

5.2. WATER AND WASTEWATER QUARTERLY REPORT FOR THE PERIOD ENDING SEPTEMBER 2018

REPORT AUTHOR(S): Peter White, Coordinator Water and Wastewater

GENERAL MANAGER: Michael Kriedemann, Acting General Manager Operations

DEPARTMENT: Water and Wastewater

RECOMMENDATION

That Council receives and notes the Quarterly Report of the Water and Wastewater branch for the period ending 30 September 2018.

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 1 July to 30 September 2018.

Whilst the results are generally positive the areas for improvement are noted and will be the focus of the branch over the next quarter. Notable capital improvements include the construction completion of the 20MI Port Douglas reservoir and the backwash water discharge package at Mossman Water Treatment Plant.

BACKGROUND

This report is the first Quarterly Report submitted by the Water and Wastewater Branch 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 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 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.

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 September 2018
[5.2.1]

1 July 2018 – 30 September 2018

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 Branch.

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

This report highlights certain aspects of the activities of the Water and Wastewater Branch that are generally 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).

The amended Drinking Water Quality Management Plan (DWQMP) is a new user friendly health based risk management plan that demonstrates how public health risks are managed. In addition, the plan also describes how Douglas meets the requirements of the environmental authority for the Mossman Water Treatment Plant under the Environmental Protection Act (1994) and Water Licences under the Water Act 2000.

Water

1. Water reticulation services

General maintenance was carried out on all schemes for this quarter including all intakes flushing programs and cleaning/flushing of dead end mains. Hydrant and valve maintenance also continued throughout the schemes. Due to the continued dry weather, flushing events are only carried out when necessary for example when there is a water mains break. All other flushing programs have been put on hold until further notice.

Regular reservoir and pump station checks and intake maintenance are carried out on all schemes. Table 1 below shows the number of maintenance activities undertaken across all schemes.

Table 1. Water Reticulation Services

Douglas Shire Reticulation (all schemes)	
Settlement Meter Reads	67
New Water Services Connections	18
Service Repairs	132
Water Mains Repairs	10
Water Quality Complaints	2
Flushing Events: Mossman/Port Douglas/ Cooya/ Newell	0
Flushing Events: Whyanbeel/Wonga	0
Flushing Events: Daintree/ De Meio	0

There were 2 water quality complaints during the reporting period. Table 2 below shows the nature of the complaint, how it was resolved and the response time.

Address	CRM No & Date	Nature of water complaint	How it was resolved	Response Time
92 Marine Pde, Newell Beach	61619 19/07/2018	Blue stains in bathtub	Reason for blue stains was from old copper pipes on property side. Flushed and sampled residual 0.96 mg/L. Customer was satisfied and no further action required.	20 mins
4/6-8 Pioneer Cl, Craiglie	62862 30/08/2018	Water tasted like petrol	Hydrocarbons tested from closest drinking water sampling point. Hydrocarbon testing results negative, but taste/smell of water continued on property side. Further investigations needed by Environmental Health unit.	35 mins

Capital works program has commenced on the Mossman – Whyanbeel water mains interconnection phase 3 and is expected to be within budget. This capital works program will interconnect the Mossman scheme to the Wonga scheme within a 225 mm water main and will add water security for both schemes. All other water reticulation capital works programs are currently in procurement stages.

2. Water schemes and potable water consumption

Water Restrictions

Level 2 water restrictions remained in force for the whole of the reporting period. Intake levels were dropping due to minimal rainfall and consumption was in steady increase, see Figure 1.

All Schemes

Raw water quality has been good throughout all schemes aside from a few minor rain events. In the latter part of the reporting period the weather has continued to be dry and the intake levels continue to decrease. Raw water quality has been good with average turbidity below 0.9 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. Craiglie reservoir was fully operational. Both Flagstaff and Rocky Point reservoirs performed well and chlorine levels have been stable in all schemes.

Capital Works projects in this quarter include the construction completion of the 20MI Port Douglas Reservoir and the Backwash water discharge package at the Mossman Water Treatment plant. All other capital works for water treatment are in procurement stages.

Cert IV water industry training continued for two water and wastewater plant operators and additionally gas chlorine handling safety and breathing apparatus training was completed.

Mossman/Port Douglas Scheme

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

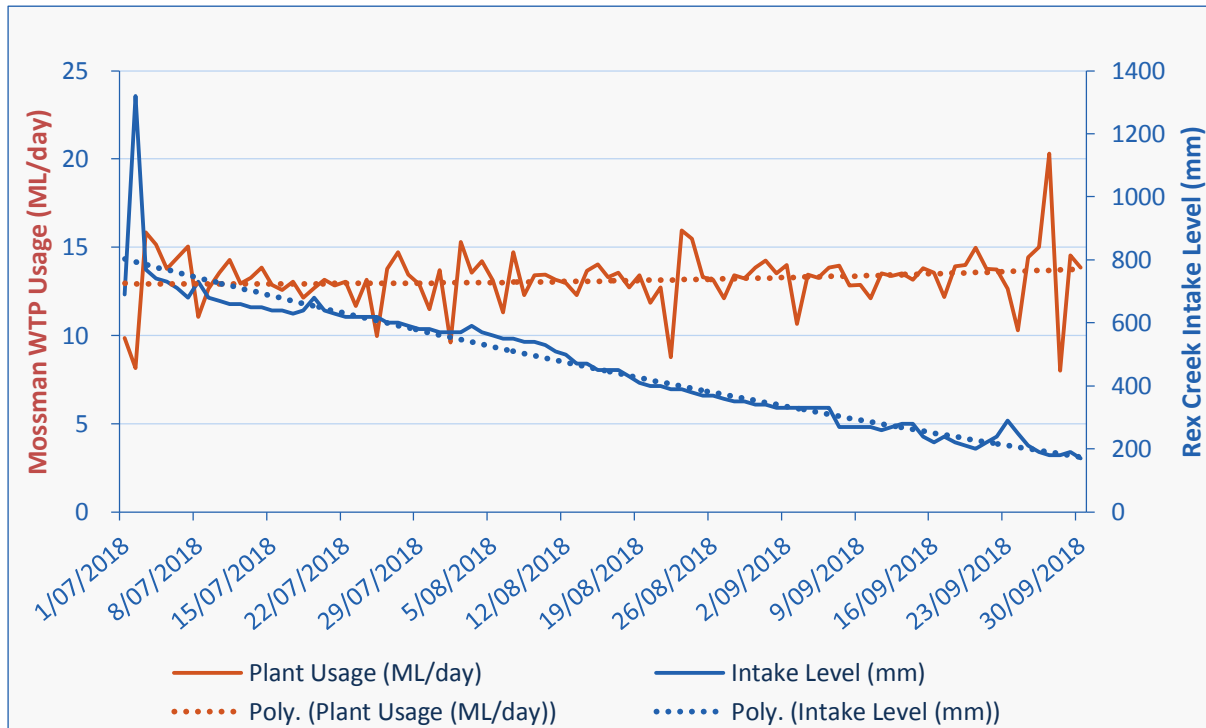
Consumer demand has slowly increased in line with seasonal trends.

Rex Creek intake levels have slowly decreased typical of the dry season and were at a low of 0.17m in the latter part of the reporting period resulting in breaches to the 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. General maintenance works were also undertaken.

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

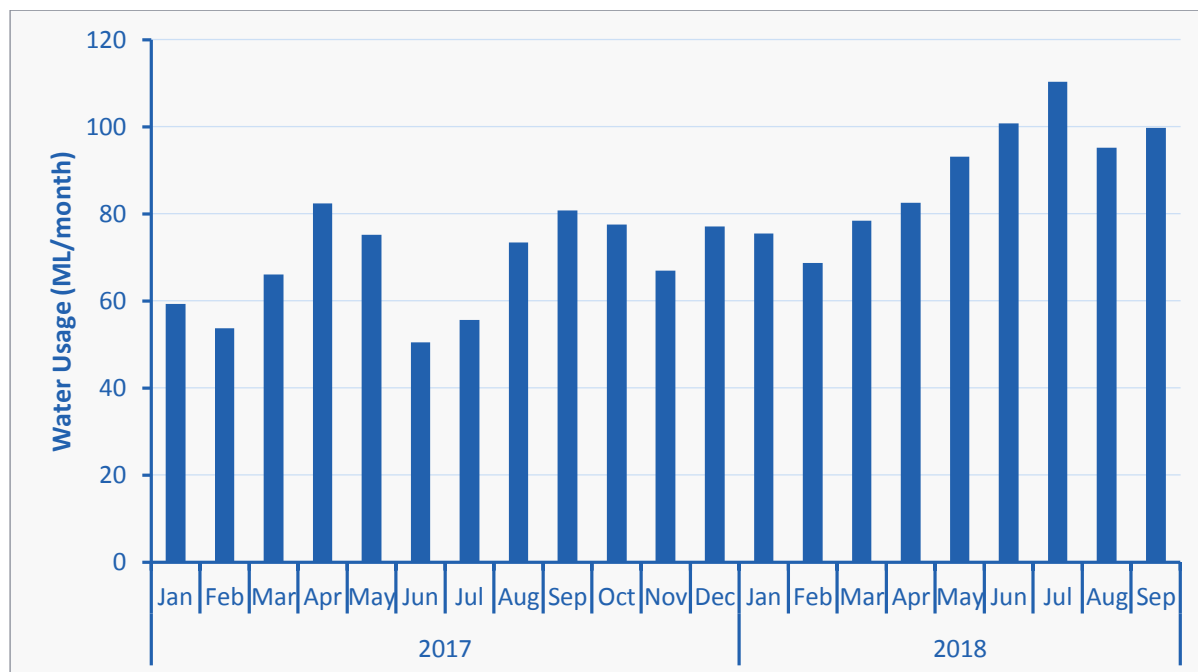
Fig 1. Mossman WTP usage and Rex Creek intake levels for the period 1 July 2018 – 30 September 2019



