5.3. WATER AND WASTEWATER QUARTERLY REPORT FOR THE PERIOD ENDING 31 MARCH 2017

GENERAL MANAGER Nicholas Wellwood, 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 2017 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 2017.

Whilst the results are generally positive the areas for improvement are noted and will be actioned for the additional focus of the branch over the next quarter. Notable capital improvements include the completion of the Newell Beach Mains Upgrade works, and the Port Douglas WWTP Sedimentation Basin (SED) Sealing works.

Council staff held a meeting with representatives from the Department of Energy and Water Supply (DEWS) to discuss the Regional Water Supply Security Assessment (RWSSA) Program, a joint collaboration between Council and DEWS to assist in the further understanding of Douglas Shire's water resilience. The DEWS officers were also taken on a tour of the Mossman Water Treatment Plant.

BACKGROUND

This report is the third Quarterly Report submitted by the Water and Wastewater Branch during the 2016/2017 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 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 2015-2016 Actions:

3.1.3 - Develop strategy, obtain licence and design wastewater upgrade to improve compliance at Mossman Wastewater Treatment Plant.
3.2.1 - Develop and Implement a Water Security Strategy for Port Douglas and Mossman.

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:

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 2017 **[5.3.1]**

Water and Wastewater Quarterly Report

1 January 2017 - 31 March 2017

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 Energy Water Supply (DEWS) and the Department of Environment and Heritage Protection (DEHP).

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. Reservoir and pump station checks and intake maintenance were also undertaken during the reporting period.

Cert III water management training continued for four members of the Water Team.

Newell Beach mains upgrade was completed with a new 100mm main and 22 new upgraded water services installed.

Newell Beach 100mm water main installation

Newell Beach post works

Some of the residents with properties that front the installation commended staff on their high standard of work, particularly on their quality of completion, and praised the hard work done in such a short timeframe.

Additionally, the Technical Officer Water Reticulation was singled out for his efforts in assisting a customer with a water meter problem in Craiglie. After the officer investigated

the matter, a solution was provided that rectified the issue. The customer was very happy with their 'excellent' solution and commended the officer on his "fantastic customer service skills" and that they couldn't "speak highly enough of him".

Table 1. Water Reticulation Services

Douglas Shire Reticulation (all schemes)	
Settlement Meter Reads	54
New Water Services Connections	7
Service Repairs	110
Water Mains Repairs	8
Water Quality Complaints	7
Flushing Events: Mossman/Port Douglas/ Cooya/ Newell	7
Flushing Events: Whyanbeel/Wonga	3
Flushing Events: Daintree/ De Meio	1

There were 7 water quality complaints during the reporting period, as shown in Table 2 below. All issues were resolved to the satisfaction of the customers.

Table 2. Water Complaints

Address	CRM No & Date	Nature of water complaint	How it was resolved	Response Time
6325R Captain Cook Highway	2017/3932 5/1/17	Metallic tasting water	Main and meter flushed and was resolved	30 mins
647R Captain Cook Highway	2017/39263 5/1/17	Foul taste in water	Main and meter flushed and was resolved	30 mins
25 Marlin Drive Wonga	2017/39709 17/1/17	Foul taste in water	Main and meter flushed and was resolved	30 mins
5 Cyril Close Newell	2017/39959 23/1/17	Concerned there were excess chemicals in the water	Main and meter flushed and was resolved	45 mins
175R O'Donoghue Road Syndicate	2017/40682 3/2/17	Water had a chemical smell and taste	Main and meter flushed and was resolved	3.5 hrs
45 Kalkuri Close Wonga	2017/40798 6/2/17	Water had a bad smell and taste	Main and meter flushed and was resolved	2 hrs
51 Macrossan Street Port Douglas	2017/42340 9/3/17	Discoloured water	Issue was an internal problem caused by maintenance crew on site at the business	30 mins

2. Water schemes and potable water consumption

Regional Water Supply Security Assessment (RWSSA) Program

A meeting was held on 3 February 2017 with two DEWS representatives to discuss the joint partnership entered into between Council and DEWS involving the Regional Water Supply Security Assessment (RWSSA) program. The program aims to assist councils in confirming the future reliability of community water supplies, and where applicable, assisting in identifying any potential risks to water supply security. The final outcome of the program will be a clearer model of how projected future water supply and demand in the Douglas Shire water reticulation schemes could impact on the existing infrastructure and resources, particularly with consideration to the possibility of less rainfall events in the future. The collaboration will be ongoing, and a first draft of the modelling is intended to be provided to Council in May 2017.

