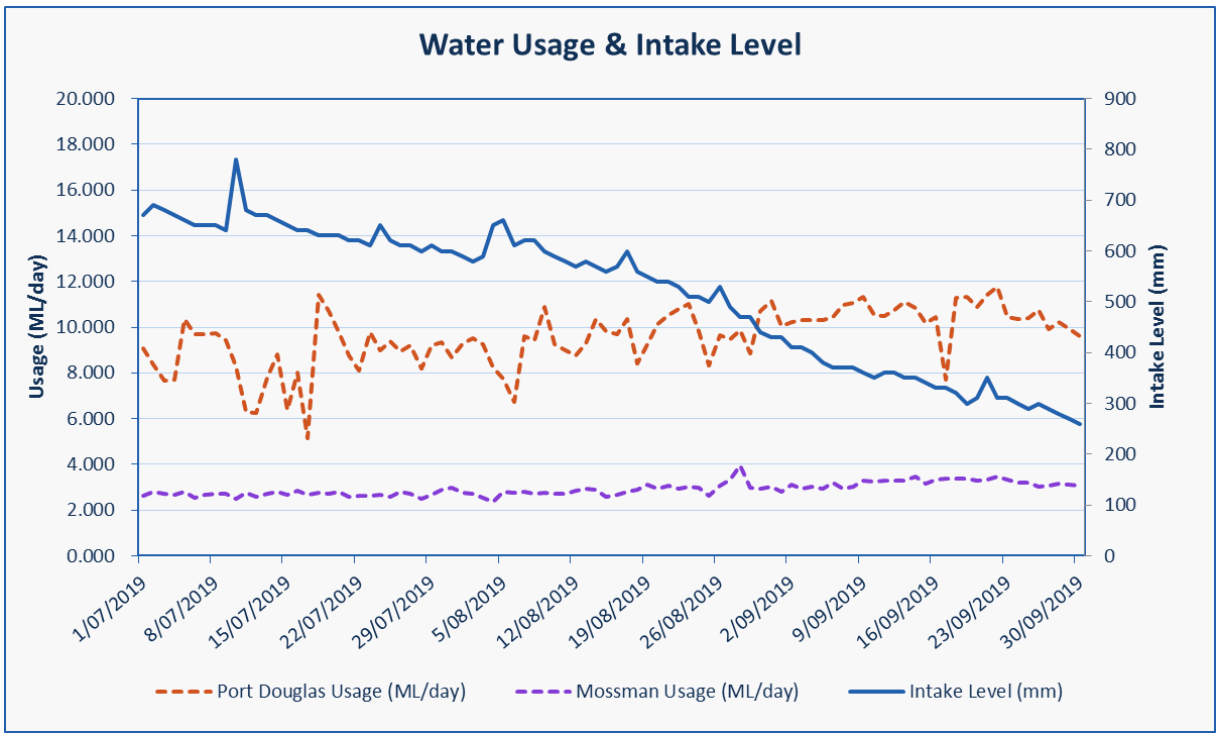

Fig 1. Mossman and Port Douglas water usage and Rex Creek intake levels for the period 1 July 2019 – 30 September 2019

All Schemes

Raw water quality has been good throughout all schemes 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 pumps were removed for inspection and repair. Road tankers were used to transport potable water to fill the De Meio reservoir and operate at normal production. Craiglie reservoir has been taken offline for repairs to the structural steel work and roof sheeting. 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. The higher demand and associated reduced intake level at Rex Creek has resulted in the Mossman Water Plant production flows come close to the maximum licence extraction limits. Developing weather conditions in the next quarter will dictate the need for further water restrictions and influence plant operations.

All Ultra Filtration (UF) racks were operational and maintenance works continued with cartridge repairs to ensure compliance with UF rack integrity test limits.

General maintenance works and service inspections continue across all water plants.

The backwash recovery plant is still in the final stages of commissioning and performance testing. The discharge flows are being monitored for licence compliance.

Mossman Water Supply

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

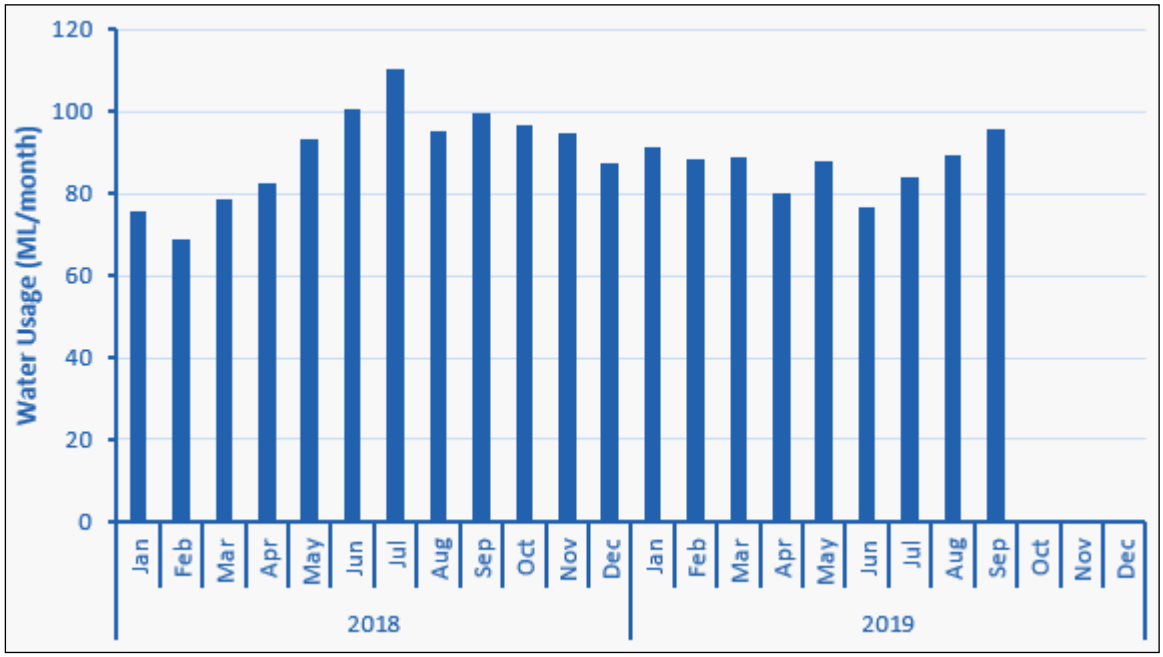

Fig 2. Mossman Scheme Total Monthly Consumption Figures

Port Douglas Water Supply

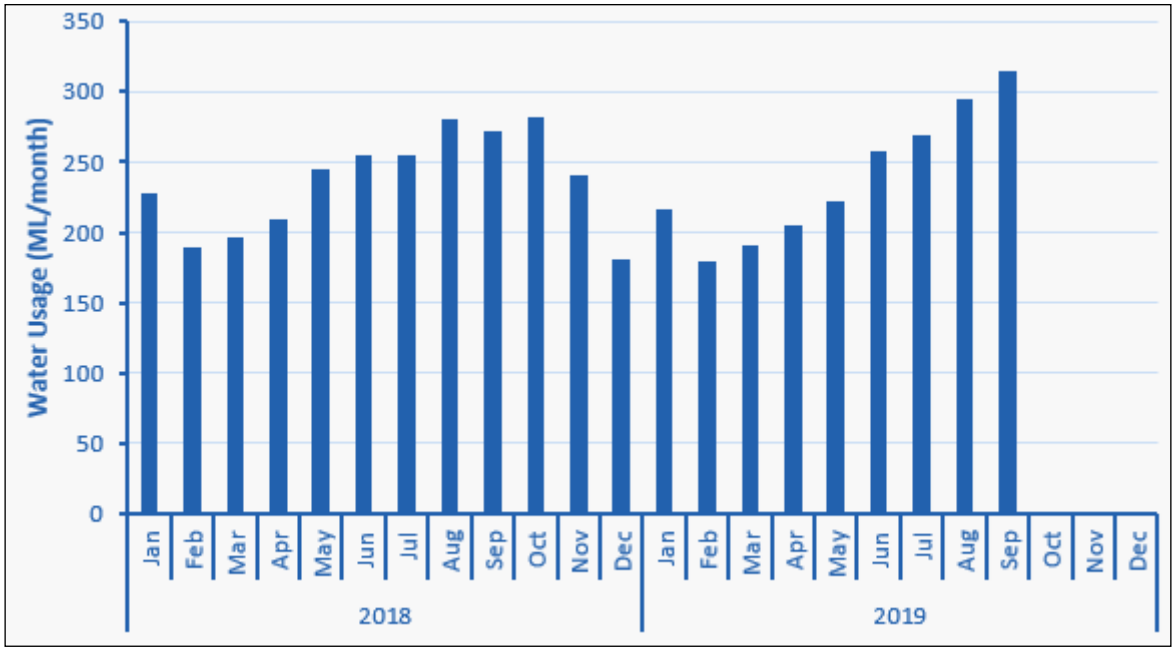

Fig 3. Port Douglas Scheme Total Monthly Consumption Figures

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 was completed at the end of August 2019. 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 service and maintenance work continued.