Mossman Water Supply

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

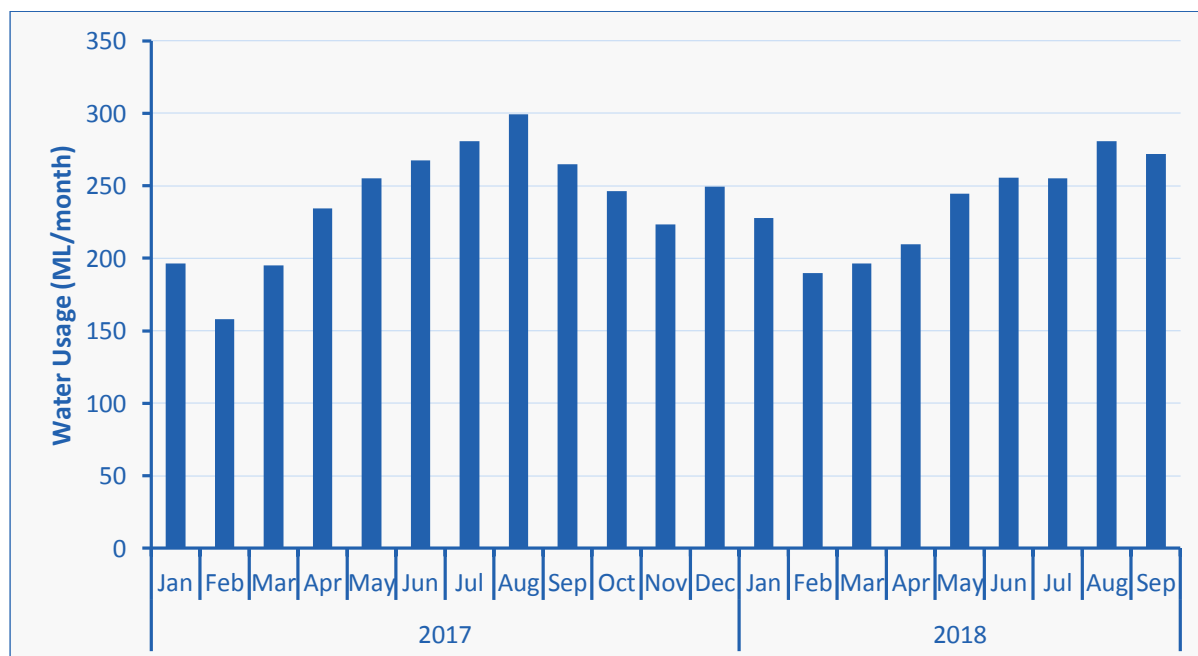
Fig 2. Mossman Scheme Monthly Consumption Figures



Port Douglas Water Supply

The total monthly consumption of water in Port Douglas can be seen in Figure 3.

Fig 3. Port Douglas Scheme Monthly Consumption Figures



Whyanbeel Scheme

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

The intake level has steadily dropped in line with seasonal trends. The level has been at a low of 0.15m which has resulted in a breach of the maximum extraction rate. Reservoir levels remained near capacity to ensure consumer demand was met.

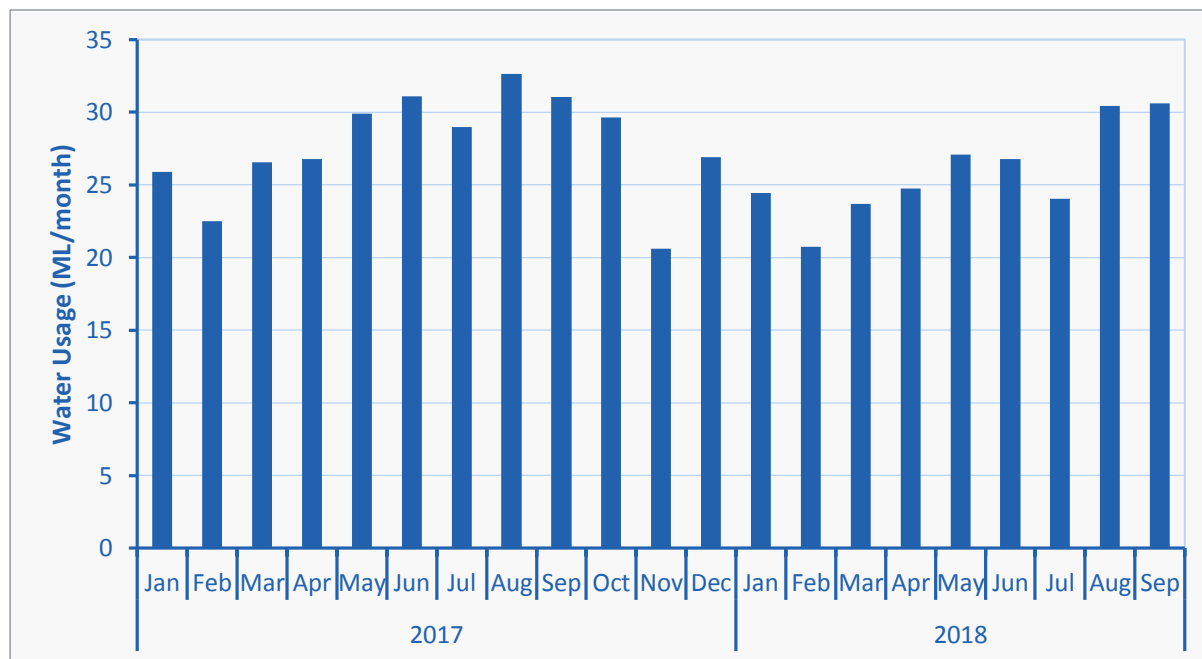
The UF rack was fully operational during the reporting period. To maintain UF filter efficiency chemical clean-in-place operations were undertaken and general maintenance work continued.

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

Whyanbeel Water Supply

The total monthly consumption of water in the Whyanbeel scheme can be seen in Figure 4.

Fig 4. Whyanbeel Scheme Monthly Consumption Figures



Daintree Scheme

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

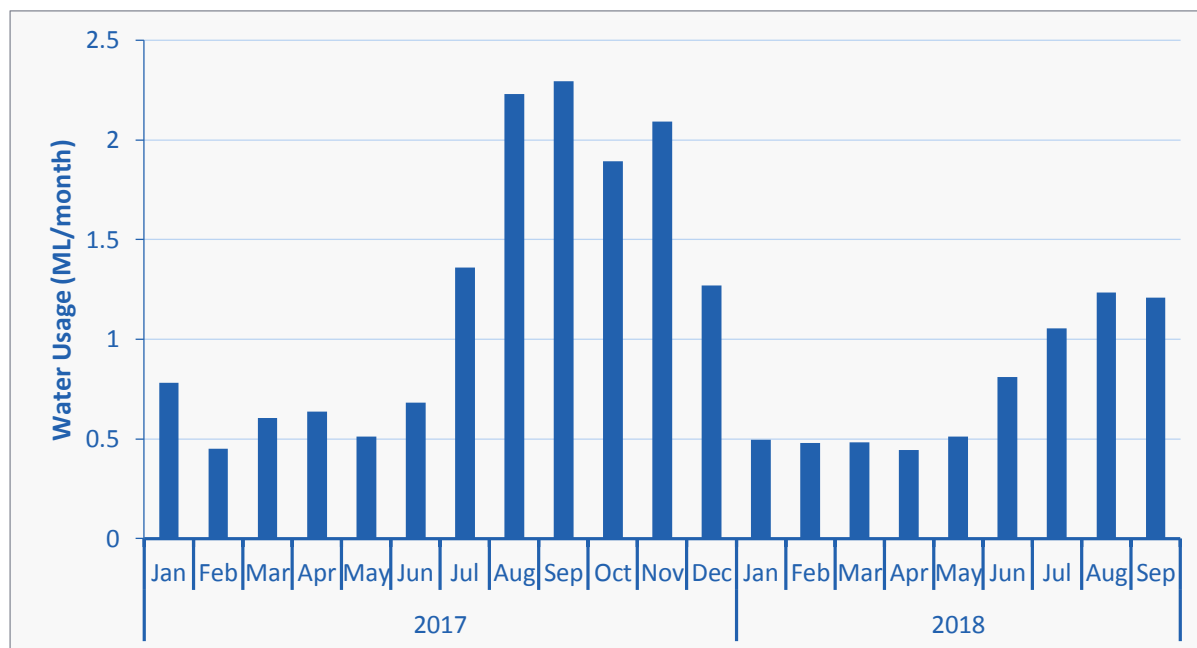
Intake levels at Intake Creek have steadily decreased, but were adequate to meet consumer demand.

