5.3. WATER AND WASTEWATER QUARTERLY REPORT FOR THE PERIOD ENDING 31 MARCH 2018

GENERAL MANAGER Michael Kriedemann, Acting General Manager Operations

DEPARTMENT Water and Wastewater

RECOMMENDATION

It is recommended that the Quarterly Report of the Water and Wastewater branch for the period ending 31 March 2018 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 1 January to 31 March 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.

BACKGROUND

This report is the third Quarterly Report submitted by the Water and Wastewater Branch during the 2017/2018 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 2017-2018 Actions:

3.1.10 - Obtain revised licence for Mossman Wastewater Treatment Plant

3.2.2 - Complete a review of the Drinking Water Quality Management Plan

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 31 March 2018 **[5.3.1]**

Water and Wastewater Quarterly Report

1 January 2018 – 31 March 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 Environmental Authority EPPR01790153 was approved on 9 March 2018 by DES for licence condition changes relating to Mossman WTP, Mossman WWTP and Port Douglas WWTP.

The Drinking Water Quality Management Plan amendment was submitted to DNRME for review on 5 February 2018 and is currently being assessed.

Water

1. Water reticulation services

General maintenance was carried out on all schemes for this quarter including all intake flushing programs and cleaning/flushing of dead end mains. Hydrant and valve maintenance also continued throughout the schemes. Ongoing hydrant and valve maintenance is continuing on all schemes and regular flushing events are in place across the shire to maintain acceptable chlorine residuals within the schemes.

Certificate III Water Management training is completed for four members of the Water Team.

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	69
New Water Services Connections	12
Service Repairs	164
Water Mains Repairs	12
Water Quality Complaints	3
Flushing Events: Mossman/Port Douglas/ Cooya/ Newell	7
Flushing Events: Whyanbeel/Wonga	5
Flushing Events: Daintree/ De Meio	3

There were 3 water quality complaints during the reporting period. Table 2 below shows the nature of the complaint, the actions taken and the response time.

Table 2. Water Complaints

Address	CRM No & Date	Nature of water complaint	How it was resolved	Response Time
16 Yiki Close Port Douglas	57775 15/03/2018	Cloudy and bubbly (caused by air after water main cut in)	Flushed the line to remove air. Residual chlorine tested and was at 1.01, being well within the acceptable range. Customer satisfied with outcome.	20 mins
16 Yiki Close Port Douglas	57800 16/03/2018	Cloudy water (air in water)	Flushed the area and at water meter until it was clean water. Residuals chlorine tested and levels well within acceptable range. Customer satisfied with outcome.	25 mins
461R Bonnie Doon Rd Cooya	57818 16/03/2018	Smelly water at dead end main	Flushed the entire area until clear and cold. Customer satisfied with outcome.	35 mins

2. Water schemes and potable water consumption

Water Restrictions

Levels 3 and 4 water restrictions were adopted on 24 October 2017 at a Special Council Meeting to enable Council to act if the need to further reduce water consumption was required, particularly with weather patterns showing prolonged dry periods.

Level 2 water restrictions remained in force for the whole of the reporting period.

All Schemes

Raw water quality has varied on account of heavy rainfall but on average (outside of storm events) raw water quality was around 1.0 NTU. Severe storms and heavy rain fall has impacted on the intakes resulting in a number of plant shutdowns. The plant shutdowns occurred where extra maintenance was required to remove large volumes of sand and debris; all intakes are functioning well after the wet weather events. The record rainfall in March resulted in considerable plant outages and extremely low reservoir levels. A coordinated response from Council enabled a continuous supply of safe drinking water to consumers with no water quality incidents reported. The integrity of the entire reticulated treated water supplies was maintained to a very high standard throughout the storm events and reservoir levels were steadily replenished.

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 the calcium hypo automated dosing facilities maintained stable chlorine levels in the drinking water.

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

Mossman/Port Douglas Scheme

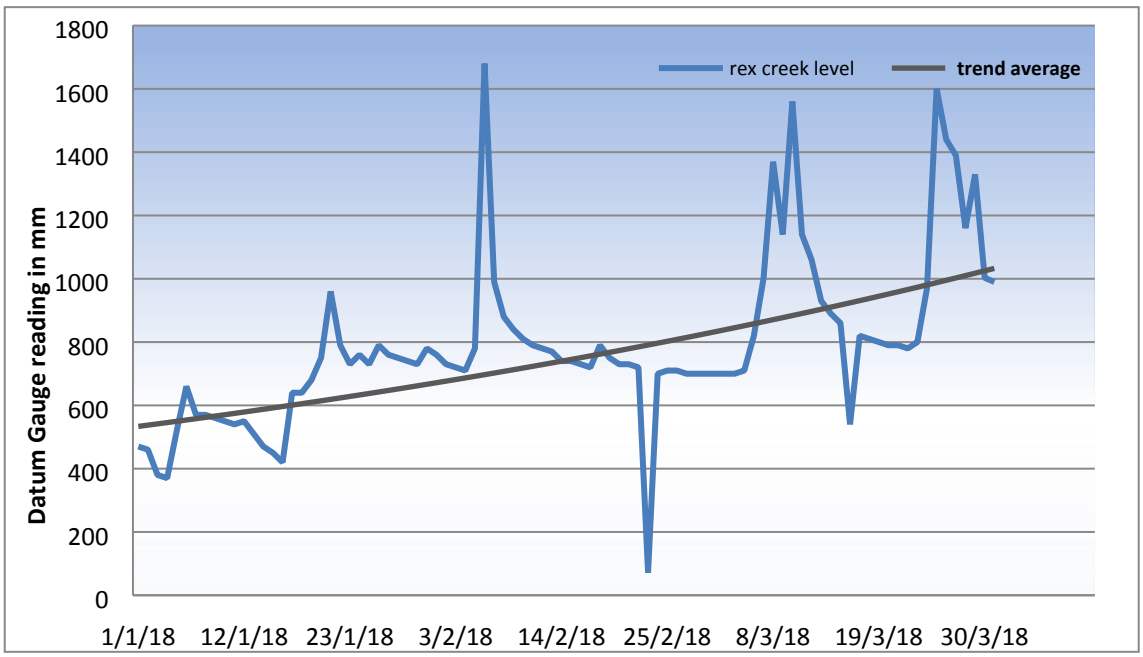
Mossman Water Treatment Plant met all demand requirements during the reporting period. Consumer demand declined somewhat with the on set of heavy rains and the lull in the tourist season but is expected to increase throughout the next quarter.

Rex Creek Intake levels have increased with frequent rain events reaching a maximum of 2.9 metres during storm events and averaging around 0.76 metres providing for 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. General maintenance works were also undertaken.

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

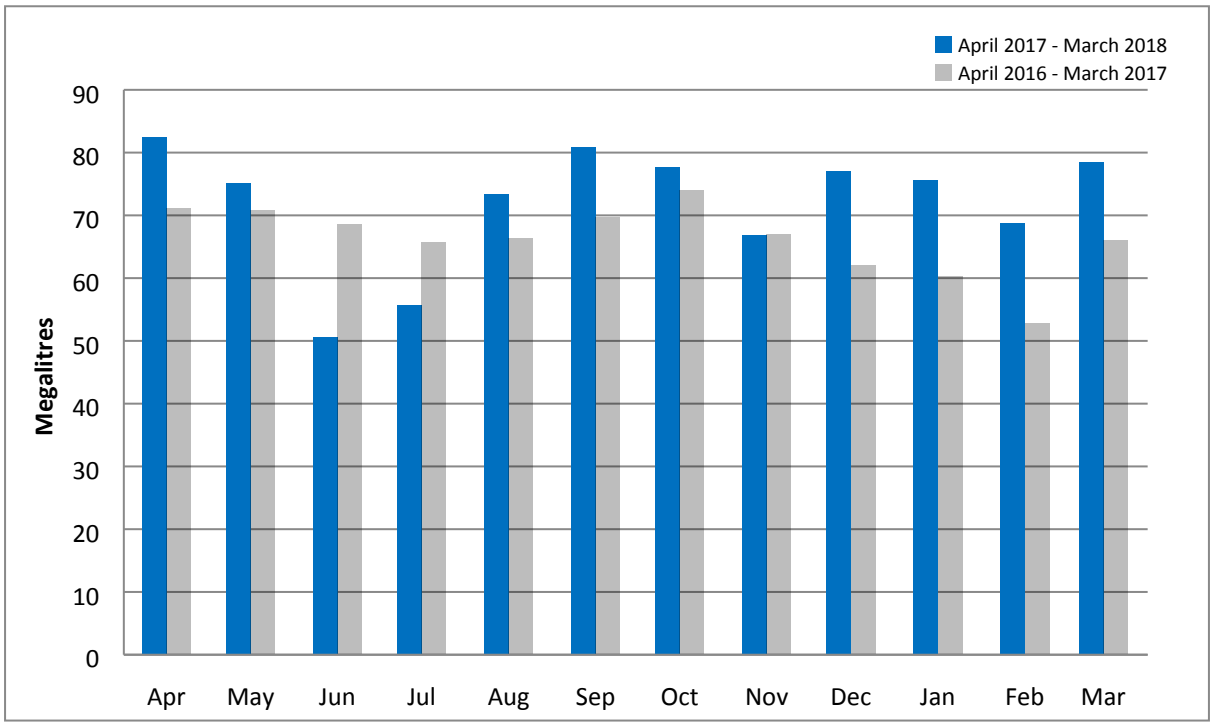
Fig 1. Rex Creek Intake level for the period 1 January 2018 – 31 March 2018



Mossman Water Supply

The total monthly consumption of water in Mossman, Cooya Beach and Newell Beach areas can be seen in Figure 2 with 2018 figures for January, February and March trending moderately higher than for the same period in 2017.