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

Whyanbeel Water Supply

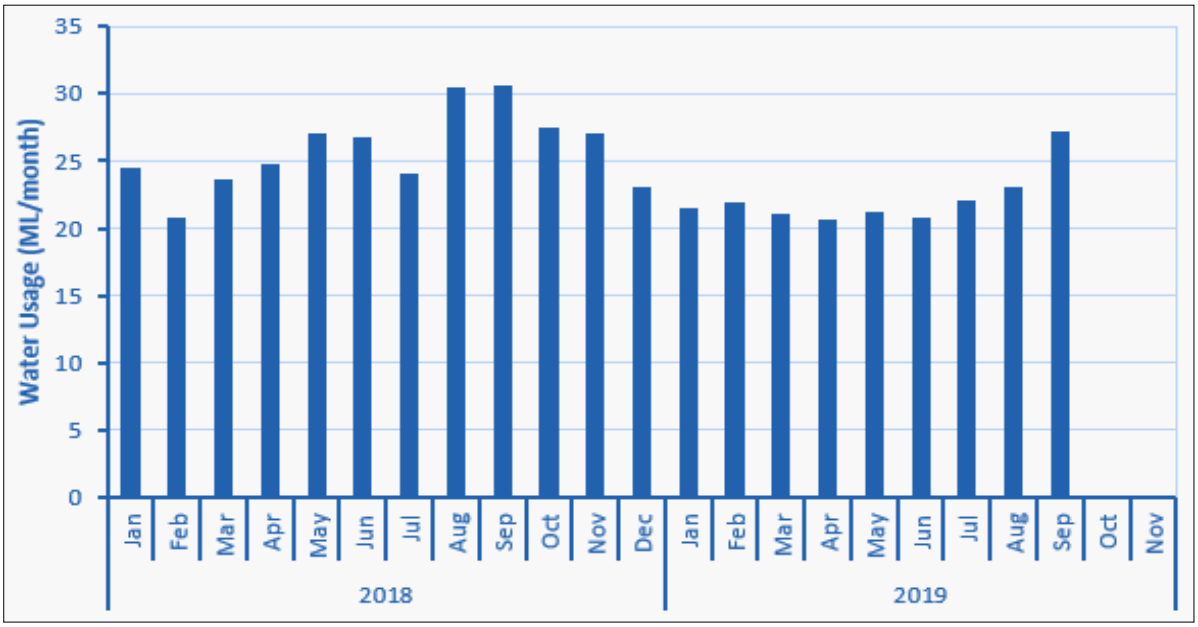

Fig 4. Whyanbeel Scheme Total Monthly Consumption Figures

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.

Water quality testing is continuing on the new Daintree bore field extraction pumping station.

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

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

Daintree Water Supply

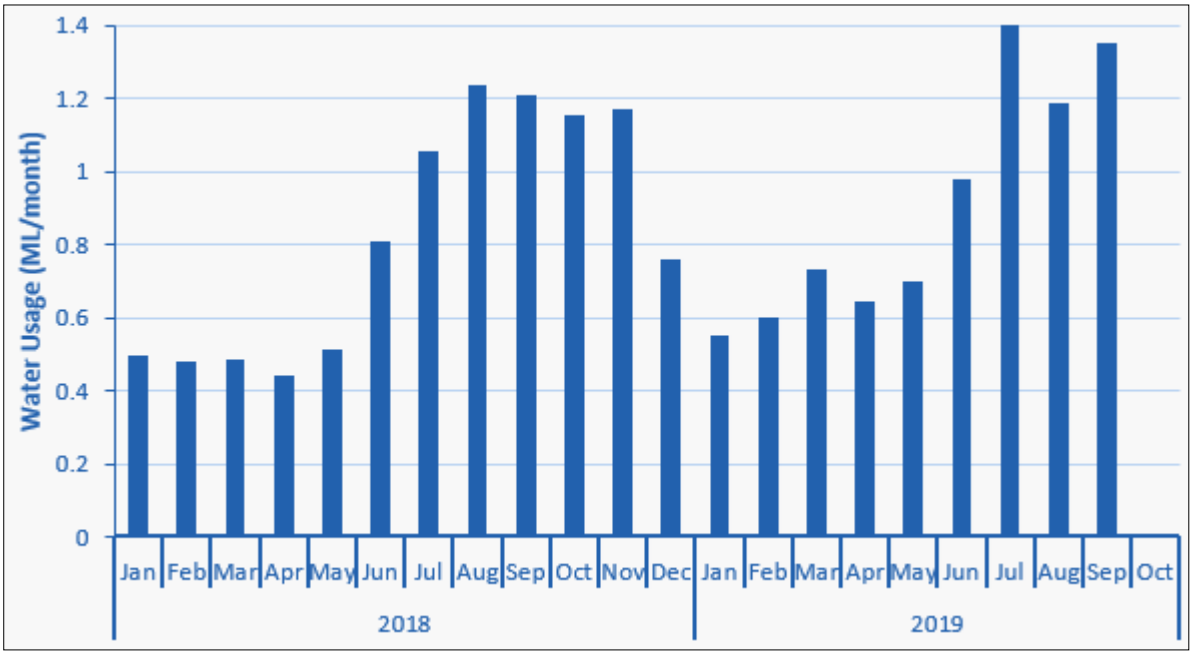

Fig 5. Daintree Scheme Total Monthly Consumption Figures

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 74 treated water E.coli compliance samples were taken in the three drinking water schemes. A total of 25 E.coli samples were tested in the Douglas water laboratory and 49 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 12 raw water E.coli samples. Raw water sampling assists us to understand the treatment plant needs and the health based targets.

During September, the Council started utilising Cairns Regional Council NATA Laboratory for sample analyses. Prior to this the Council utilised SGS NATA laboratory.

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 July to September 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
July-19	7.0	23	7	1.1	1.1	<1
Aug-19	7.0	22	6	1.0	1.0	<1
Sept-19	7.3	23	4	1.1	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
July-19	6.8	23	0.9	1.0	<5	0.008	0.005	<0.005	<1
Aug-19	6.8	23	0.9	1.0	<5	0.009	0.009	<0.005	<1
Sept-19	6.7	24	1.6	1.1	<5	0.009	0.033	<0.005	<1