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

The total monthly consumption of water in the Daintree scheme can be seen in Fig 5.

Fig 5. Daintree Scheme 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 Australian Drinking Water Guideline (ADWG).

Within the amended DWQMP the drinking water verification monitoring was comprehensively reviewed and a new sampling program was started in the beginning of July 2018. The focus of the new verification program is to ensure that the individual reticulation zones are monitored regularly with monthly sampling at the reservoirs. The number of sampling sites has been reduced to one per reticulation zone rather than previous 2-3. 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 68 treated water E.coli compliance samples were taken in the three drinking water schemes. A total of 21 E.coli samples were tested in the Douglas water laboratory and 47 in 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 9 raw water E.coli samples were taken at the intakes. 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 can be seen 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 2018.

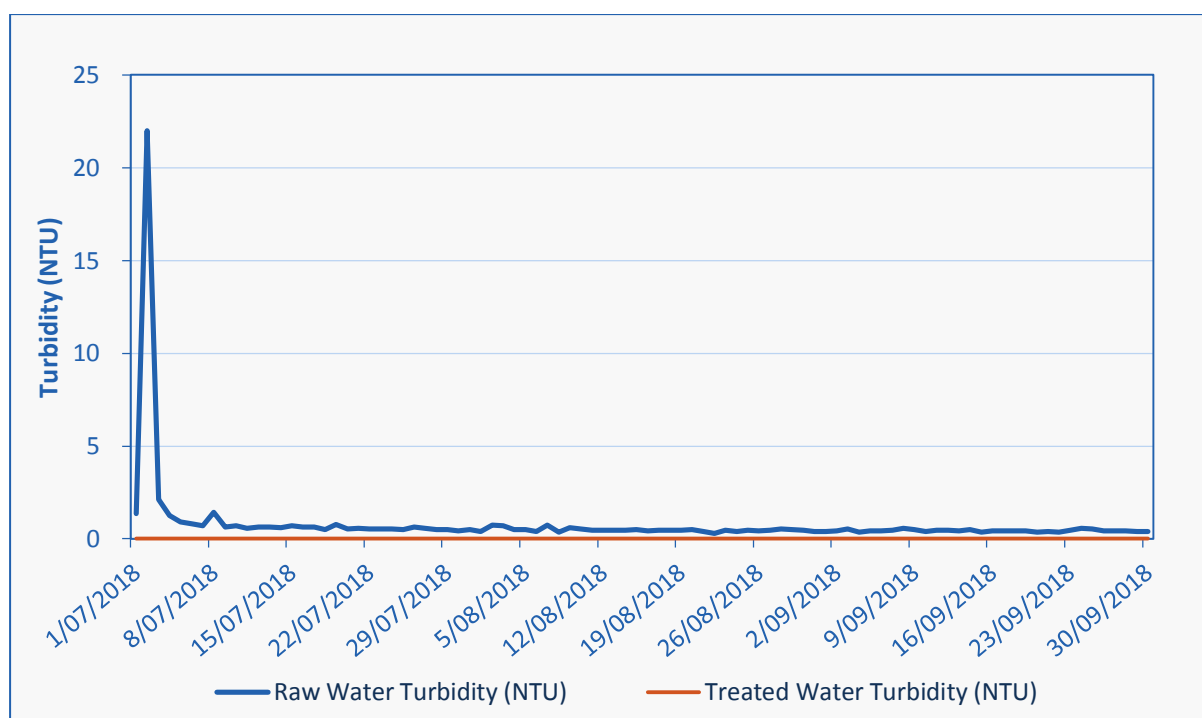
Table 3. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.

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
Jul-18	6.7	22	<5	1.1	1.1	<1
Aug-18	6.7	21	<5	1.1	1.1	<1
Sep-18	6.8	21	<5	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	<5	<15	<1	<0.3	<0.1	<1
Jul-18	6.7	24	0.9	1.0	<5	0.010	0.009	<0.005	<1
Aug-18	6.8	23	1.1	1.1	<5	0.009	0.008	<0.005	<1
Sep-18	6.8	25	0.9	1.0	<5	0.013	0.016	<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 can be seen 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 2018.

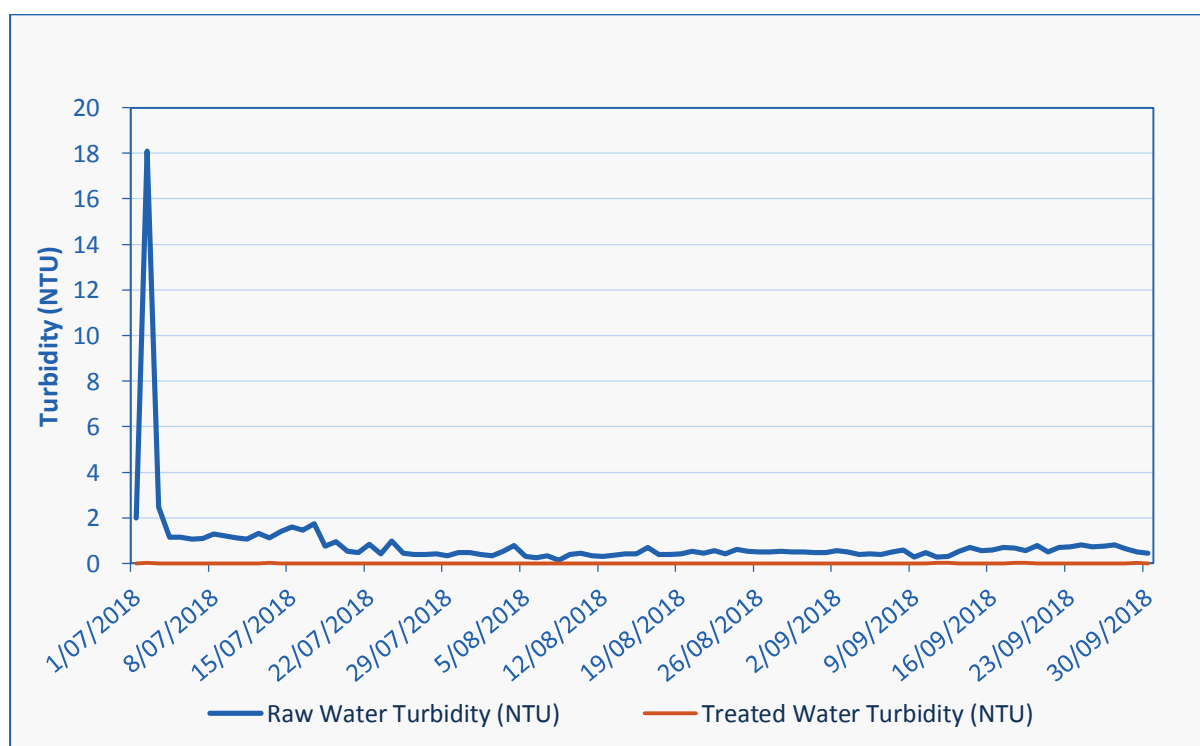
Table 5. Average monthly values for key operational and compliance parameters in the Whyanbeel Reservoir.