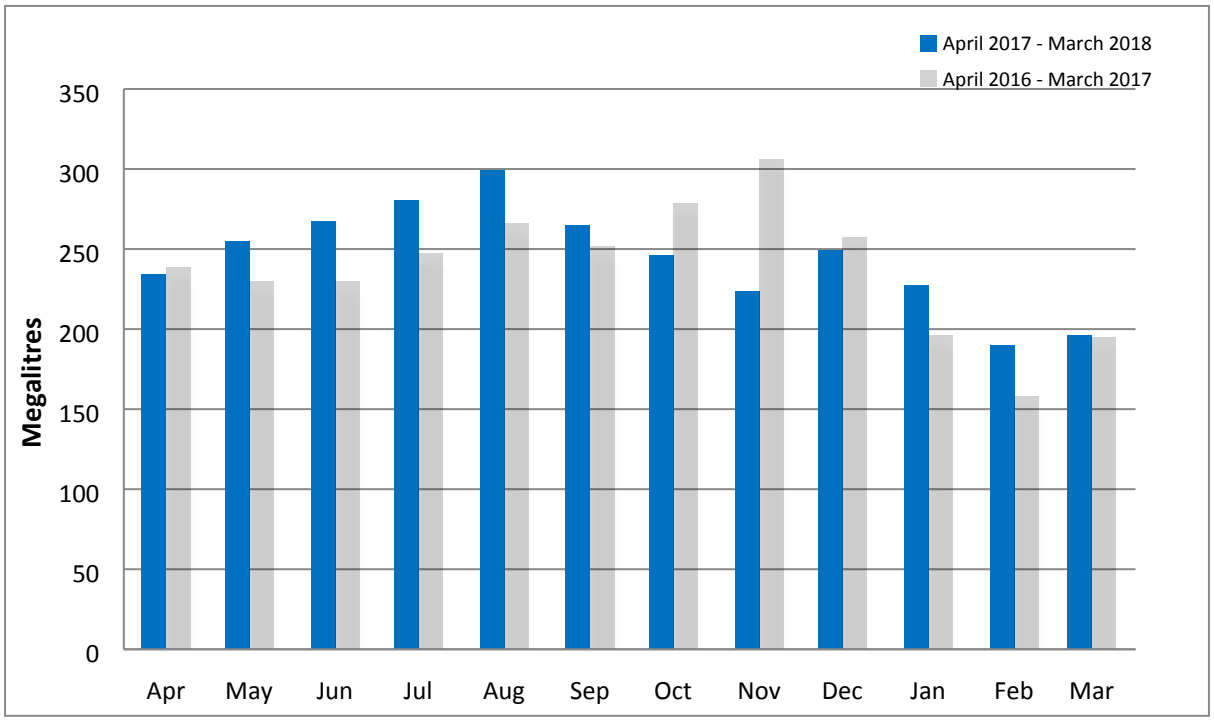
Fig 2. Mossman Scheme Monthly Consumption Figures



Port Douglas Water Supply

The total monthly consumption of water in Port Douglas can be seen in Figure 3 with 2018 figures for January, February and March trending slightly higher than for the same period in 2017.

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 increased with frequent rains and storm events but outside of these times was stable with good raw water flows. 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, ongoing chemical clean-in-place operations were undertaken, and general maintenance work continued.

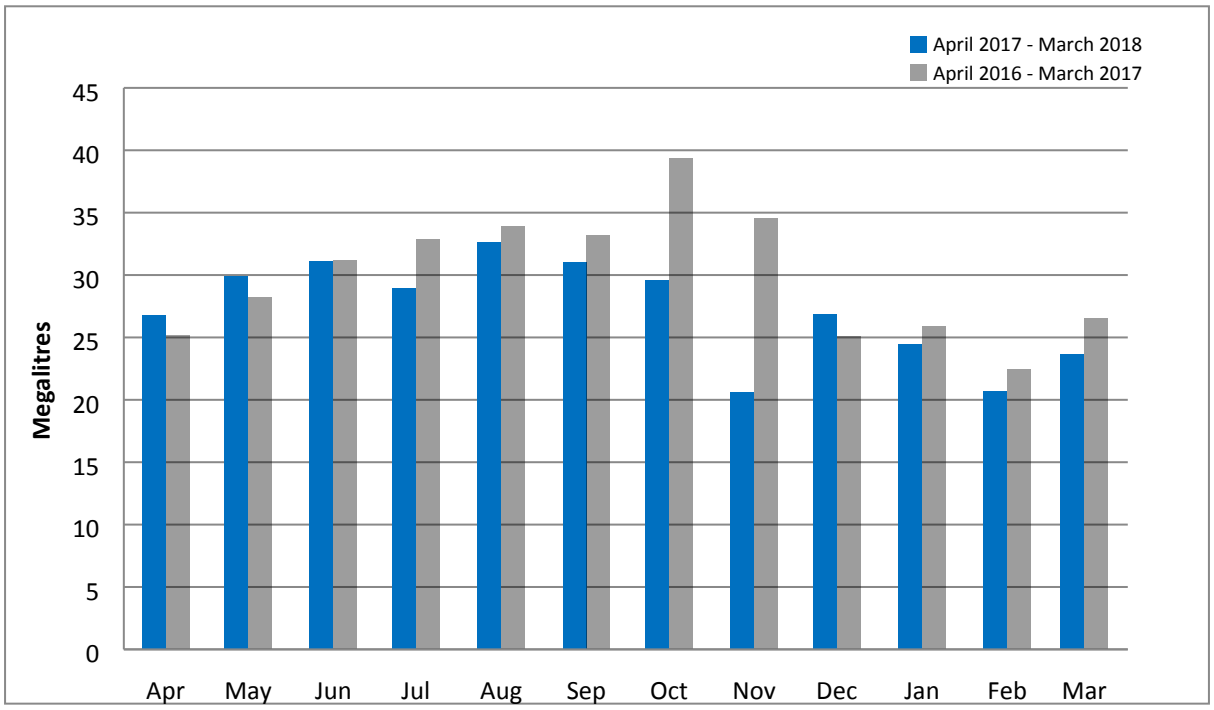
The new soda ash dosing system that was installed to increase the pH levels to just above the minimum guideline value of 6.5pH units in the treated water has been running well and producing stable pH levels averaging 6.7ph units.

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 with 2018 figures for January, February and March trending slightly lower than for the same period in 2017.