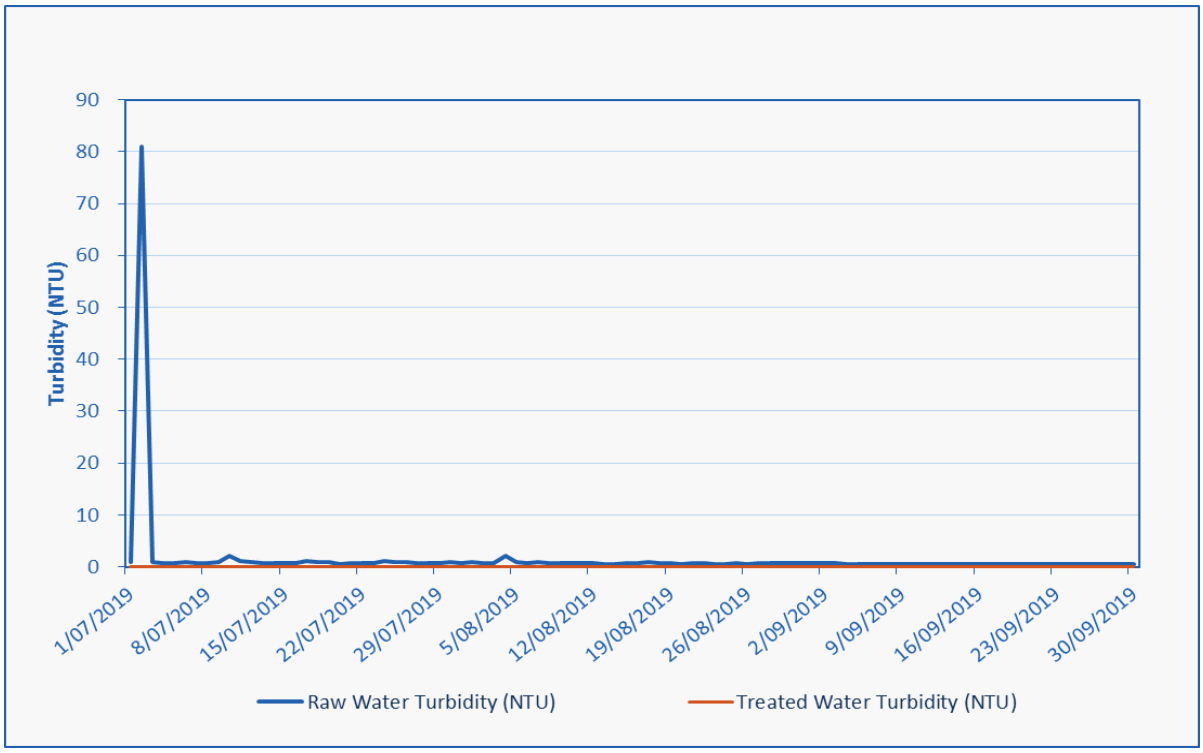

Fig 6. Turbidity trends at the Rex Creek intake and treated water at the Mossman Water Treatment Plant

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 July to September 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
July-19	7.8	24	13	1.1	1.1	<1
Aug-19	7.8	23	16	1.1	1.1	<1
Sept-19	7.5	30	12	1.0	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
July-19	7.7	22	0.3	0.3	<5	0.002	0.006	<0.005	<1
Aug-19	8.0	23	0.2	0.3	<5	0.003	0.008	<0.005	<1
Sept-19	8.4	24	0.2	0.3	<1	0.004	<0.008	<0.0002	<1

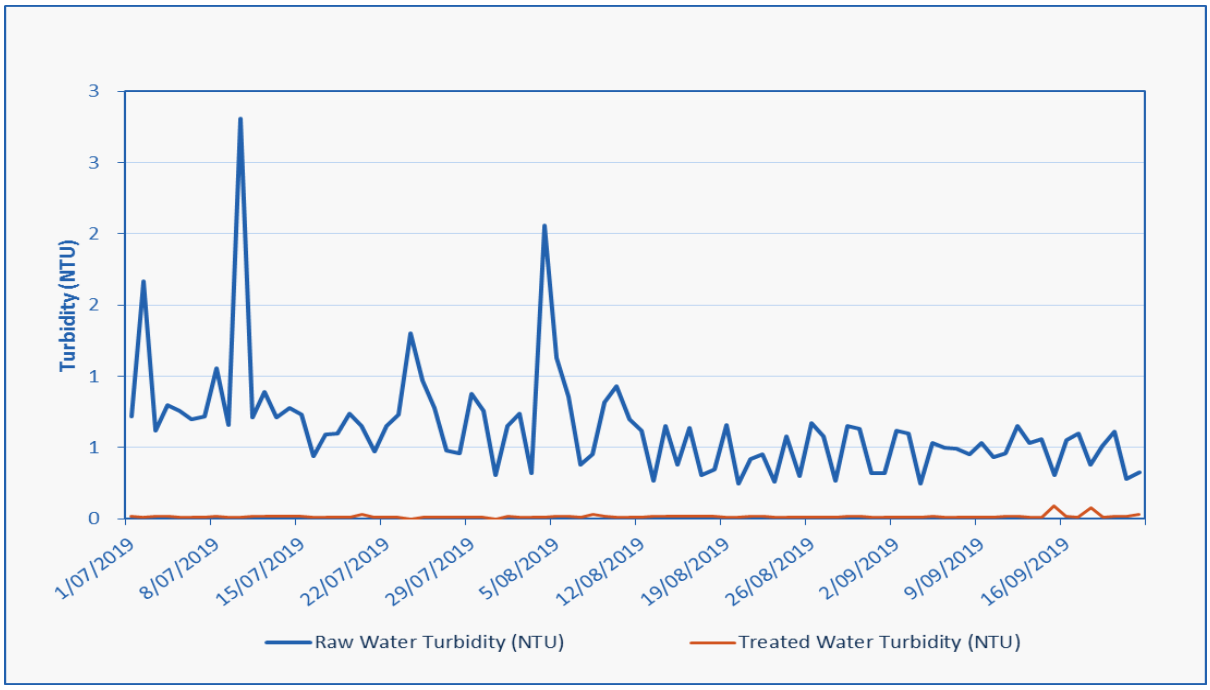

Fig 7. Turbidity trends at the Little Falls Creek intake and treated water at the Whyanbeel Water Treatment Plant.

Daintree Supply Scheme

Average monthly values for key operational and compliance parameters are detailed in Table 7 for treated water at Daintree Reticulation network. 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 July to September 2019.

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
July-19	7.6	24	1.0	1.0	<5	0.001	0.016	<0.005	<1
Aug-19	7.8	24	1.1	1.1	<5	0.002	0.022	<0.005	<1
Sept-19	7.8	24	1.0	1.0	<5	0.003	0.027	<0.005	<1

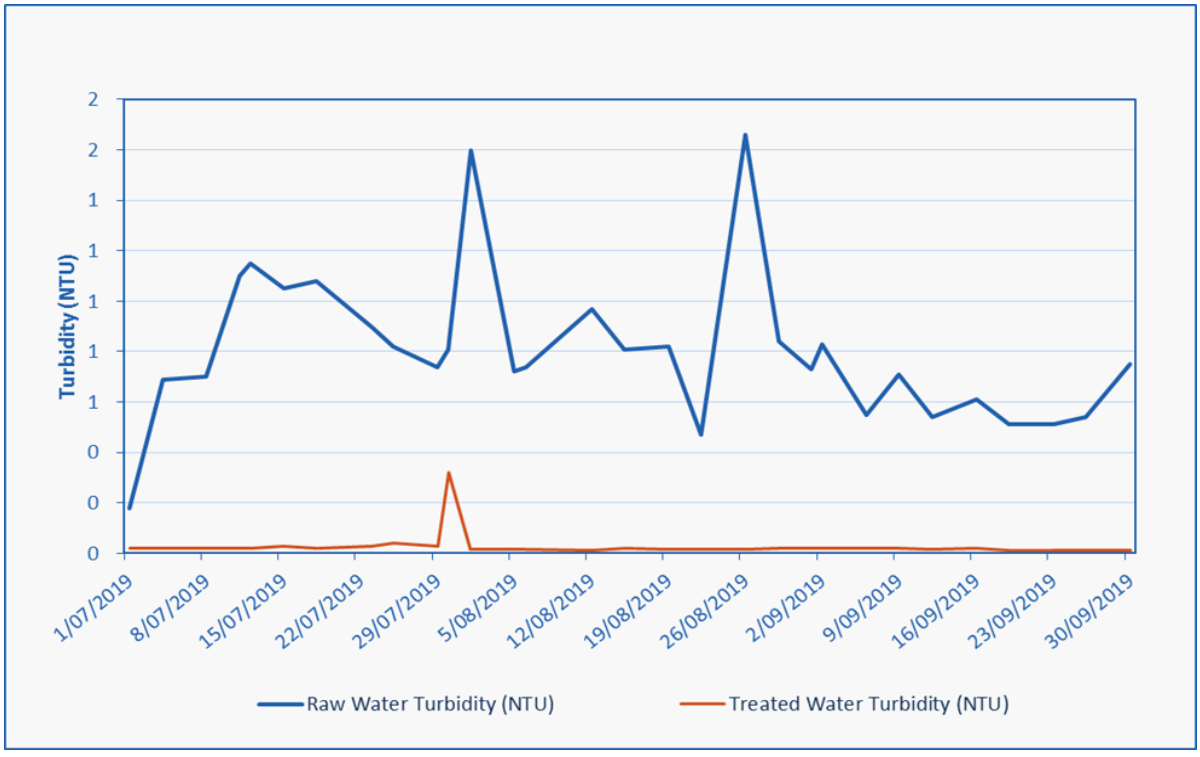

Fig 8. Turbidity trends at the Intake/Martin Creek intake and treated water at the Daintree Water Treatment Plant.