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
Jul-18	7.5	23	8	1.1	1.1	<1
Aug-18	7.8	24	9	1.8	1.9	<1
Sep-18	7.5	24	9	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
Jul-18	7.5	24	0.9	1.0	<5	0.004	0.016	<0.005	<1
Aug-18	7.5	24	1.2	1.3	<5	0.001	0.012	<0.005	<1
Sep-18	7.5	26	1.0	1.1	<5	0.004	0.012	<0.005	<1

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



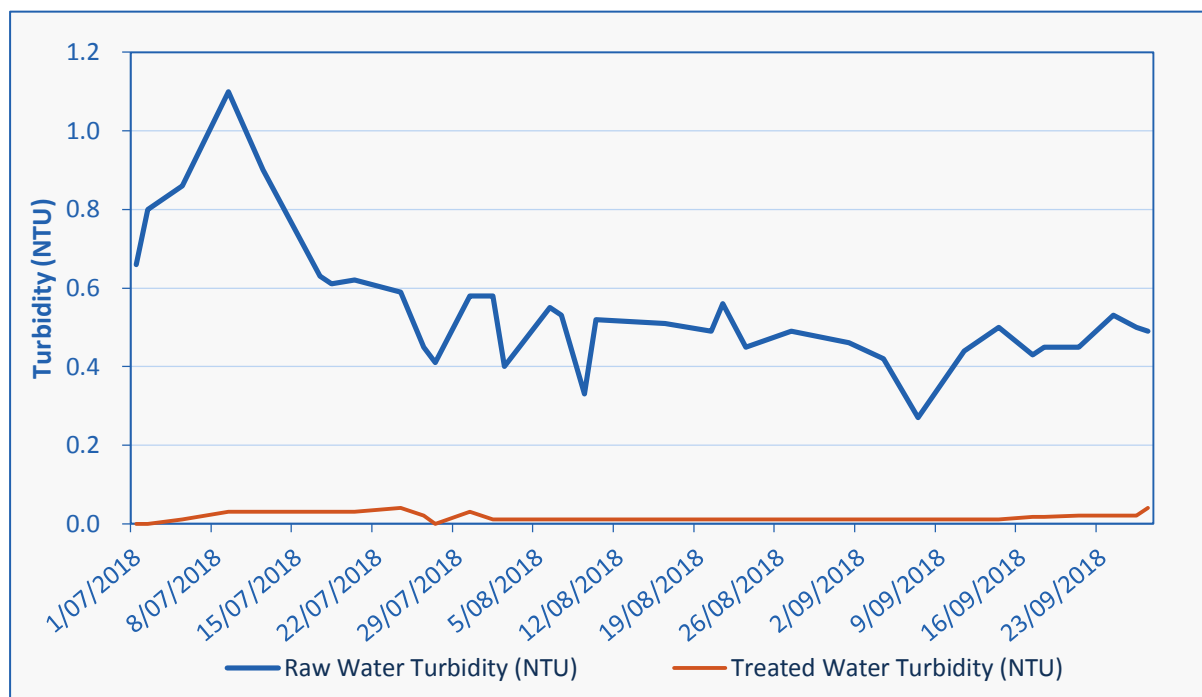
Daintree Supply Scheme

Average monthly values for key operational and compliance parameters can be seen 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 July to September 2018.

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
Jul-18	7.8	24	0.9	1.0	<5	0.003	0.008	<0.005	<1
Aug-18	7.9	24	0.9	0.9	<5	0.003	0.007	<0.005	<1
Sep-18	8	25	0.9	0.9	<5	0.006	0.009	<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 were carried out at the reticulation networks and 31 pump stations in the Mossman and Port Douglas catchments. 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	20	6
Sewer Chokes	1	1
Sewer Main Breaks	1	0
HCB Repairs (House Connection Branch)	4	2
Odour Complaints	0	0

Capital works for Wastewater projects have commenced in this quarter and are expecting to be on budget and delivered within the time period. One of the major capital works project is the Mossman Waste Water Treatment Plant second clarifier which is half way to completion.

The new clarifier will have major benefits to the Mossman Waste Water Treatment Plant and improve the efficiencies and performance of the plant.

The sewer relining schedule has recommenced for the Port Douglas and Mossman sewer network areas and the Port Douglas Waste Water Treatment Plant Ultra Violet lamp replacements are near to completion. The existing lamps are reaching their end of life span and they are required to effectively remove pathogens in water to meet licence requirements.

Influent and irrigation flows

Port Douglas Wastewater Treatment Plant

A total of 289,654 kL of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average daily flow was 3,148 kL/day. Tanker truck contractors delivered 745.99 kL of septage to the plant and 3,391 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 resorts and the remaining discharged into the Dickson Inlet. The Sheraton Mirage received 89,164 kL and Palmer Sea Reef received 35,381 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 72.5 mm. On 2 July 2018, the highest rainfall on a day was recorded as 39 mm.

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

Fig 9. Port Douglas Daily Inflow

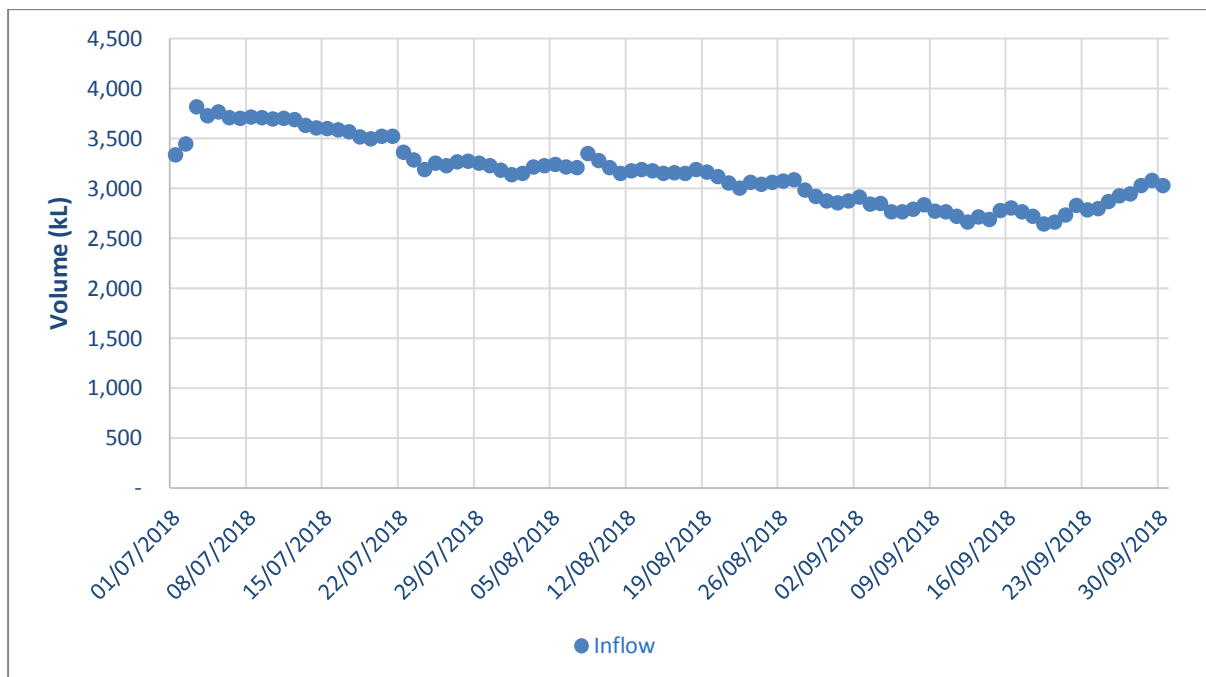
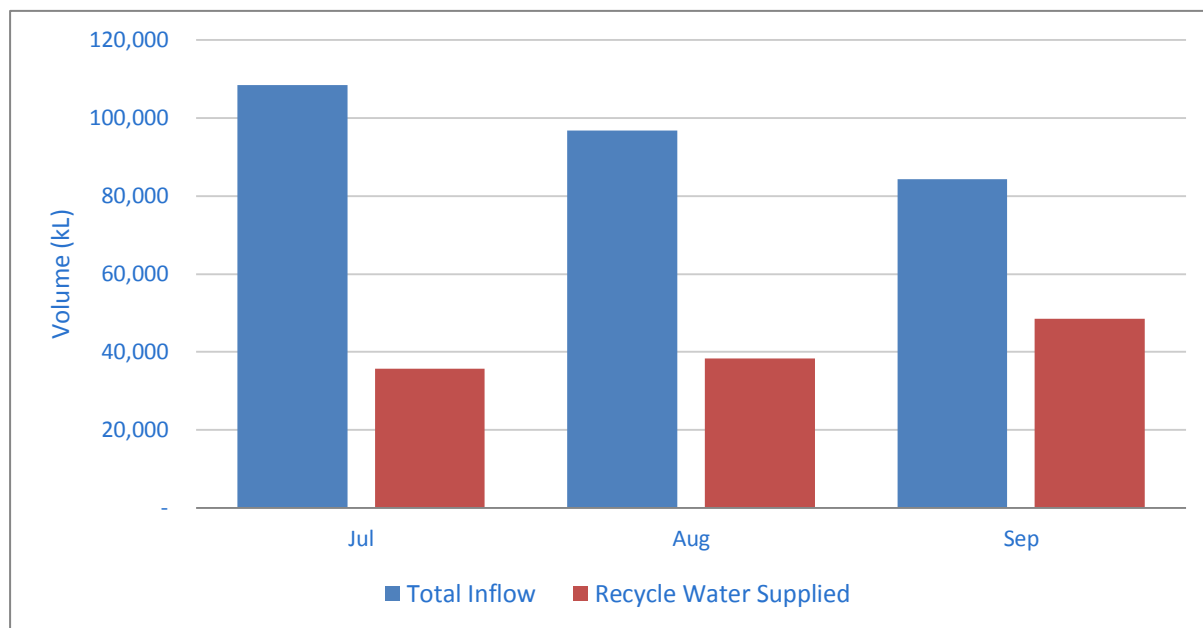