Fig 4. Whyanbeel Scheme Monthly Consumption Figures



Daintree Scheme

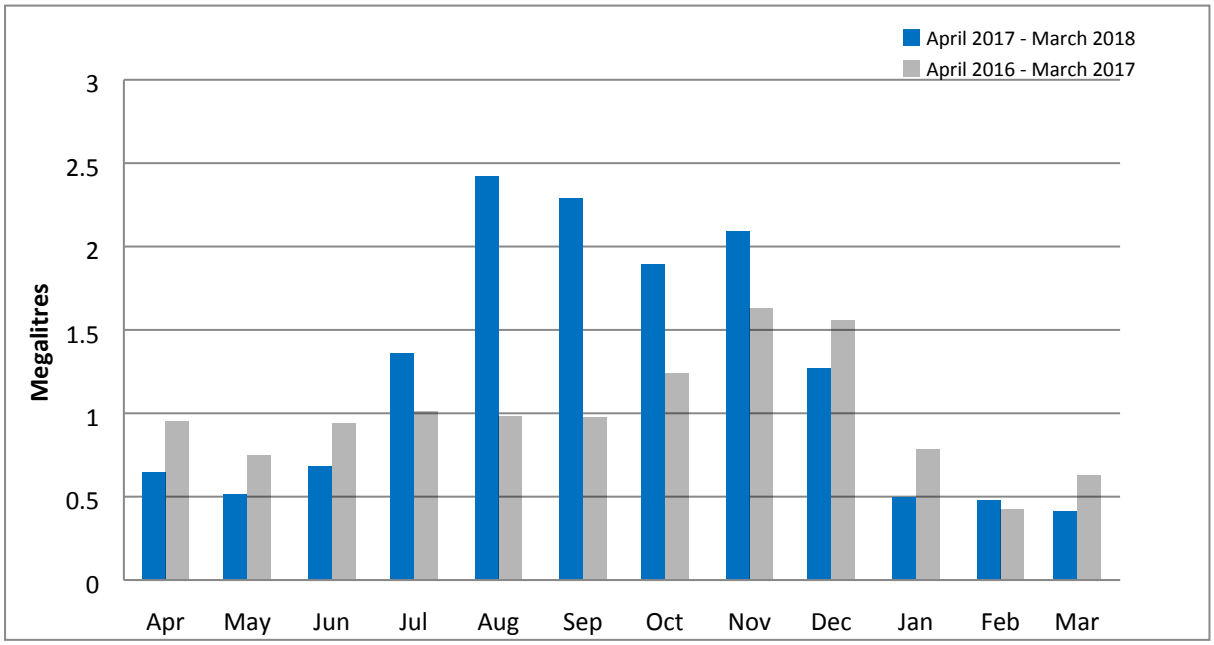
Daintree Water Treatment Plant met all demand requirements during the report period. Intake levels at Intake Creek increased with rain and storm events but stabilised outside of these times and were adequate to meet consumer demand.

To maintain UF filter efficiency, ongoing 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.

The total monthly consumption of water in the Daintree scheme can be seen in Fig 5 with 2018 figures for January and March trending moderately lower and February slightly higher than for the same period in 2017.

Fig 5. Daintree Scheme Monthly Consumption Figures



3. Water quality monitoring and results

Drinking water is sampled at intakes, reservoirs, treatment plants and in the reticulation network to ensure compliance with the Australian Drinking Water Guideline (ADWG).

For the reporting period a total of 408 treated and 18 raw water samples were taken in the 3 water supply schemes. A total of 267 were tested in the Douglas water laboratory, and 159 treated and raw water samples were tested by a NATA accredited laboratory for physical, chemical and microbiological parameters. All tested parameters in water samples taken during the reporting period were compliant with Australian Drinking Water Guidelines (ADWG) and standards required by the Water Supply Regulator and Queensland Health.

During the reporting period water quality in Mossman River and Saltwater Creek were monitored for the Department of Infrastructure, Local Government and Planning (DILGP) funded project regarding the additional water extraction site for Mossman water treatment plant. Monitoring included in-situ testing, together with a total of 13 water quality samples that were tested in the Douglas water laboratory.

Mossman/Port Douglas Supply Scheme

Average monthly values for key operational and compliance parameters can be seen in Table 3, 4 and 5 for treated water at the Mossman Treatment Plant, Port Douglas Reservoirs and Port Douglas/Mossman Reticulation network, respectively. Figure 6 indicates the daily turbidity trends of the raw water coming into the Mossman Water Treatment Plant and treated water for the period January to March 2018. During high rainfall events, raw water turbidity readings at the Rex Creek Intake were considerably higher and resulted in water treatment plant shut downs several times during the reporting period.

Table 3. Average monthly values for key operational and compliance parameters in treated water at Mossman Treatment Plant.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0-200	0.1-4.0	Max 5.0	<1	-	0-10
Jan-18	6.4	24.8	8	1.3	1.4	<1	<1	<1
Feb-18	6.3	24.5	5	1.3	1.4	<1	<1	<1
Mar-18	6.4	23.5	5	1.3	1.3	<1	<1	<1

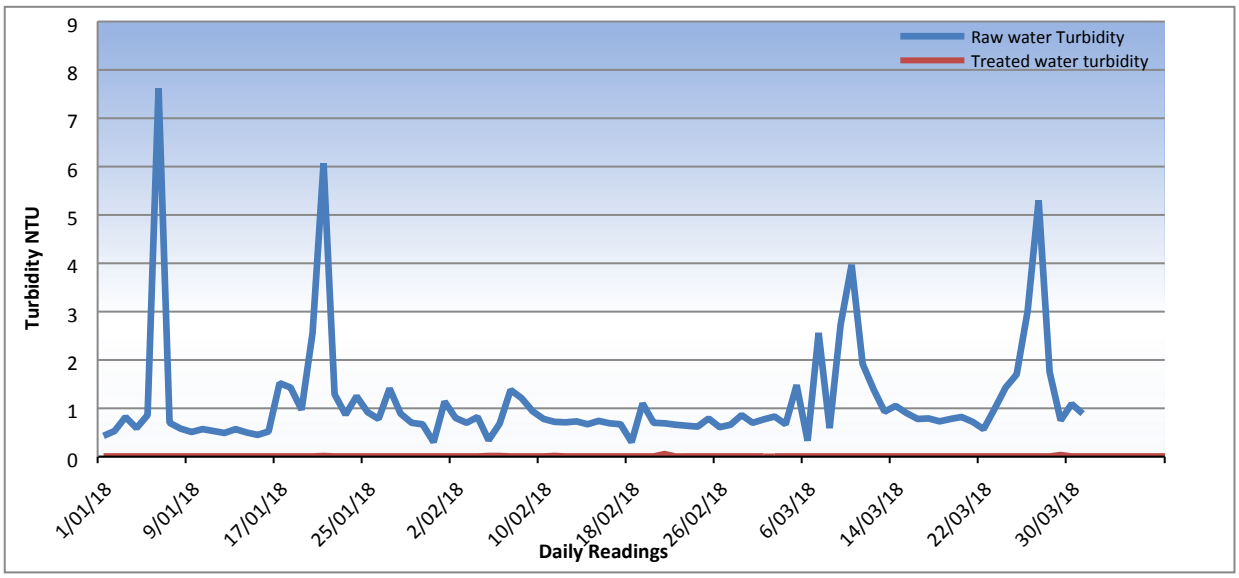
Table 4. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0-200	0.1-4.0	Max 5.0	<1	-	0-10
Jan-18	6.7	26.4	9	0.9	0.9	<1	<1	<1
Feb-18	6.7	27.0	7	0.9	0.9	<1	<1	<1
Mar-18	6.8	26.0	6	1.1	1.1	<1	<1	<1

Table 5. Average monthly values for key operational and compliance parameters in the Mossman/Port Douglas Reticulation Network.

Month	pH	Temp °C	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0.1-4.0	Max 5.0	<1	-	0-10
Jan-18	6.8	28.4	0.7	0.7	<1	<1	~3
Feb-18	7.0	28.4	0.7	0.7	<1	<1	<1
Mar-18	7.2	27.7	0.7	0.7	<1	<1	<1

Fig 6. Turbidity trends of incoming raw water to the Mossman Water Treatment Plant and treated water turbidity.



Average monthly values for key operational and compliance parameters can be seen in Table 6, Table 7 and Table 8 for treated water at the Whyanbeel Treatment Plant/Reservoir and Whyanbeel Reticulation Network, respectively. Figure 7 indicates the daily turbidity trends at the intake and treated water as recorded at the Whyanbeel Water Treatment Plant for the period January to March 2018.

Soda ash dosing that began in December 2017 has elevated the pH and total alkalinity within desired range.