Wastewater

4. Wastewater reticulation services

General maintenance programs 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 heavy tourist period. The 2019/2020 capital works program has commenced with procurement and awarding of contracts well under way. Such as operational changes for the Mossman Wastewater Treatment Plant involving lining of the sludge lagoon and the sewer renewal programme to identify infiltration within the sewer network.

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	4	13
Sewer Chokes	2	1
Sewer Main Breaks	0	0
HCB Repairs (House Connection Branch)	2	0
Odour Complaints	0	0

Influent and irrigation flows

Port Douglas Wastewater Treatment Plant

A total of 282,211 kL of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average daily flow was 3,068 kL/day. Tanker truck contractors delivered 340 kL of septage to the plant and 2,650 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 43% of the treated effluent was pumped to two golf resort courses for irrigation purposes and the remaining discharged into the Dickson Inlet. The Sheraton Mirage received 96,278 kL and Palmer Sea Reef received 26,566 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 52 mm. On 10 July 2019, the highest rainfall on a day was recorded as 14 mm at Port Douglas Wastewater Treatment Plant.

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

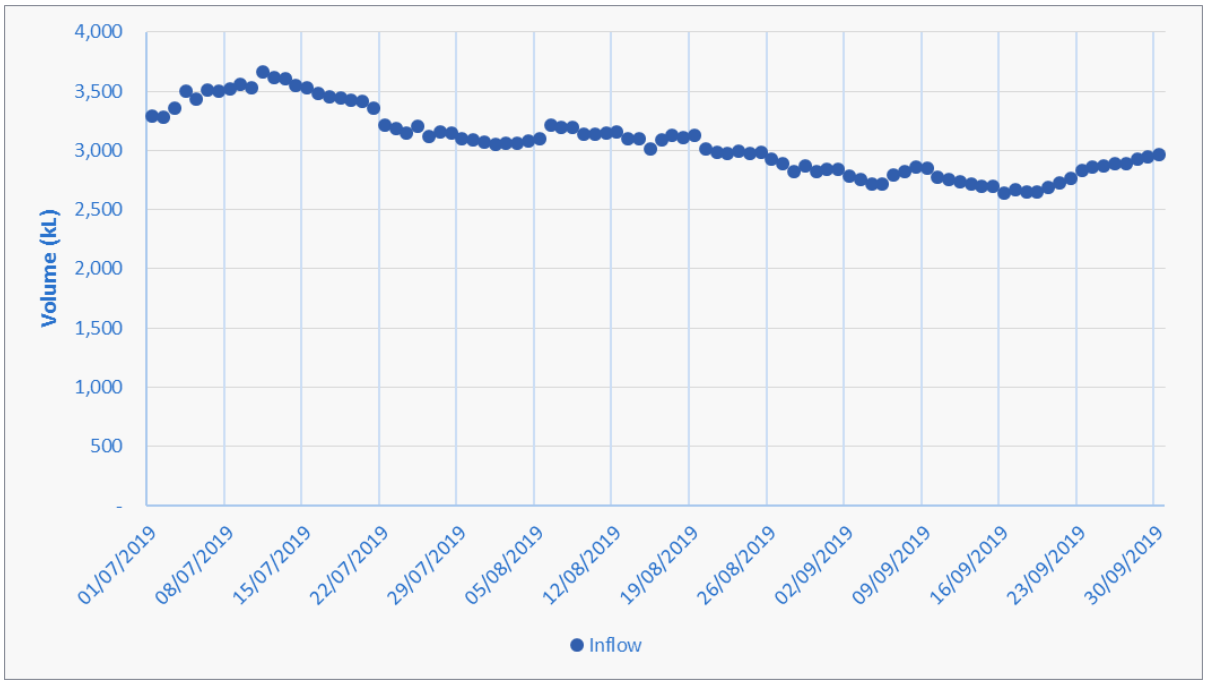

Fig 9. Port Douglas Daily Inflow

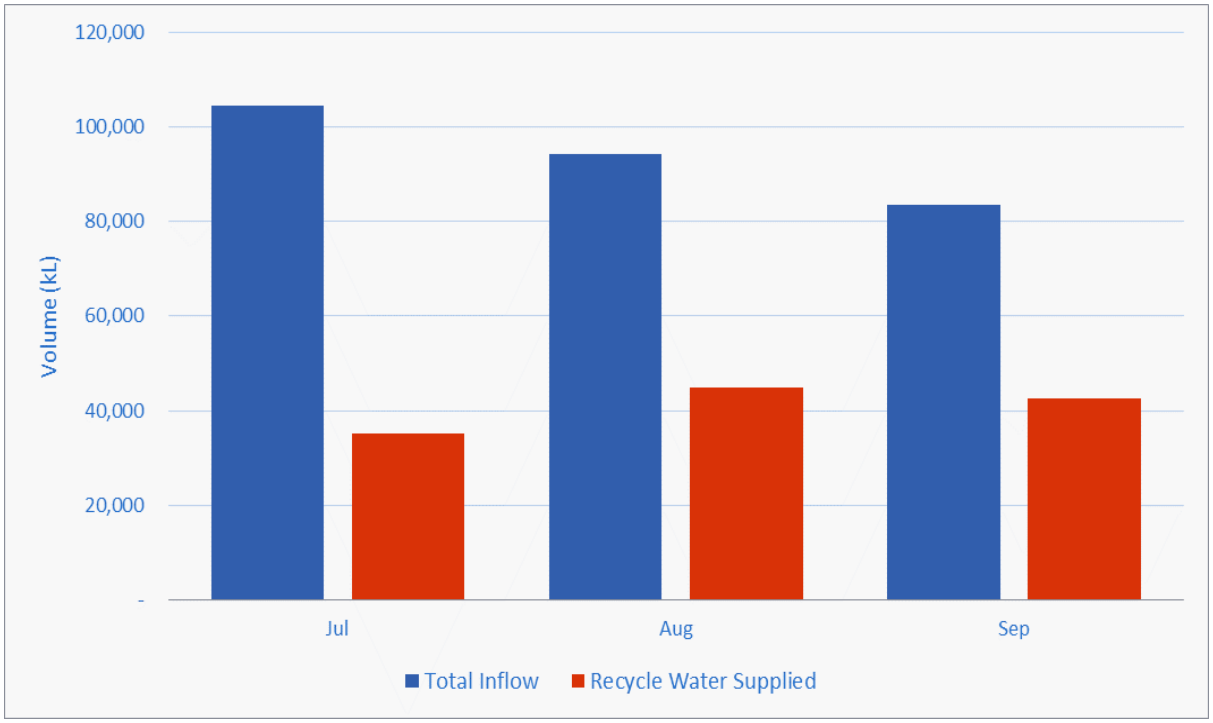

Fig 10. Port Douglas Total Monthly Flow 2019

Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 85,278 kL during the reporting period. The average daily flow was 927 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River. A total of 72 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 15 mm on 10 July 2019 at Mossman Wastewater Treatment Plant.