Fig 10. Port Douglas Total Monthly Flow 2018



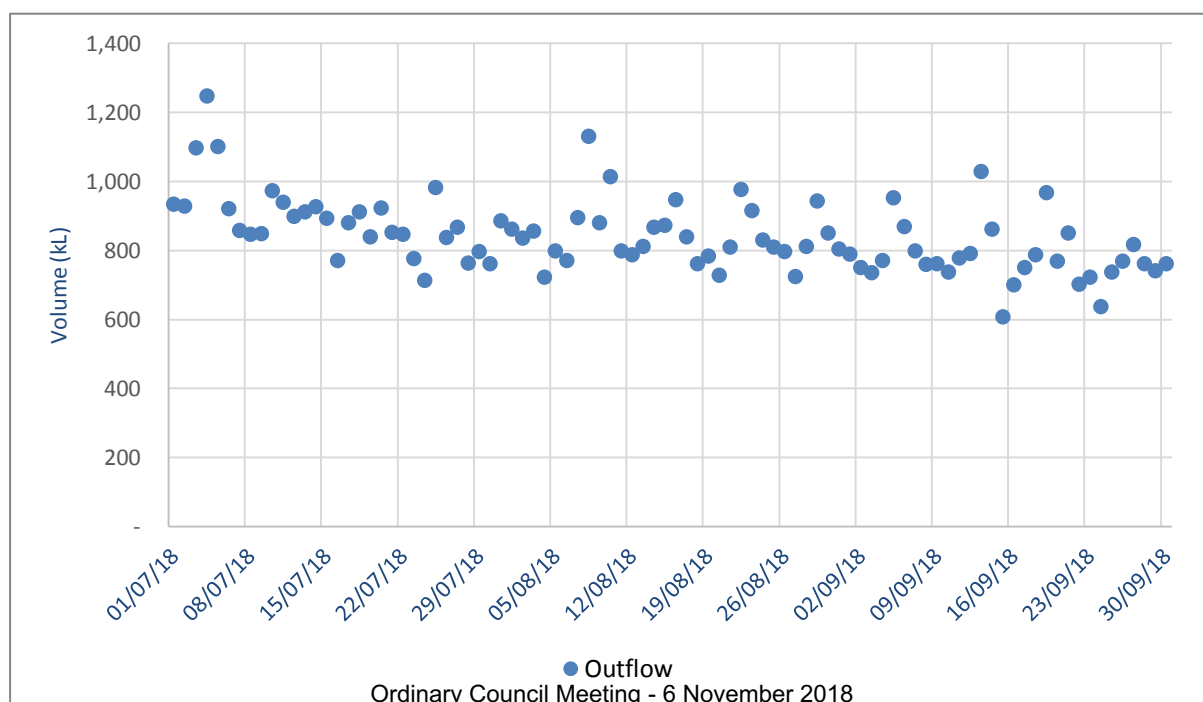
Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 76,490 kL during the reporting period. The average daily flow was 831 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River. A total of 78 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 44 mm on 2 July 2018.

Douglas Shire Council Environmental Authority Permit EPPR01790513 states an inflow limit: Inflows must not exceed the peak design capacity of three times the Design Average Dry Weather Flow (DADWF) of 1.15 ML/day – equating to 3.45 ML/day – on any day unless the standard treatment processes of the plant are bypassed.

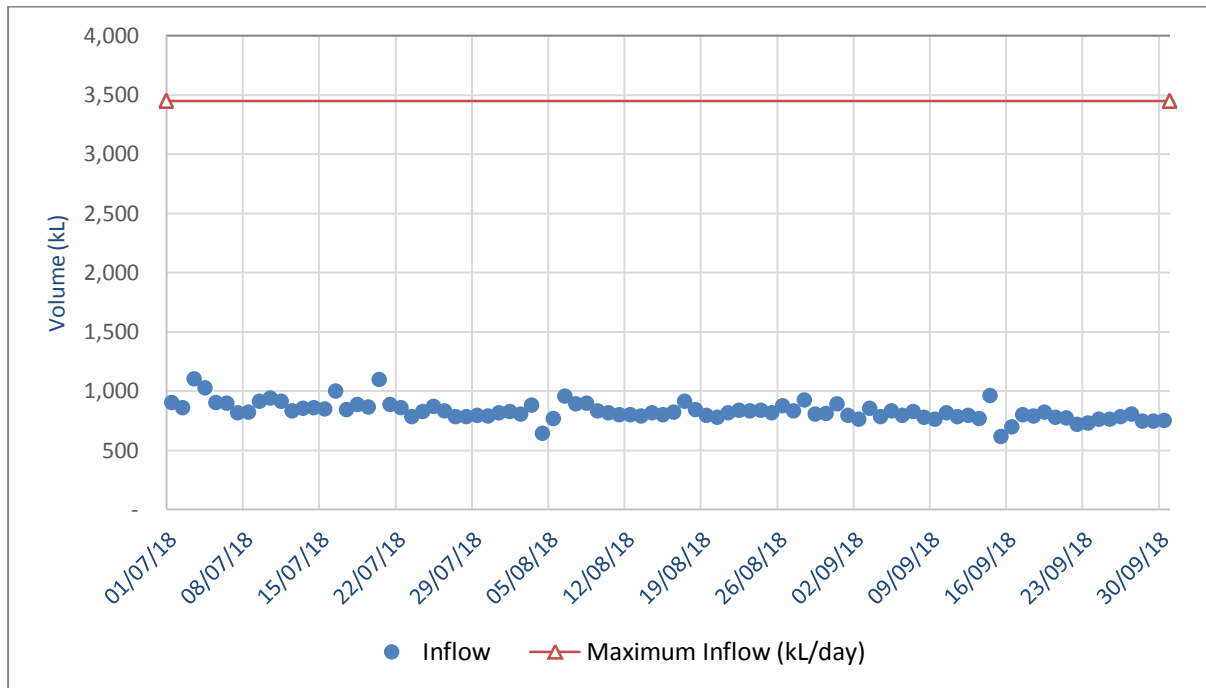
Outflow and Inflow data for the reporting period are shown in Fig 11 and 12 respectively.