Table 6. Average monthly values for key operational and compliance parameters in treated water at Whyanbeel Treatment Plant

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0-200	0.1-4.0	Max 5.0	<1	-	0-10
Jan-18	7.0	25.5	13	1.2	1.3	<1	<1	<1
Feb-18	6.9	25.2	11	1.3	1.3	<1	<1	<1
Mar-18	7.0	23.9	11	1.2	1.2	<1	<1	<1

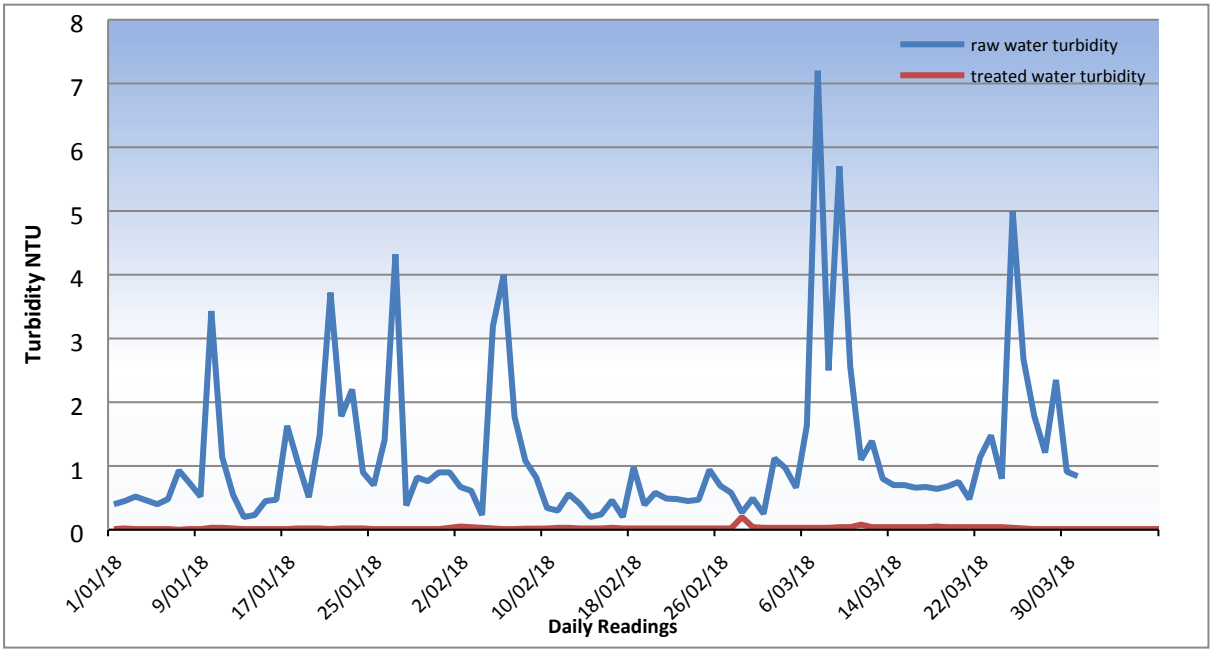
Table 7. Average monthly values for key operational and compliance parameters in the Whyanbeel Reservoir.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-200	0.1-4.0	Max 5.0	<1	-	0-10
Jan-18	7.4	29.1	15	1.0	1.1	<1	~1	<1
Feb-18	7.6	28.3	15	1.0	1.0	<1	~3	<1
Mar-18	7.9	28.4	12	1.0	1.1	<1	~1	<1

Table 8. Average monthly values for key operational and compliance parameters in the Whyanbeel Reticulation Network.

Month	pH	Temp °C	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0.1-4.0	Max 5.0	<1	-	0-10
Jan-18	7.3	29.0	0.7	0.8	<1	~1	~2
Feb-18	7.6	28.6	0.7	0.7	<1	~1	<1
Mar-18	7.9	28.5	0.7	0.8	<1	<1	<1

Fig 7. Turbidity trends of incoming raw water and treated water turbidity at the Whyanbeel Water Treatment Plant



Daintree Supply Scheme

Average monthly values for key operational and compliance parameters can be seen in Table 9 and Table 10 for treated water at the Daintree Treatment Plant and Daintree Reticulation network, respectively. Figure 8 indicates the daily turbidity trends at the intake and treated water as recorded at the Daintree water treatment plant for the period January to March 2018. Due to seasonal fluctuations, the water quality had a slight increase in total alkalinity however this was still within acceptable parameters. (*The increased elevation has no detrimental impact on consumer health – refer table below).

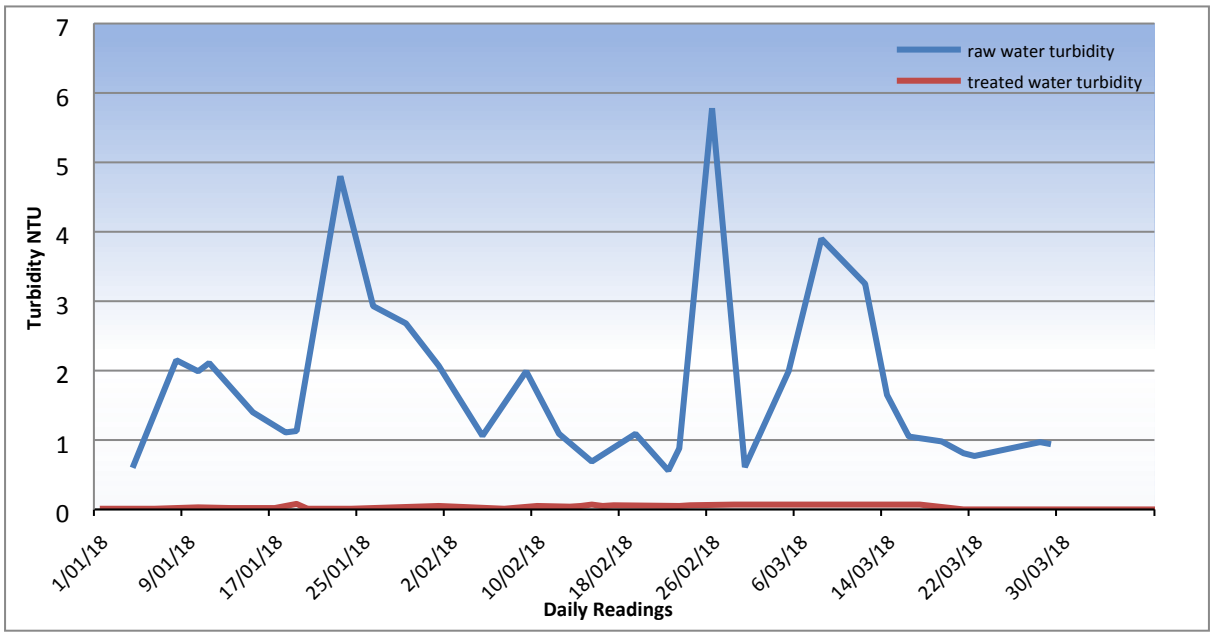
Table 9. Average monthly values for key operational and compliance parameters in treated water at Daintree Treatment Plant.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0-200	0.1-4.0	Max 5.0	<1	-	0-10
Jan-18	7.2	27.0	28	1.0	1.1	<1	~2	~5
Feb-18	7.1	25.6	22	0.8	0.9	<1	<1	<1
Mar-18	7.5	26.4	22	1.0	1.00	<1	<1	<1

Table 10. Average monthly values for key operational and compliance parameters in the Daintree Reticulation Network.

Month	pH	Temp °C	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0.1-4.0	Max 5.0	<1	-	0-10
Jan-18	7.7	27.3	0.8	0.9	<1	~1	<1
Feb-18	8.1	26.0	0.7	0.7	<1	<1	<1
Mar-18	8.3	26.8	0.8	0.8	<1	~2	<1

Fig 8. Turbidity trends of incoming raw water and treated water turbidity 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. Contractors serviced all major pump stations in the sewerage network to prolong the life of the pumps, and to reduce blockage events. Table 11 below shows the number of maintenance activities undertaken across all schemes.

Table 11. Wastewater Reticulation Services

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	1	5
Sewer Chokes	1	1
Sewer Main Breaks	1	0
HCB Repairs (House Connection Branch)	4	2
Odour Complaints	2	0

5. Influent and irrigation flows

Port Douglas Wastewater Treatment Plant

A total of 346,231 kL of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average flow was 3,847 kL/day. Tanker truck contractors delivered 410.75 kL of septage to the plant and 2,222 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 32% of the treated effluent was pumped to two resorts and the remaining discharged into the Dickson Inlet. The Sheraton Mirage received 81,105 kL and Palmer Sea Reef received 32,893 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 1,943 mm. On 26 March 2018, the highest rainfall on a day was recorded as 593 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