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

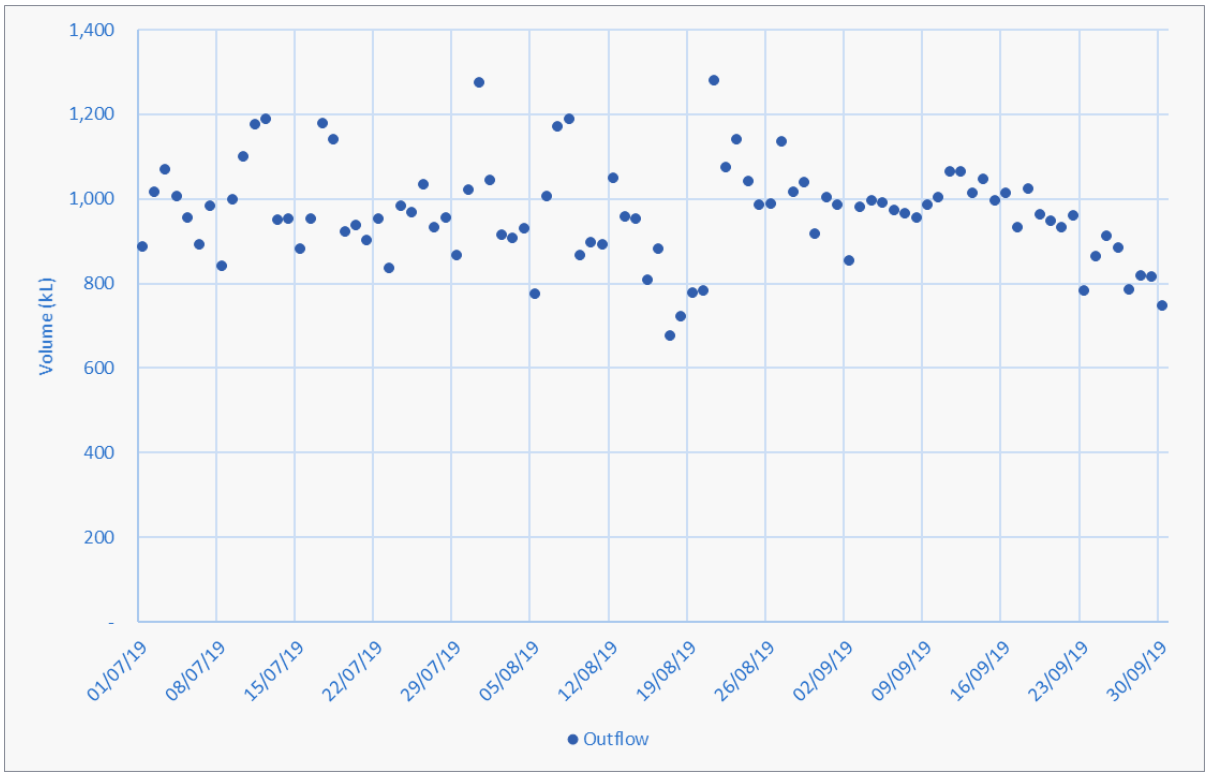

Fig 11. Mossman Wastewater Treatment Plant Daily Outflow

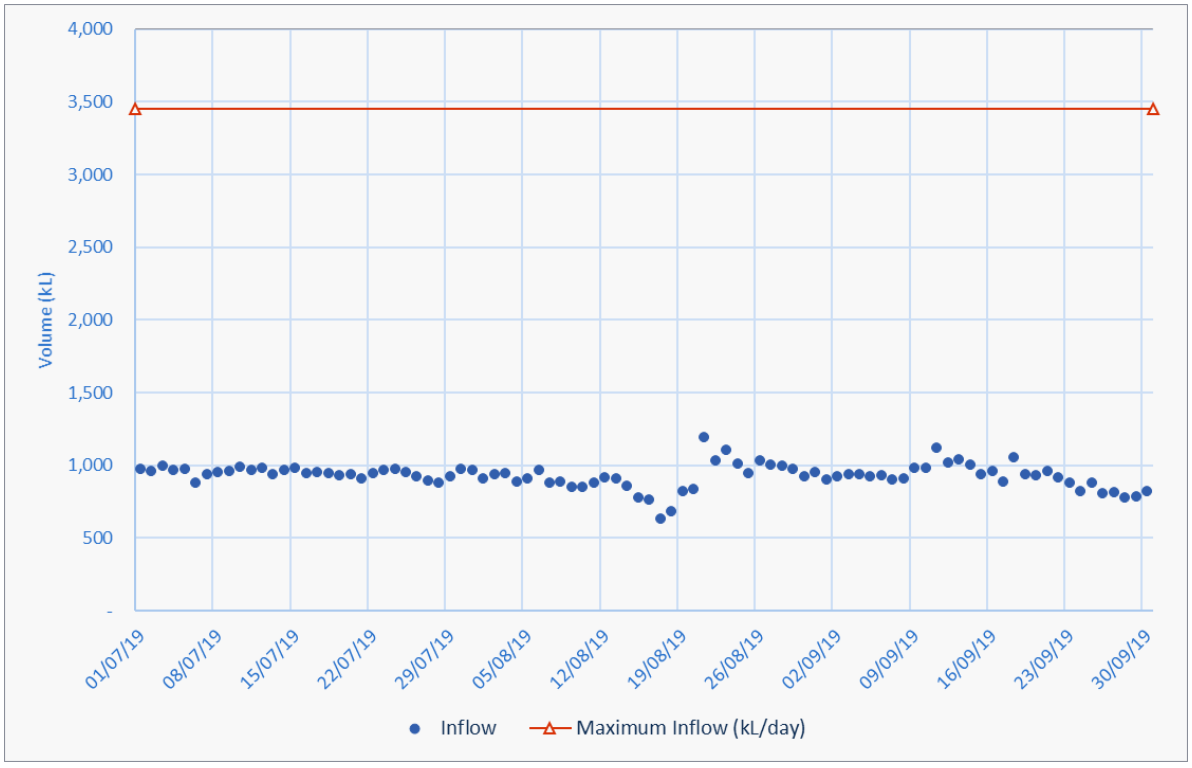

Fig 12. Mossman Wastewater Treatment Plant Total Daily Inflow 2019

5. Bio-solids Production

Bio-solids were produced at the dewatering plants at Mossman Wastewater Treatment Plant (12.2% solids) and Port Douglas Wastewater Treatment Plant (10.7% 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, 752.99 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 80.5 dry tonnes.

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

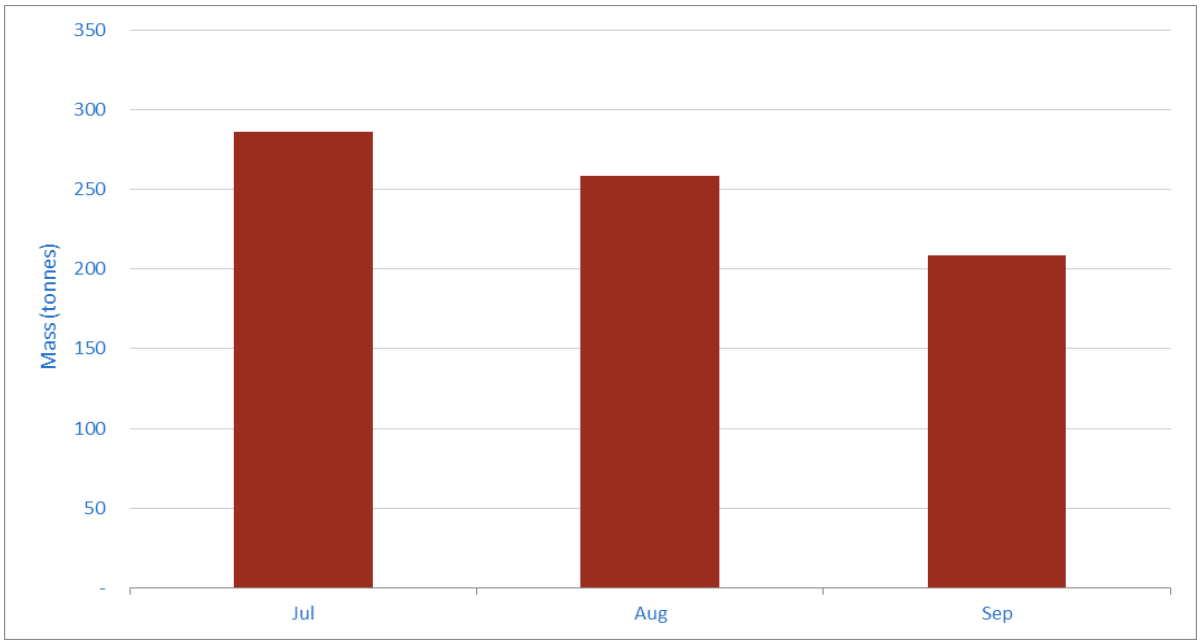

Fig 13. Port Douglas Wastewater Treatment Plant monthly bio-solids production 2019

Mossman Wastewater Treatment Plant

At Mossman Wastewater Treatment Plant, 150.70 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 18.39 dry tonnes.