Fig 11. Mossman Wastewater Treatment Plant Daily Outflow



Ordinary Council Meeting - 6 November 2018

Fig 12. Mossman Wastewater Treatment Plant Total Daily Inflow 2018



5. Bio-solids Production

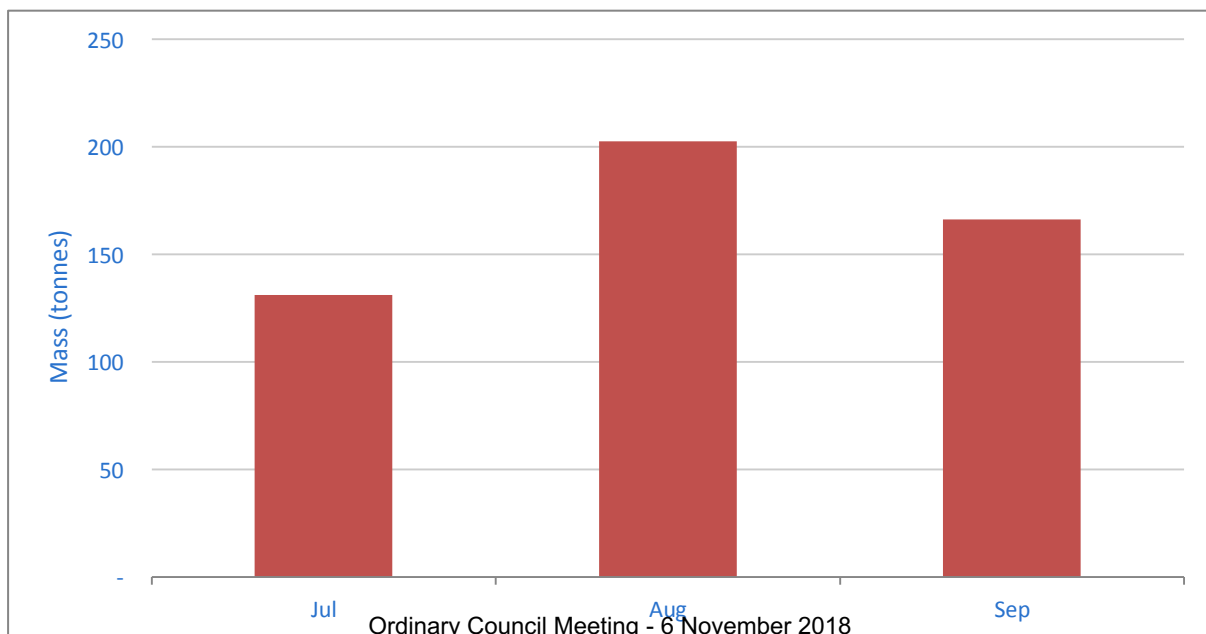
Bio-solids were produced at the dewatering plants at Mossman Wastewater Treatment Plant (11.4% solids) and Port Douglas Wastewater Treatment Plant (10.76% solids). Bio-solids were transported by Arkwood Organics to Edmonton Farms, Tablelands Regional Farms and Spring Mount Waste Facility for further treatment and beneficial land application as organic fertiliser and soil conditioner.

Port Douglas Wastewater Treatment Plant

At Port Douglas Wastewater Treatment Plant, 569.65 tonnes of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet Biosolids equates to 61.3 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 2018



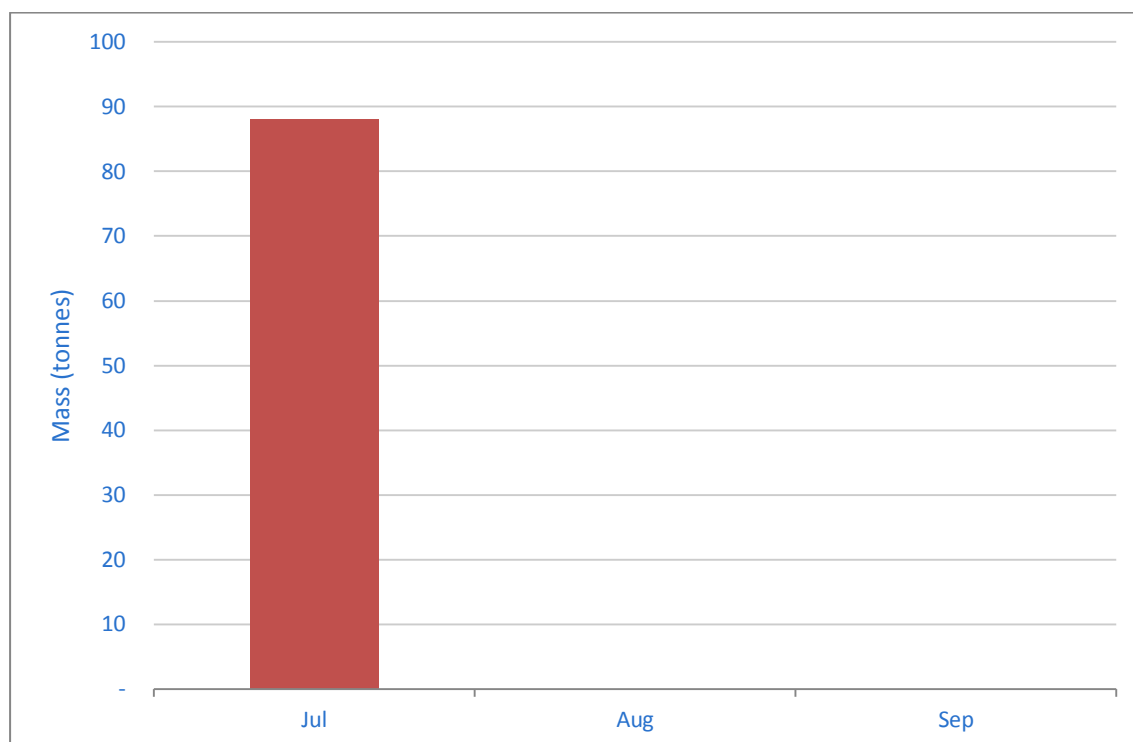
Ordinary Council Meeting - 6 November 2018

Mossman Wastewater Treatment Plant

At Mossman Wastewater Treatment Plant, 69.14 tonnes of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet Biosolids equates to 7.88 dry tonnes.

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

Fig 14. Mossman Wastewater Treatment Plant monthly bio-solids production 2018



***No Bio-solids removed in August and September 2018.**

Effluent quality and compliance

During the reporting period compliance sampling was conducted 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 in the Port Douglas and Mossman catchments were compliant except for two high readings at the Mossman Wastewater Treatment Plant. On 11 July 2018 a high reading was caused by potential illegal dumping of a substance into the sewer gravity system that affected the Ammonia NH₃-N nutrient level higher than the 1 mg/L maximum limit. Response from DEHP was no further action taken. The second reading on 22 August 2018 at the Mossman Wastewater Treatment Plant recorded a higher limit of Ammonia NH₃-N than 1mg/L license limit, was reported to DEHP and no further action taken. There are operational limitations at the Mossman Wastewater Treatment Plant due to the construction of the new clarifier which limits the plants capacity.

The process and compliance is monitored each day by in-house analyses of samples at the 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