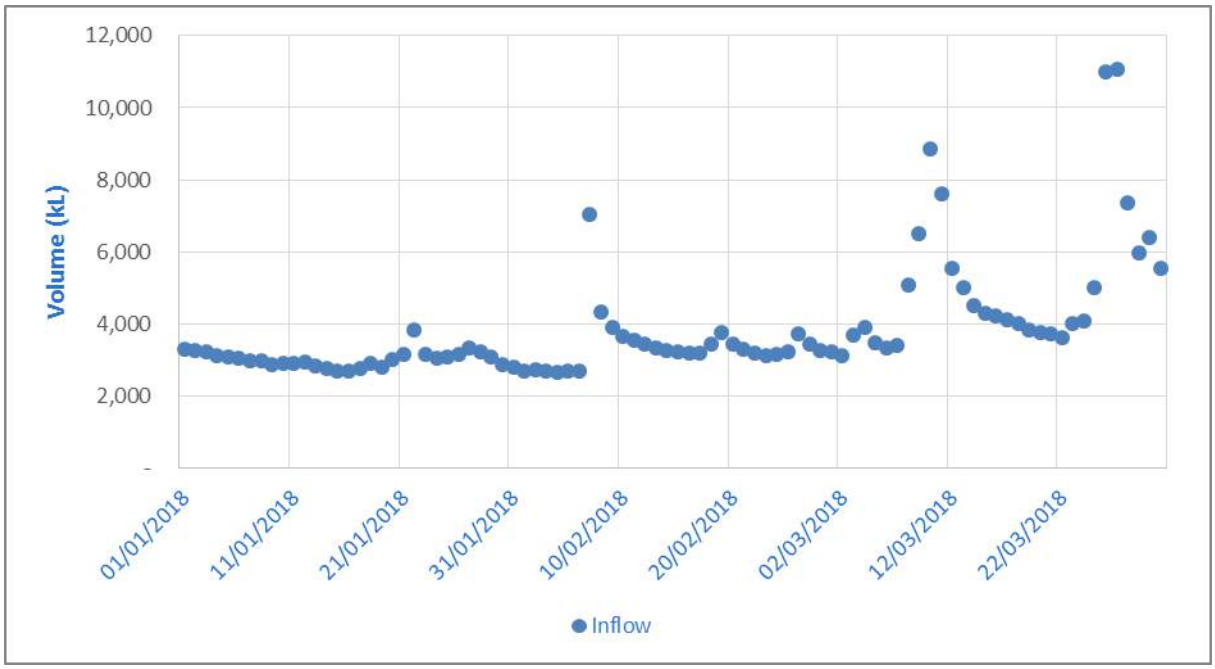
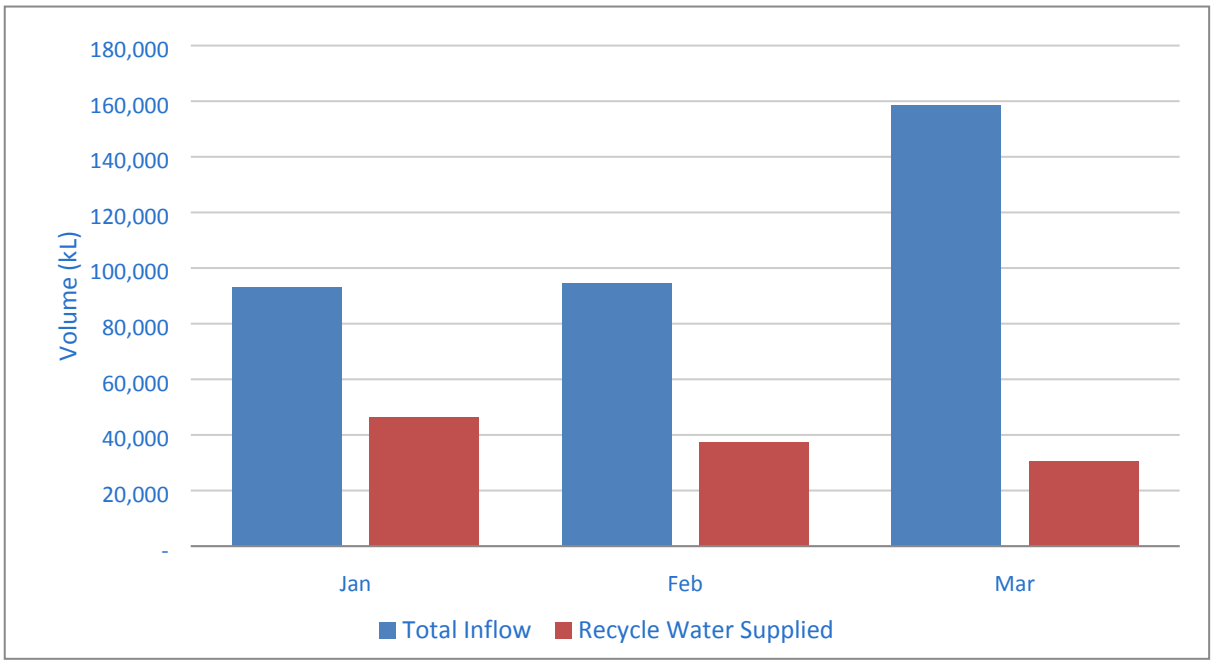


Fig 10. Port Douglas Total Monthly Flow 2018



Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 136,010 kL during the reporting period. The average flow was 1,511 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River. A total of 2,291.5 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 450 mm on 26 March 2018.

From the 12th to 16th and 19th of February 2018 the Mossman WWTP had a flow exceedance on a dry weather day. The Department of Environment and Science have reviewed the incidents and decided to take no further action on this matter.

Daily flows from the Mossman Wastewater Treatment Plant and total monthly flows for 2018 are presented in Fig 11 and 12 respectively.

Fig 11. Mossman Wastewater Treatment Plant Daily Flow

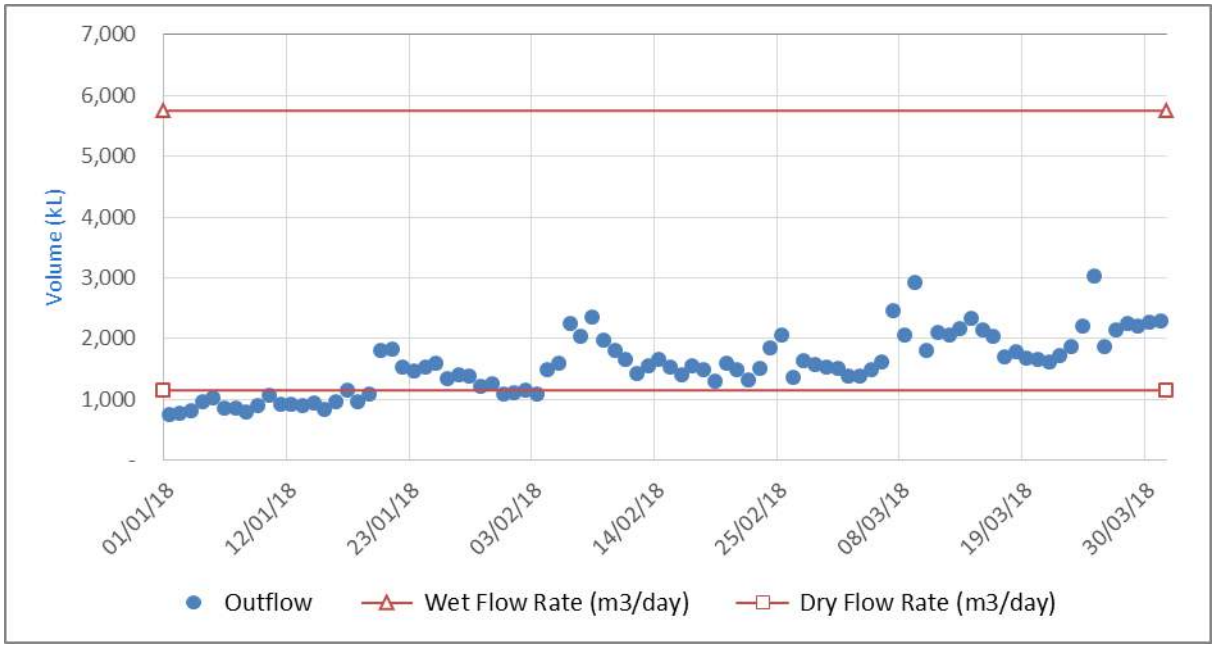
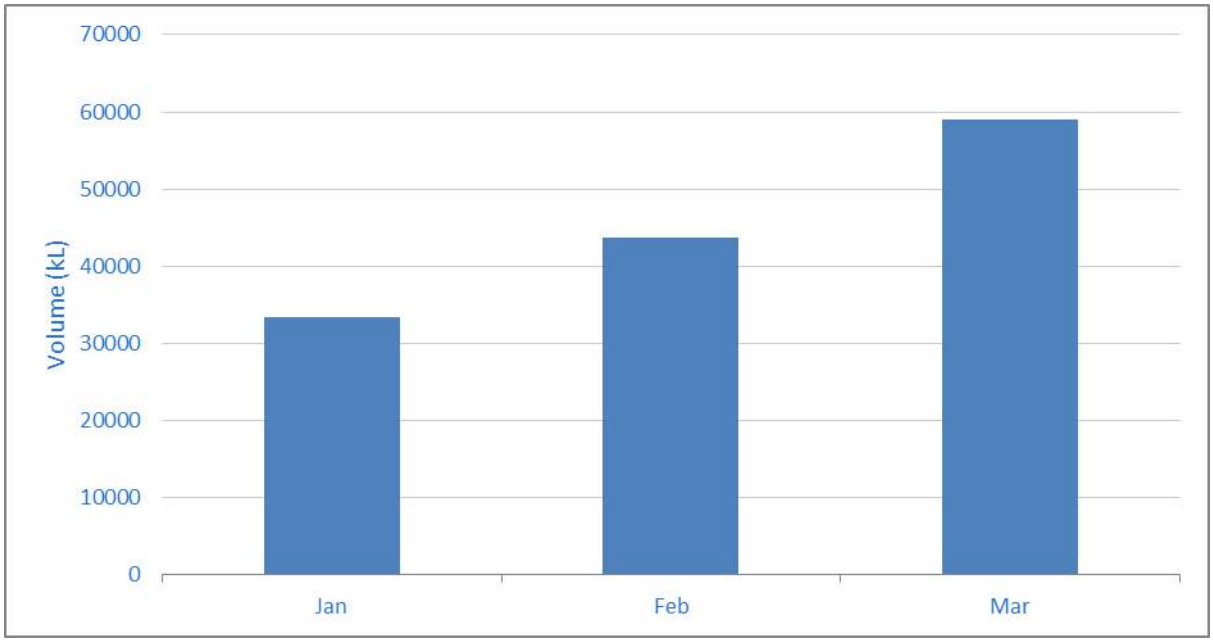