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

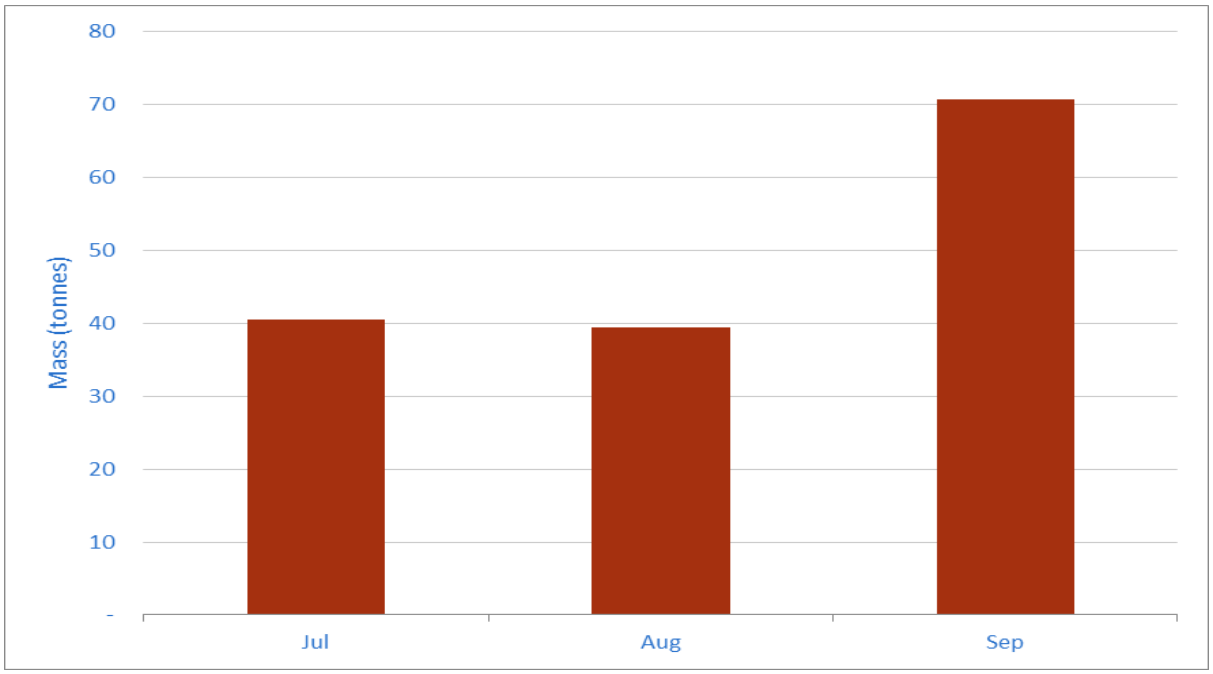

Fig 14. Mossman Wastewater Treatment Plant monthly bio-solids production 2019

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.

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 & BOD_5) are shown in Figure 15, 16, 17 & 18.