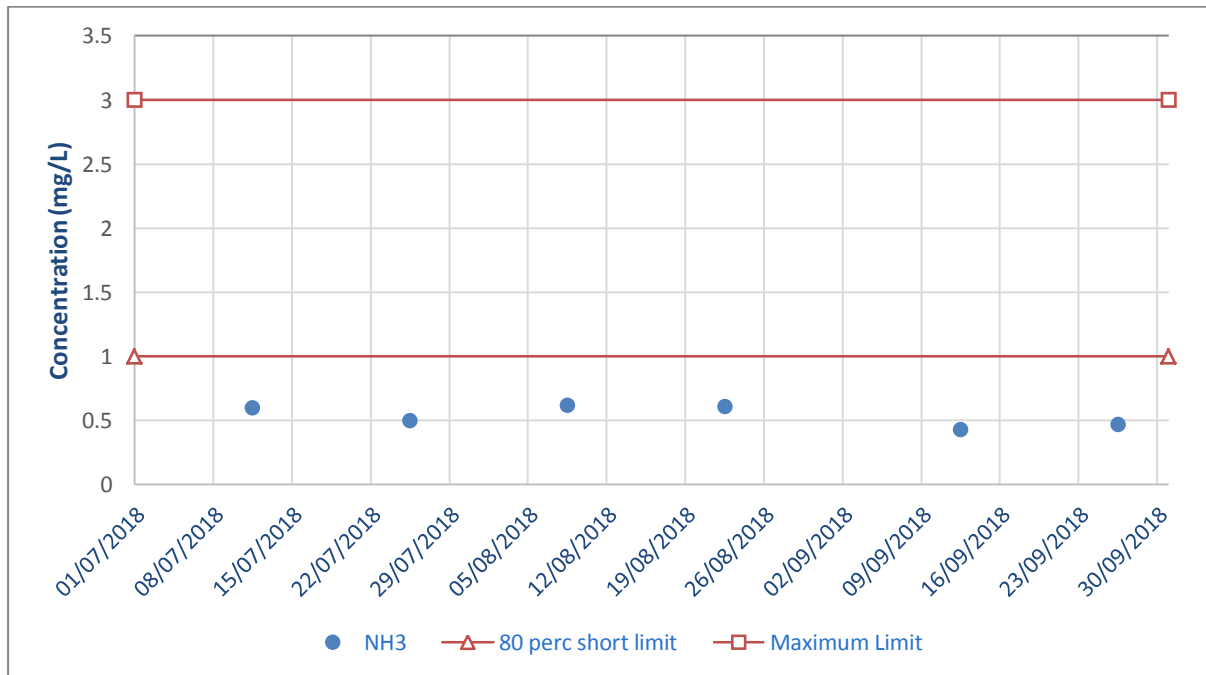


Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous

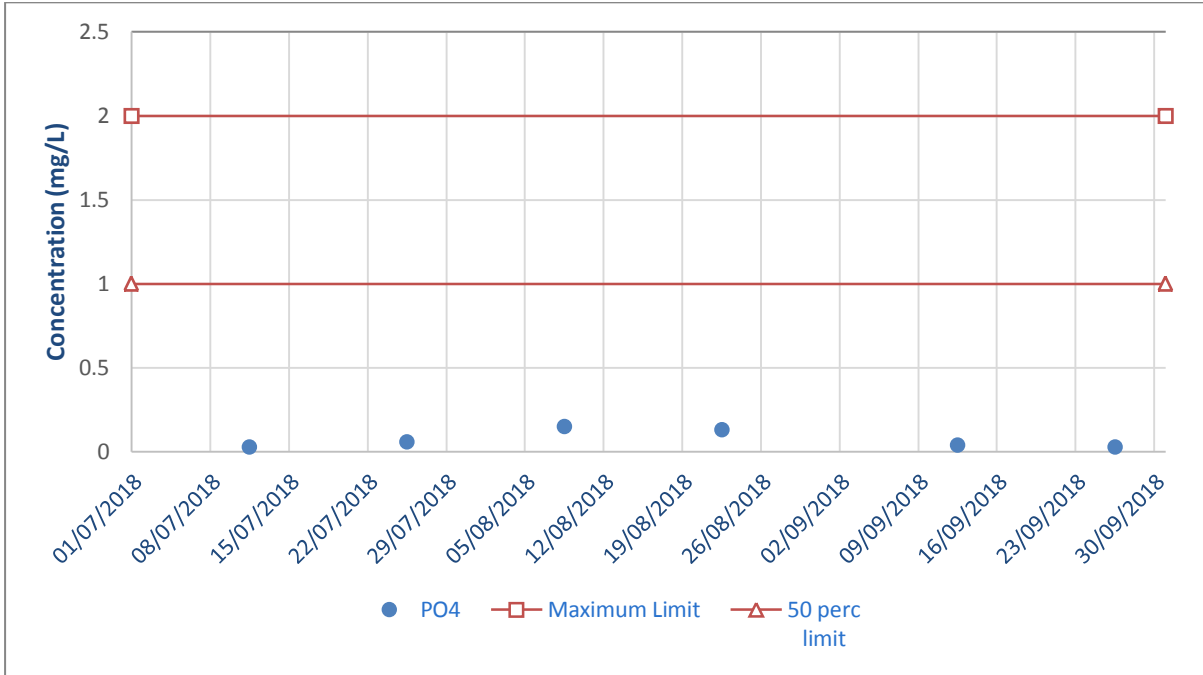


Fig 17. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids

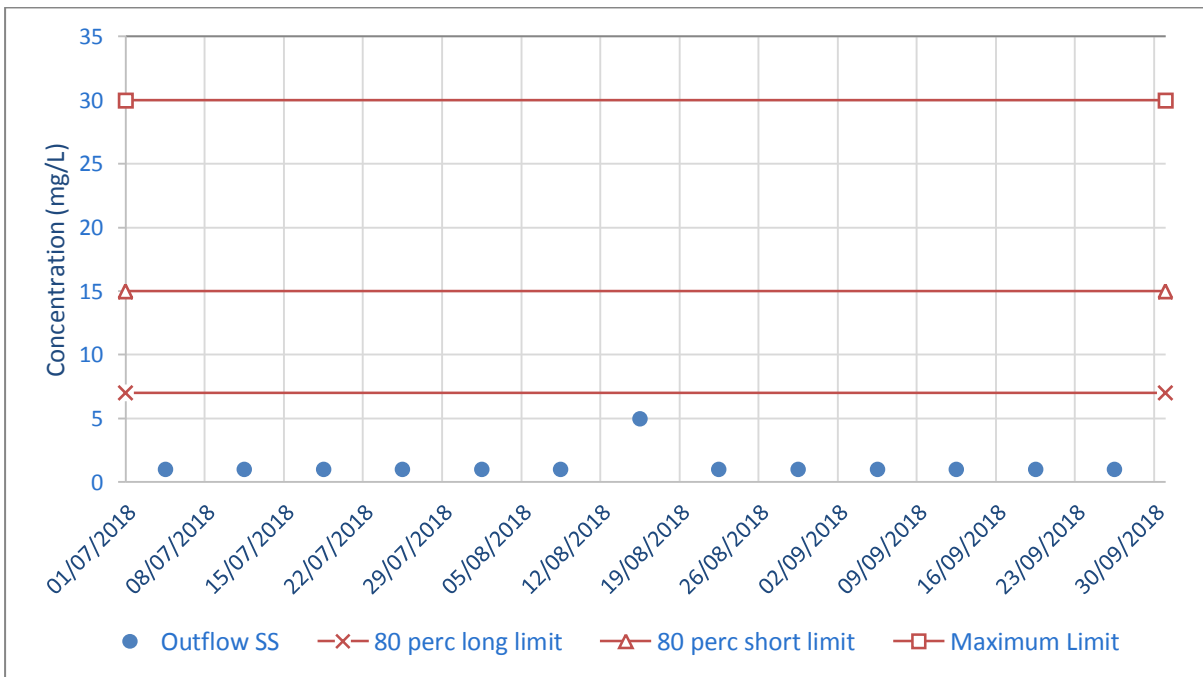
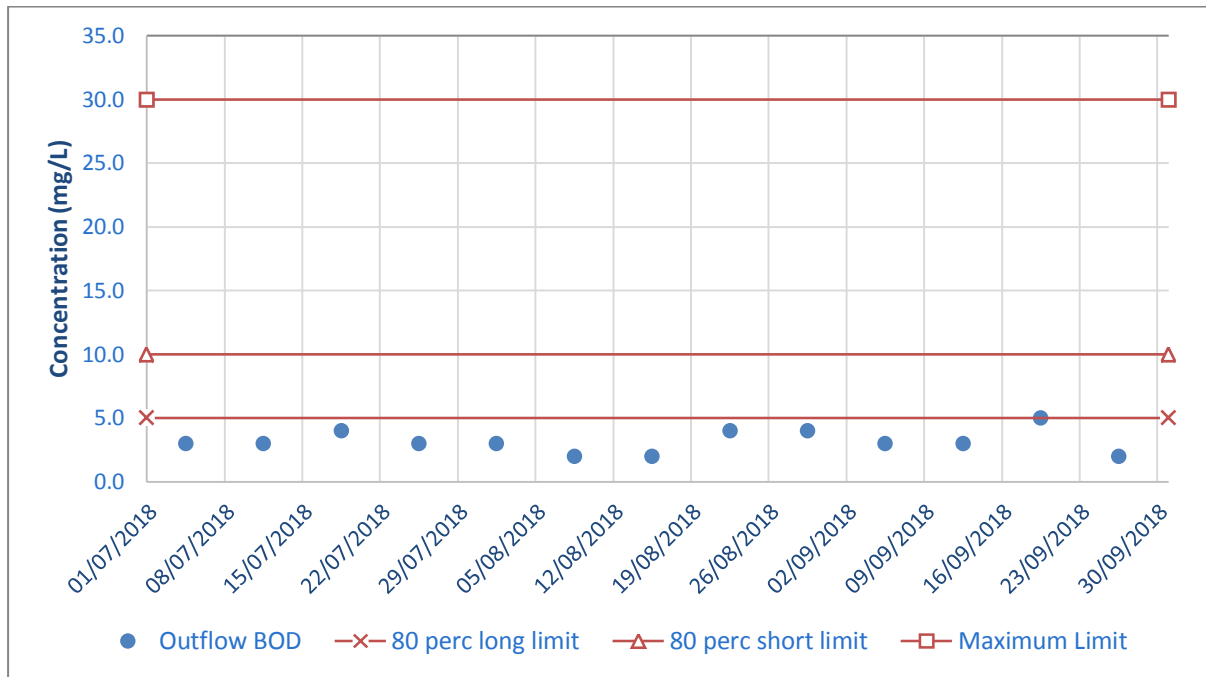


Fig. 18 Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD₅ (Biochemical Oxygen Demand)