Fig 12. Mossman Wastewater Treatment Plant Total Monthly Flow 2018



6. Bio-solids Production

Bio-solids were produced at the dewatering plants at Mossman Wastewater Treatment Plant (11% solids) and Port Douglas Wastewater Treatment Plant (12.83% 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

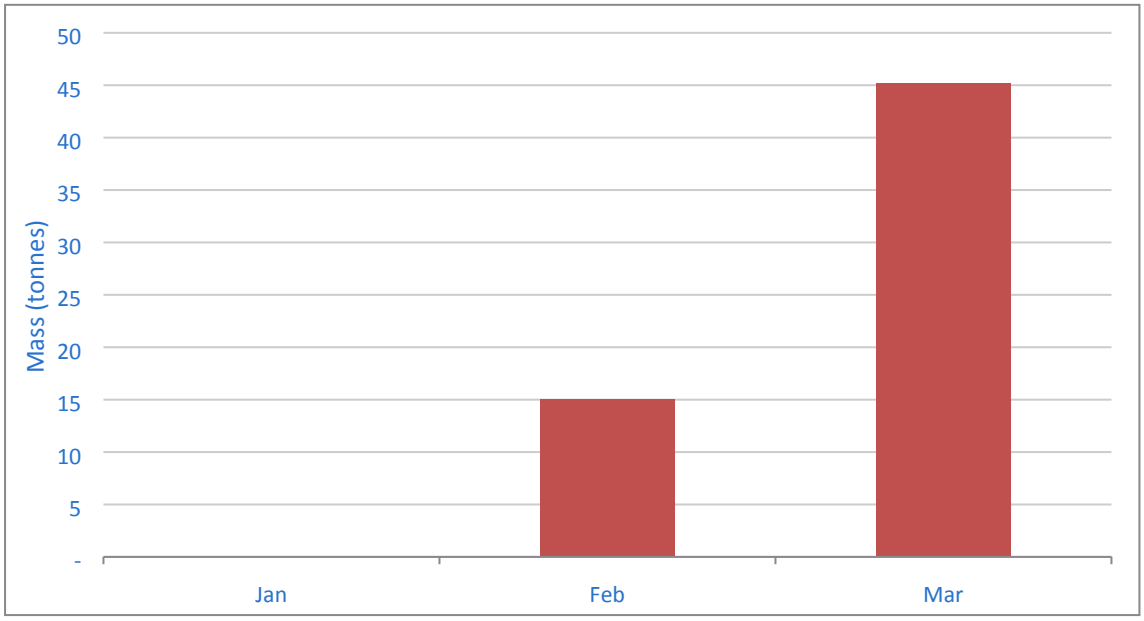
At Port Douglas Wastewater Treatment Plant, 363.04 tonnes of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet biosolids equates to 46.59 dry tonnes. The monthly bio-solids production trends can be seen in Figure 13.

Fig 13. Port Douglas Wastewater Treatment Plant monthly bio-solids production 2018

Mossman Wastewater Treatment Plant

At Mossman Wastewater Treatment Plant, 60.2 tonnes of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet biosolids equates to 6.56 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 January 2018**

Effluent quality and compliance

During the reporting period a total number of 157 wastewater compliance samples were taken from the treatment processes, bio-solids, final effluent, receiving waters and bores in both wastewater catchments. 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 catchment were compliant with maximum concentrations as per licence definitions and conditions.

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.

A bypass notification was reported to DEHP for rainfall event on the 25 March 2018 which produced 593mm of rainfall. Advice has been received from the department confirming no further action will be taken.