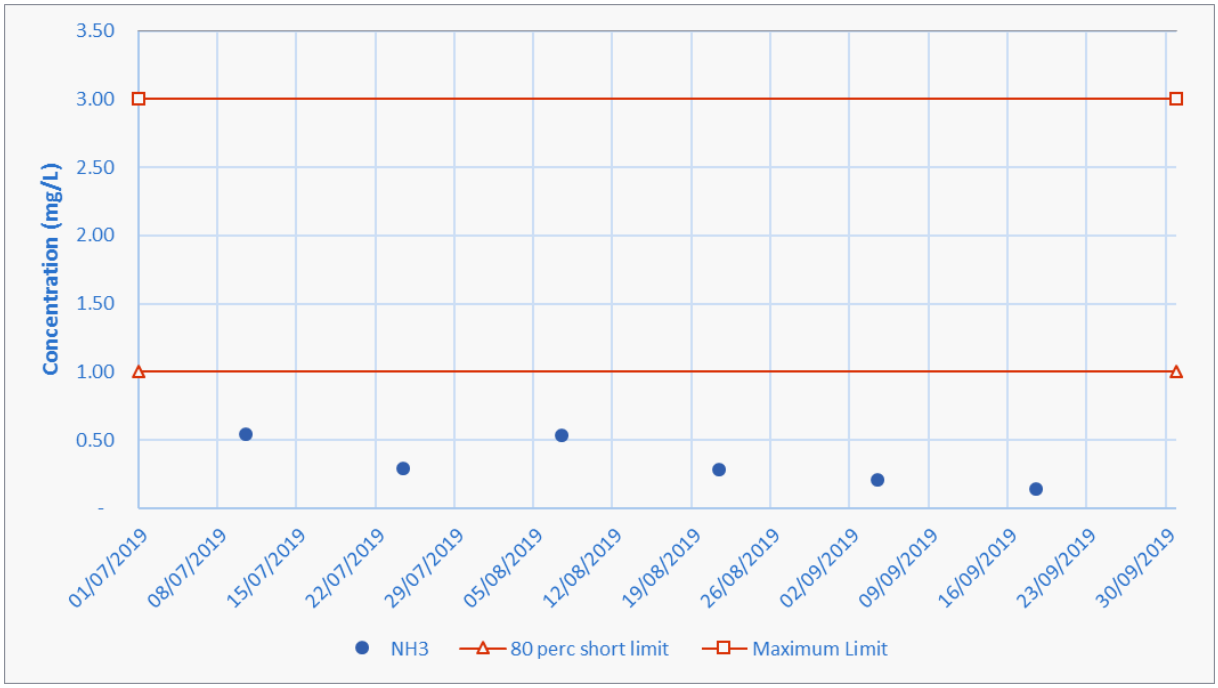

Fig 15. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Ammonia

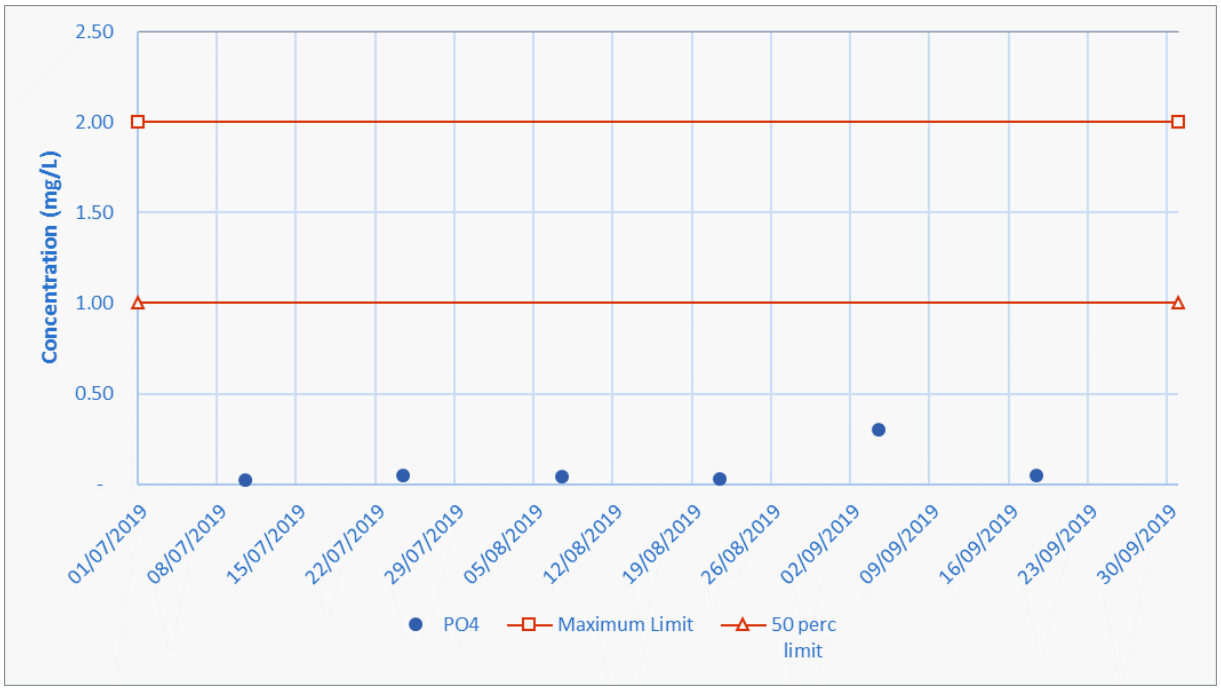

Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous

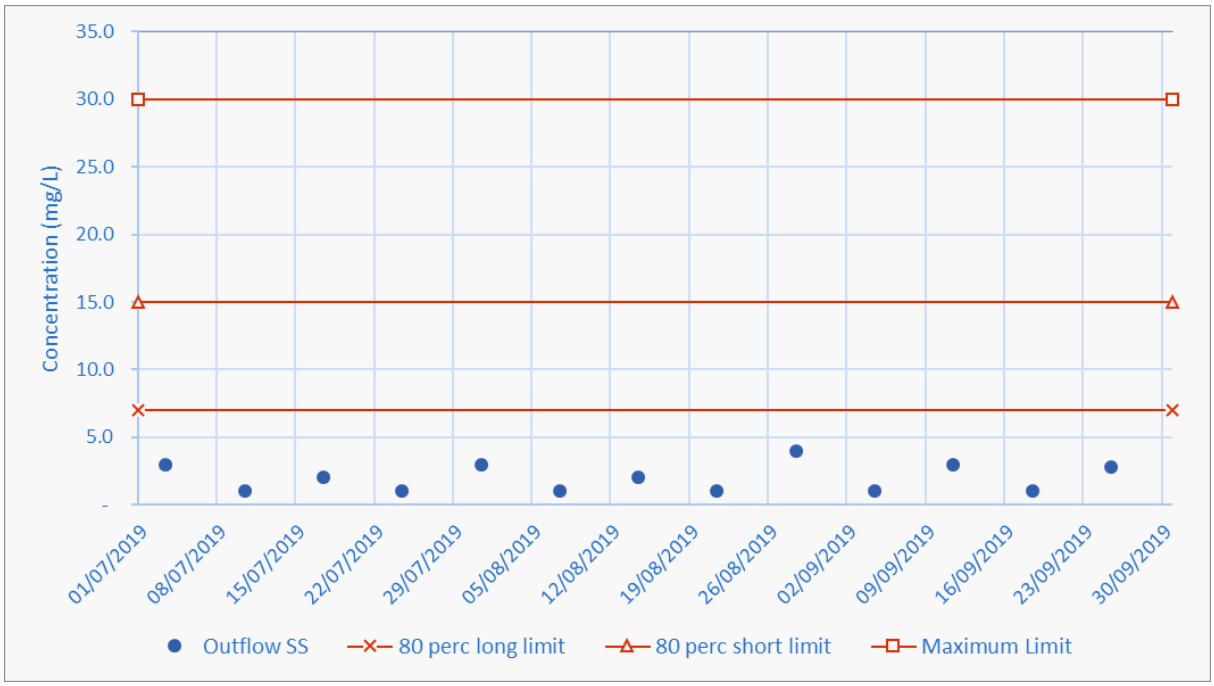

Fig 17. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids

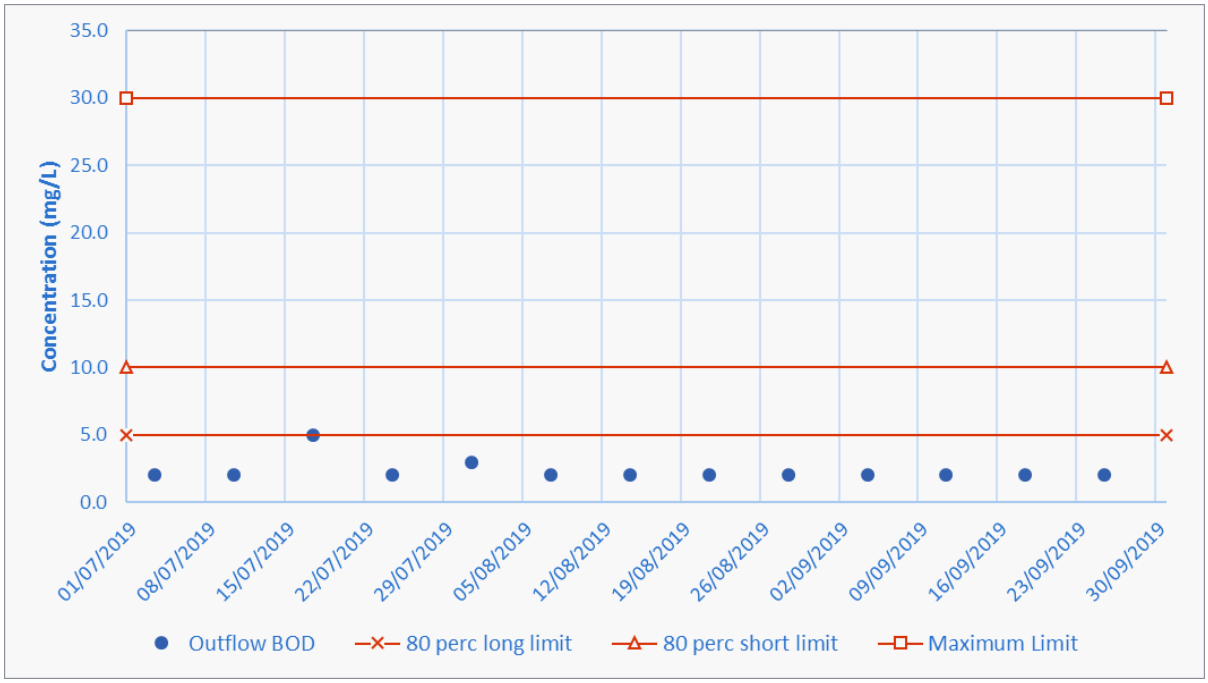

Fig 18. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)

Mossman Wastewater Treatment Plant

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids & BOD_5) are shown in Figures 19, 20, 21 & 22.

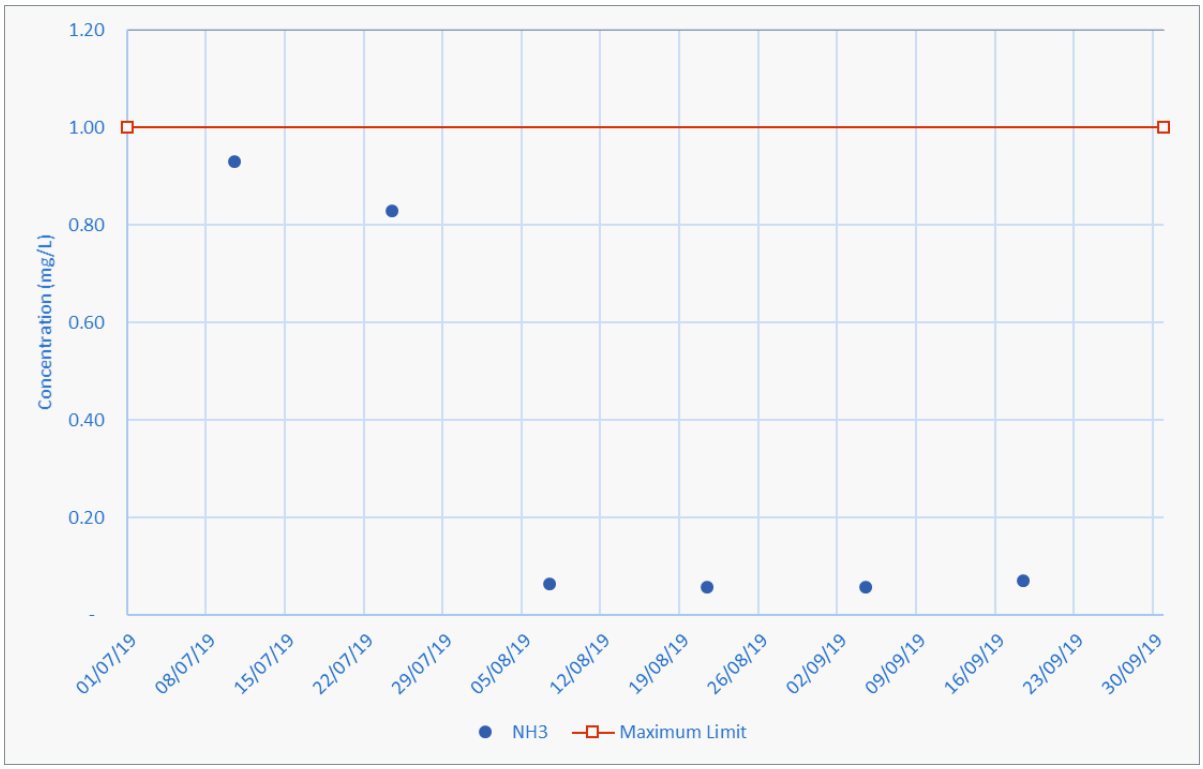

Fig 19. Mossman Wastewater Treatment Plant Final Effluent Test Results for Ammonia