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

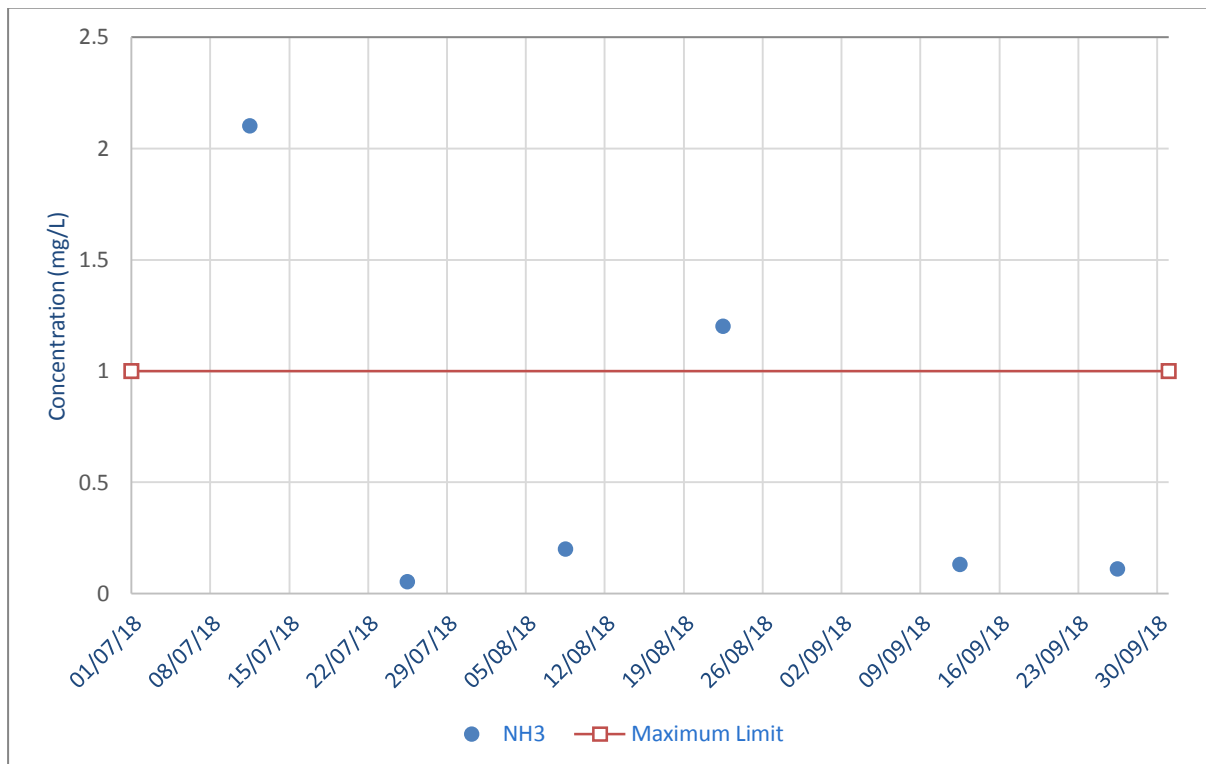


Fig. 20 Mossman WWTP Final Effluent Test Results for Total Phosphorous

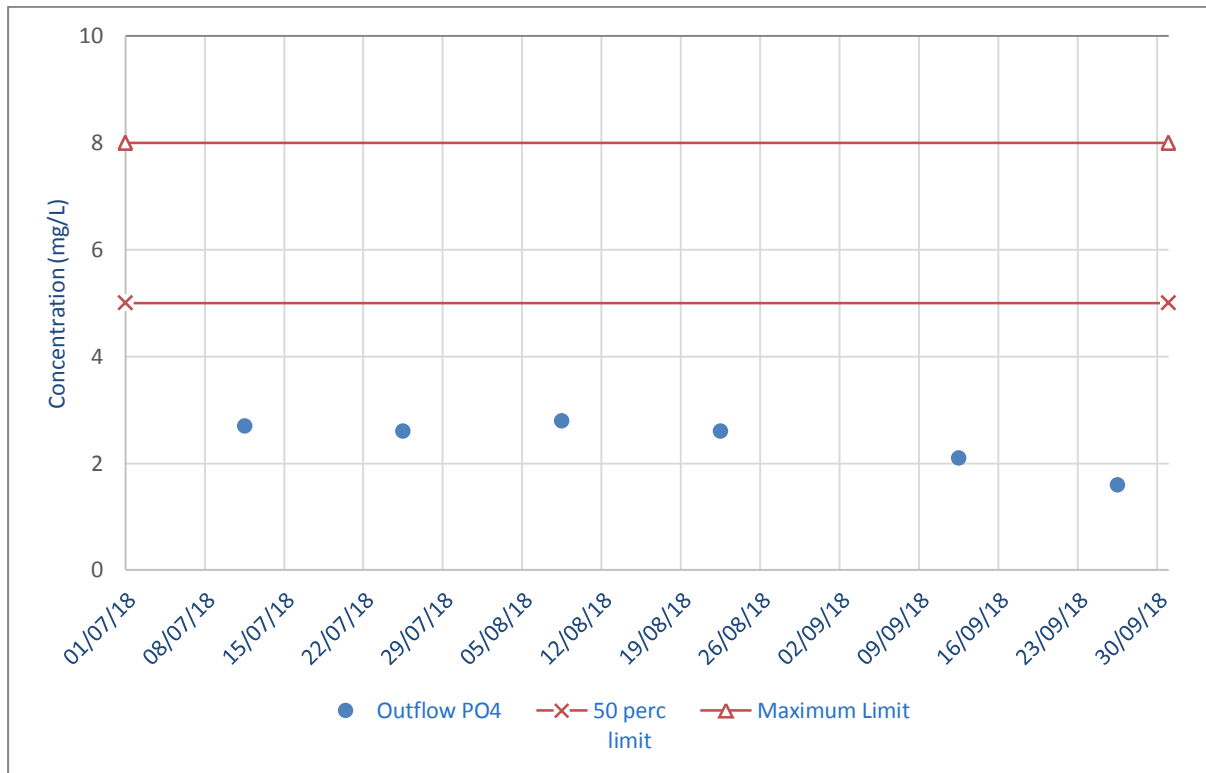


Fig. 21 Mossman WWTP Final Effluent Test Results for Total Suspended Solids

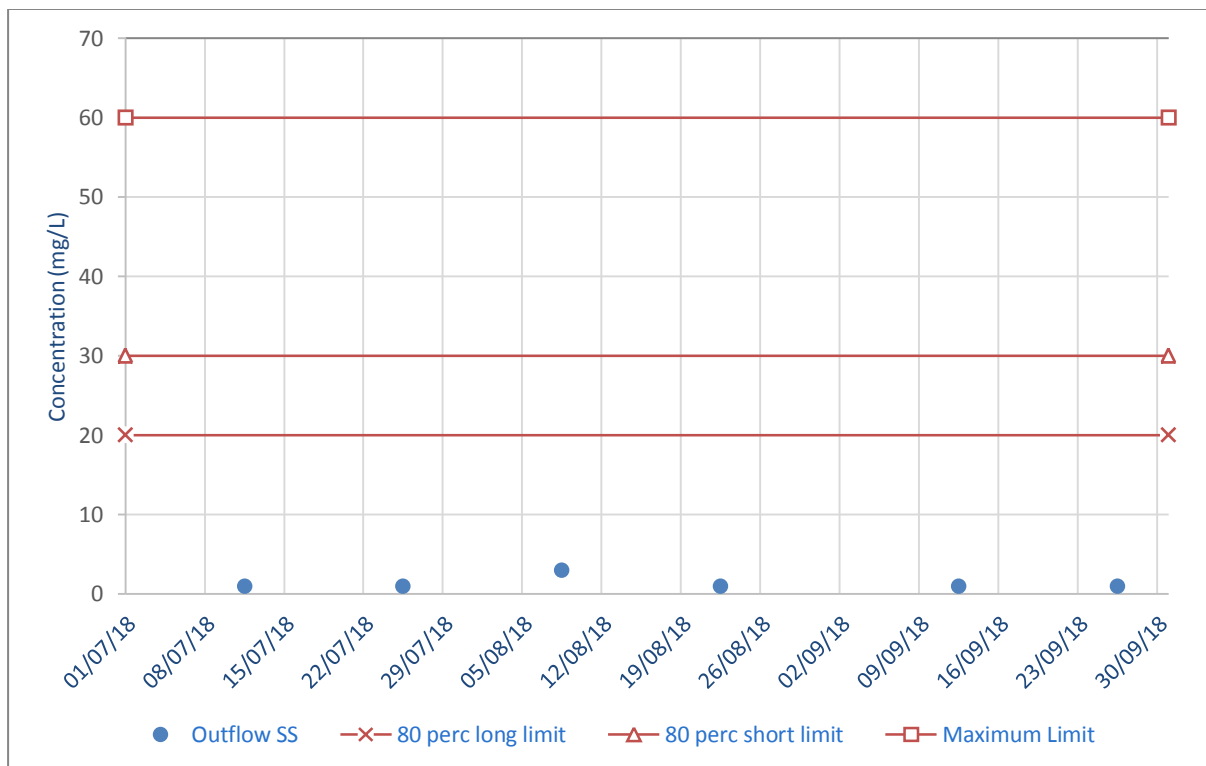


Fig. 22 Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD₅ (Biochemical Oxygen Demand)