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

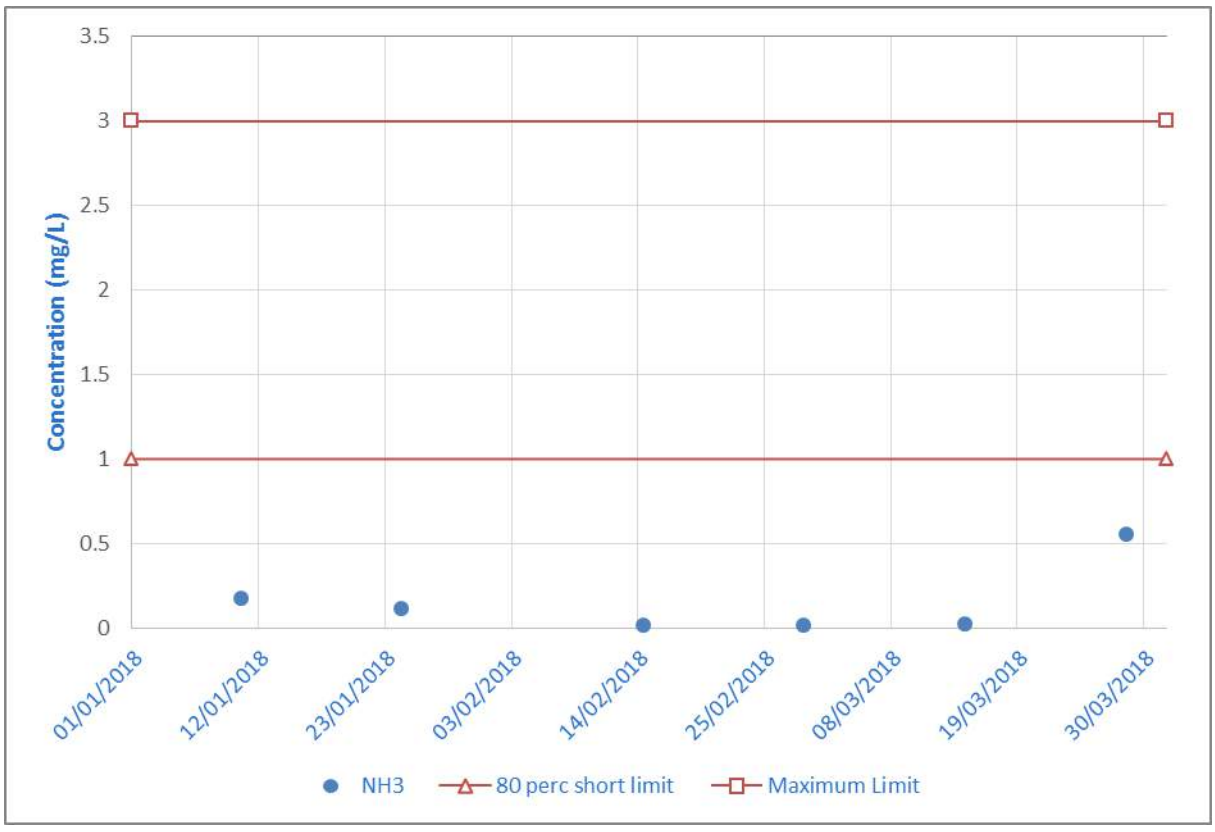


Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous

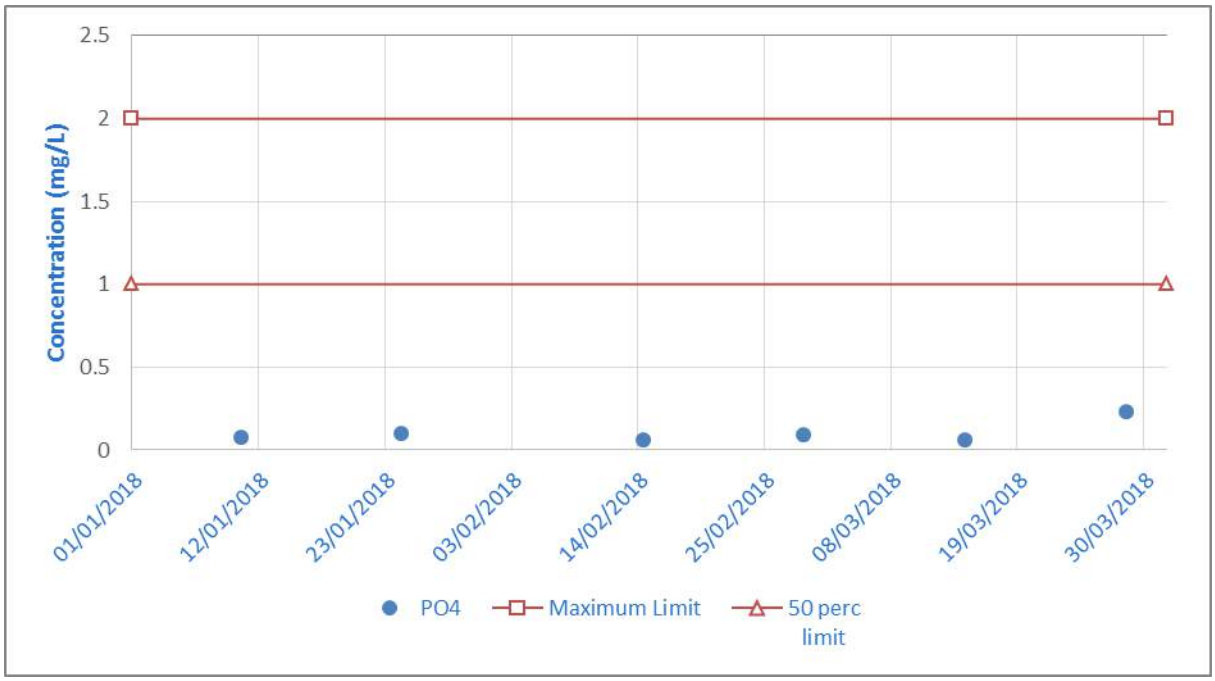


Fig 17. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids

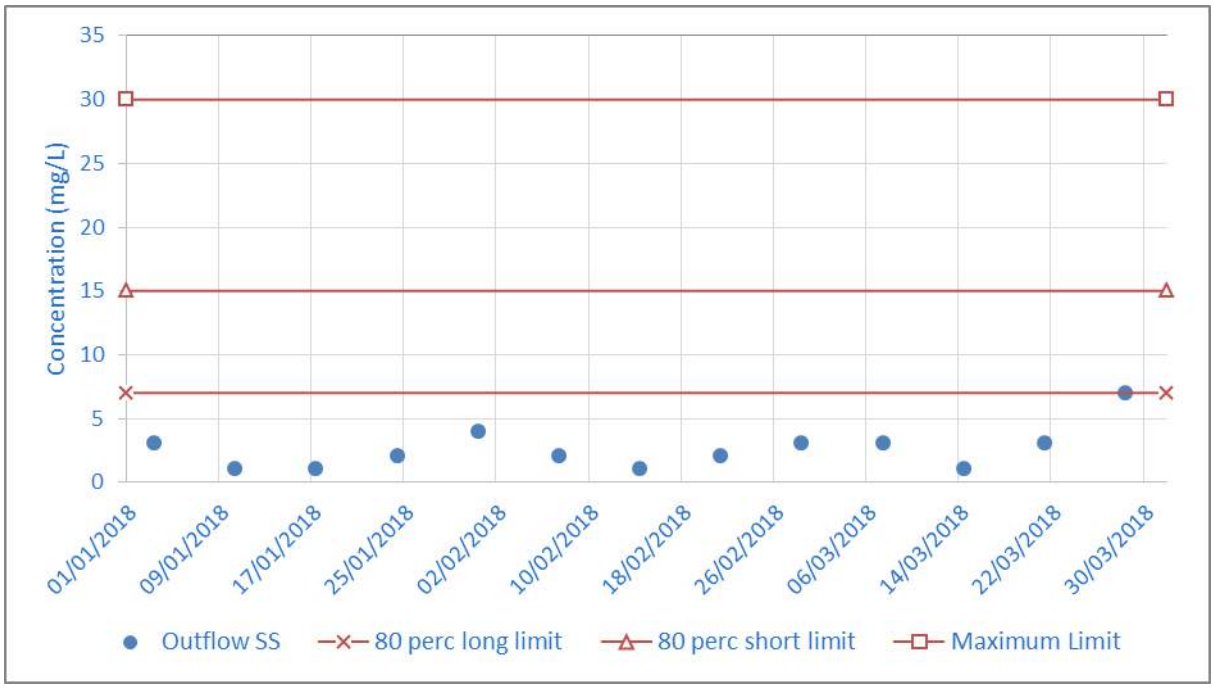
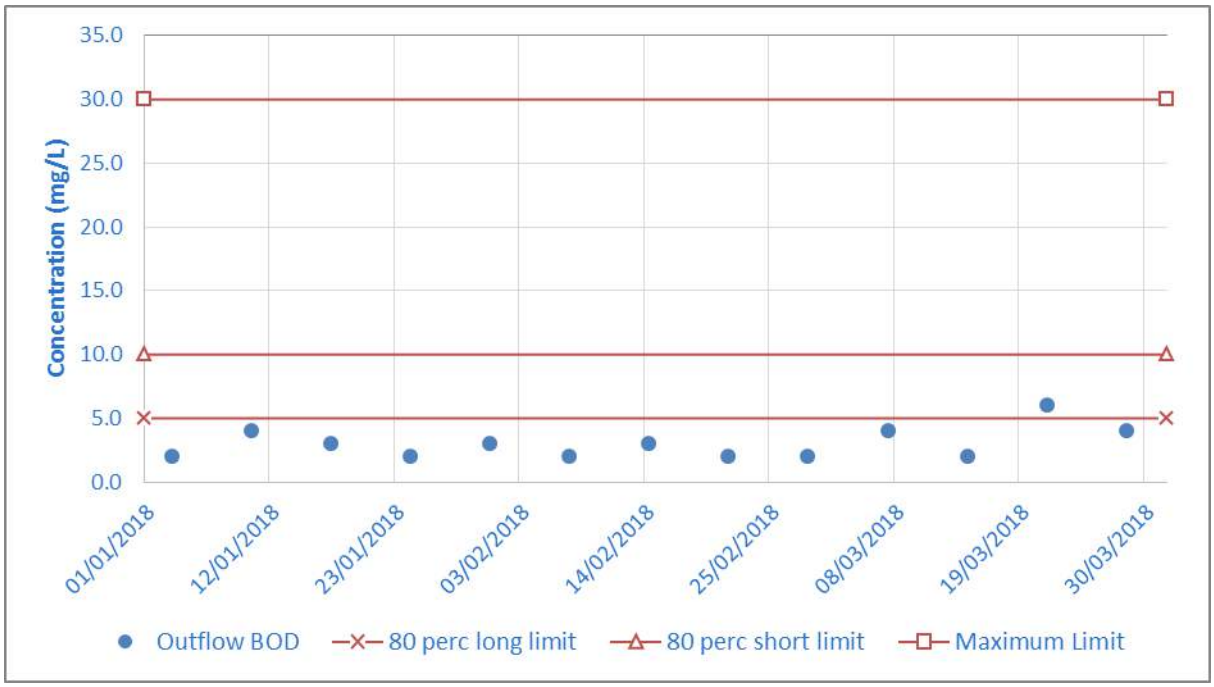


Fig. 18 Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)