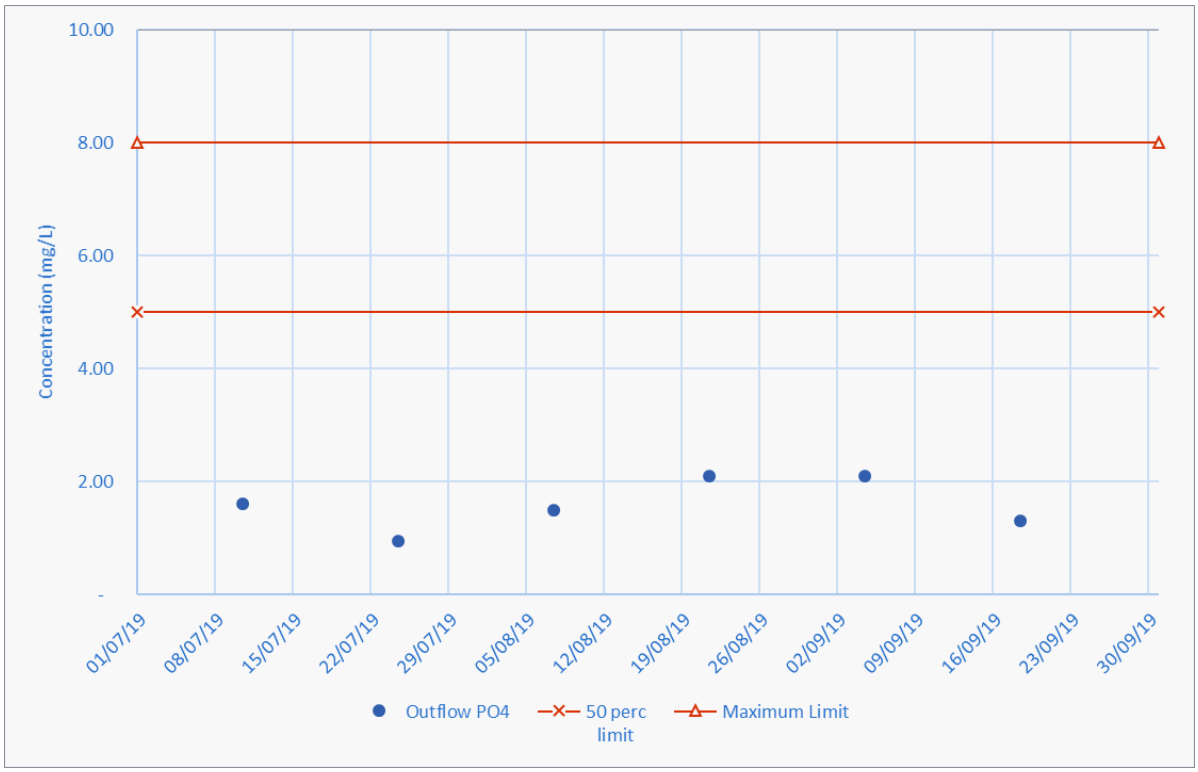

Fig 20. Mossman WWTP Final Effluent Test Results for Total Phosphorous

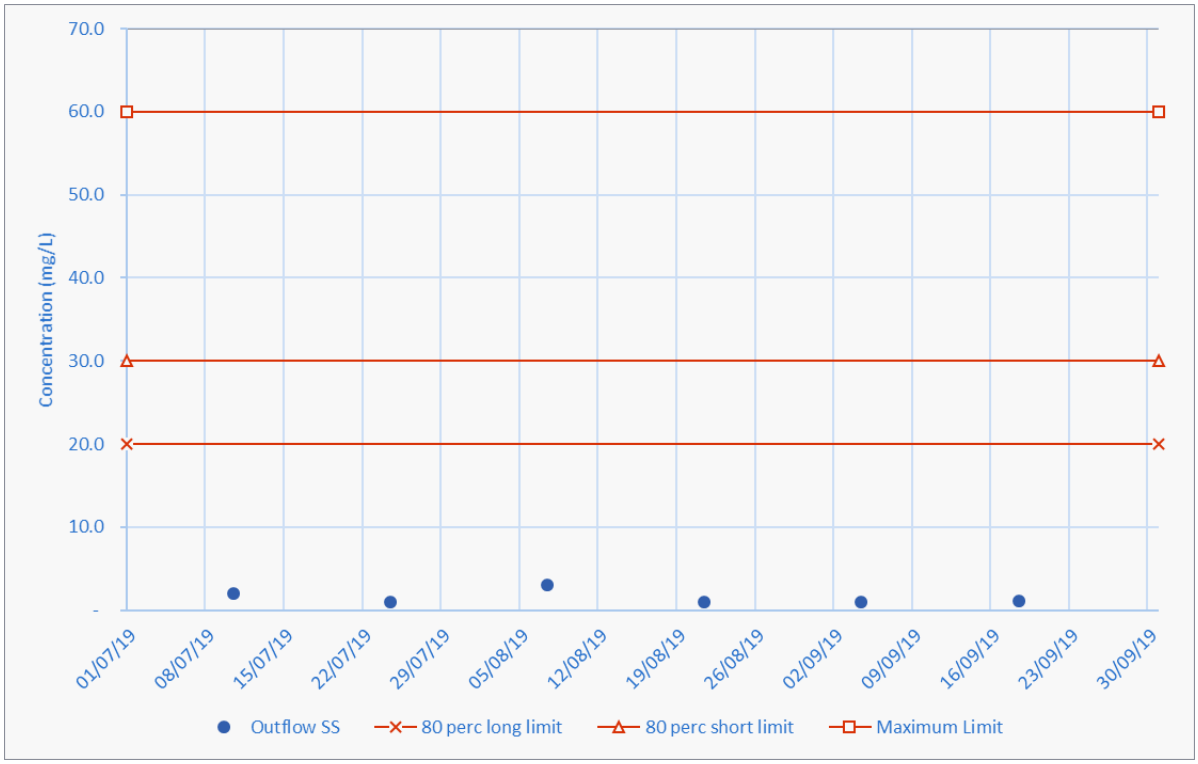

Fig 21. Mossman WWTP Final Effluent Test Results for Total Suspended Solids

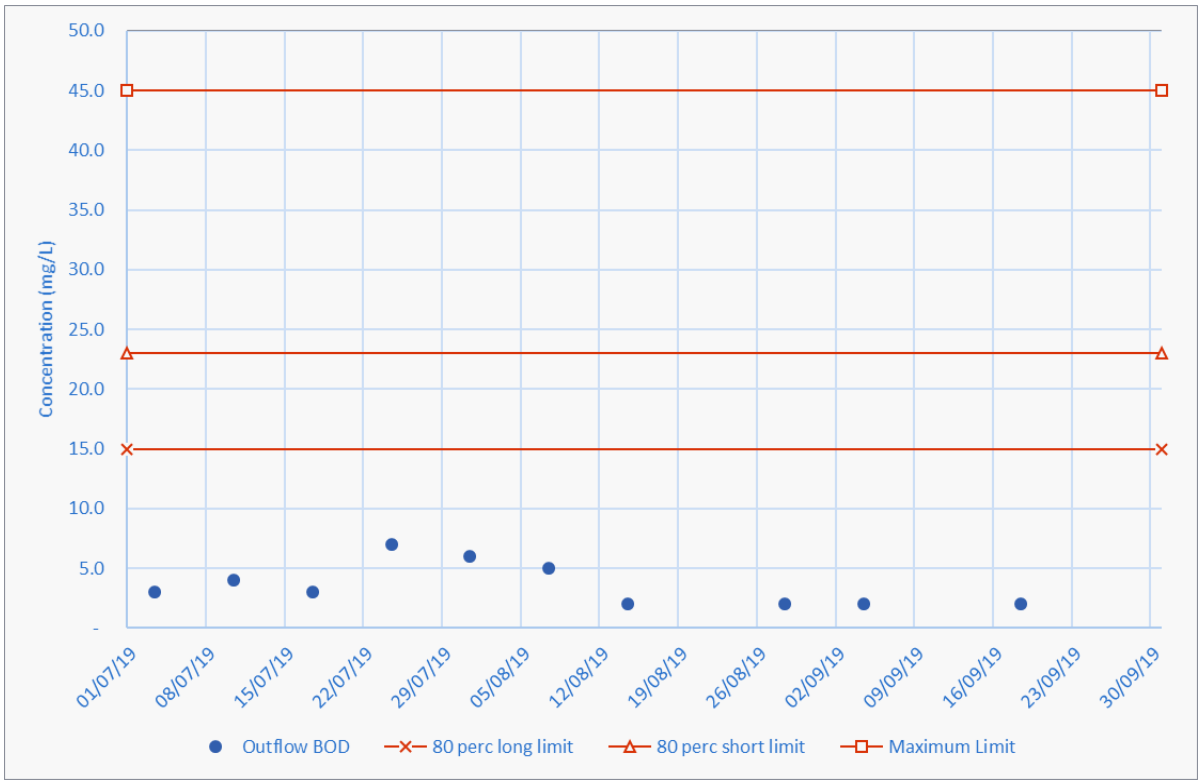

Fig 22. Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)