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

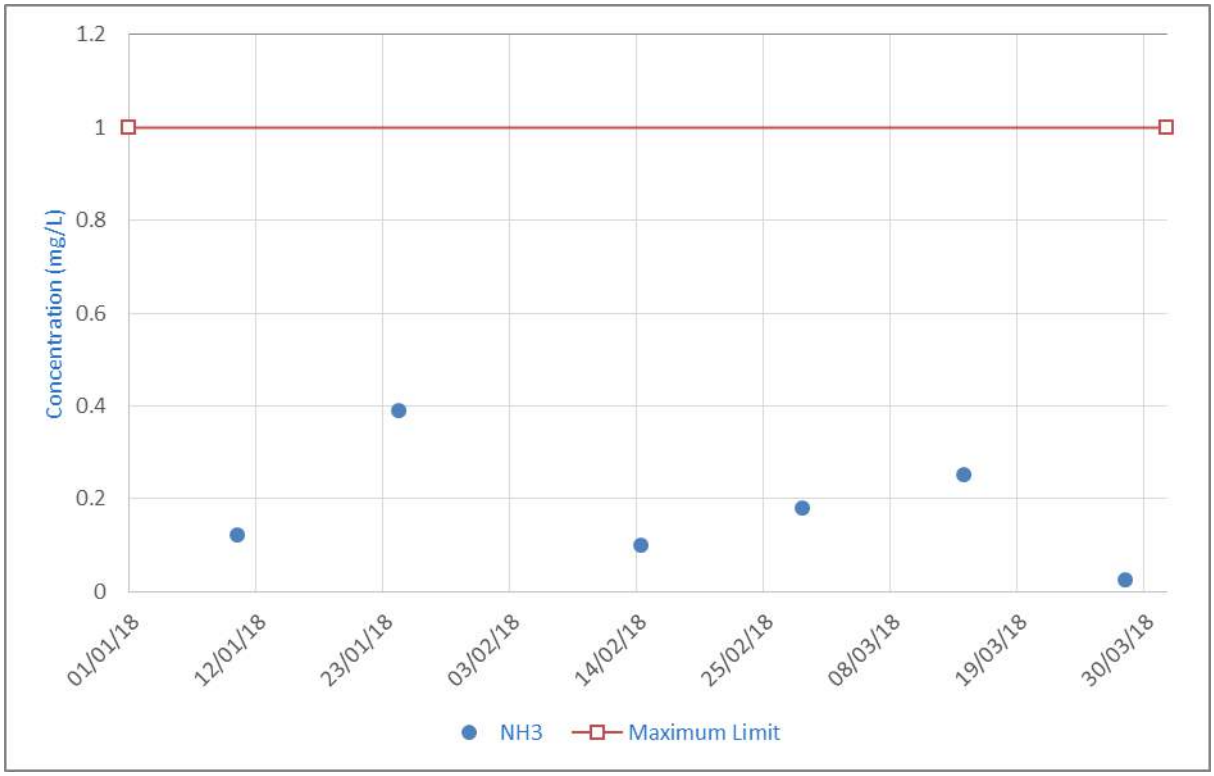


Fig. 20 Mossman WWTP Final Effluent Test Results for Total Phosphorous

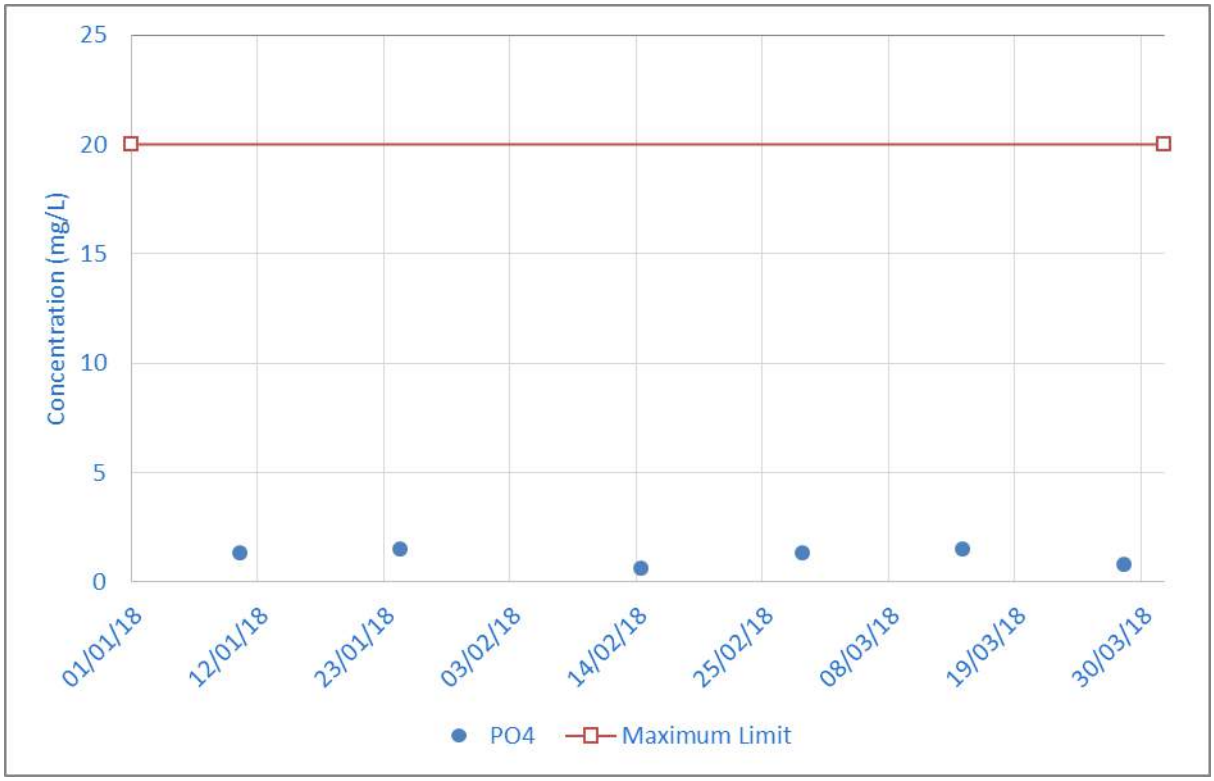


Fig. 21 Mossman WWTP Final Effluent Test Results for Total Suspended Solids

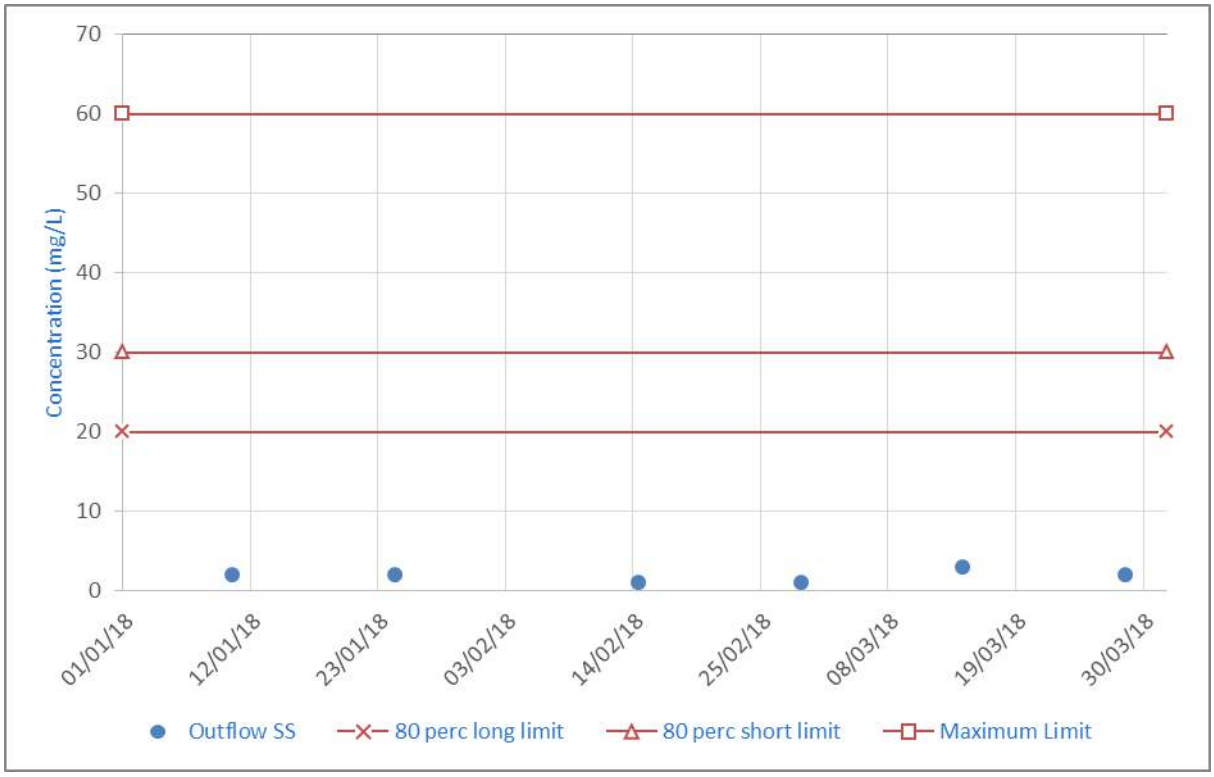


Fig. 22 Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)