The meeting was a great opportunity to discuss the unique operations in the Douglas Shire, and to build on the good relationship with the department. Post meeting, the representatives were taken on a tour of the Mossman WTP and surrounding area to show firsthand the catchment area to assist in their understanding of Council's plant and operations.

All Schemes

Raw Water quality was good in all intakes averaging below 1.0 NTU except for storm turbidity events. The intake levels all remained relatively high due to the frequent rain events.

Rain squalls continued with heavy falls causing frequent flooding in the water plant intake creeks. There were a high number of consecutive raw water turbidity events with subsequent impacts to plant operations. The rainfall occurrences during the reporting period improved intake levels. Additionally, with further drops in the consumption levels by customers, all water restrictions throughout Douglas Shire were cancelled on 9 February 2017.

Throughout the schemes, pump stations performed well with no incidents. The Craiglie pump station was fully operational and the gas chlorination plant performed well. A new pump was installed under the Capital Works program. The calcium hypo automated dosing facilities at Flagstaff and Rocky Point reservoirs were operational and maintained stable chlorine levels. Reservoir storage levels were adequately maintained.

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

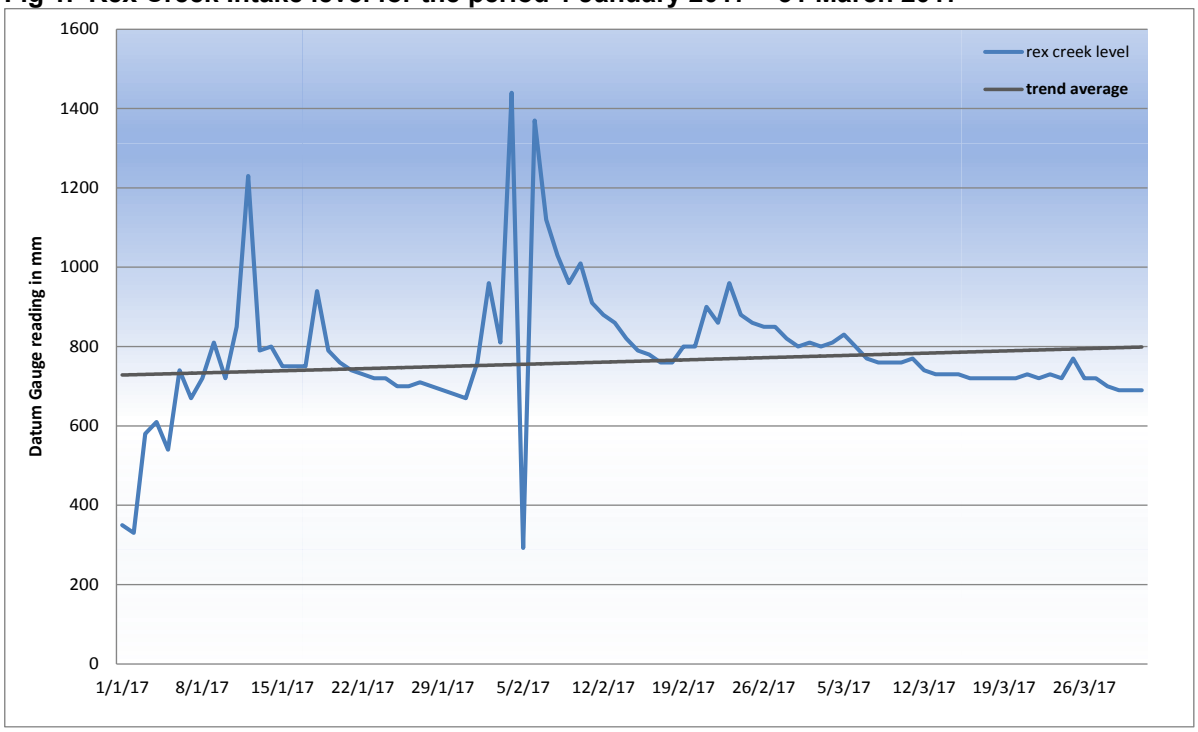
Mossman/Port Douglas Scheme

Mossman Water Treatment Plant met all demand requirements during the reporting period. Early in the reporting period Level 2 water restrictions were in place to assist in lowering consumer demand to ensure supply of water and to prevent the extraction limits being surpassed. With reduced occupancy after the Christmas holiday period assisting with lower consumption levels, and frequent rainfall supplementing the intake levels, the treatment plant was able to operate within average demand requirements typical of the seasonal trends.

Rex Creek intake levels were erratic throughout the report period due to heavy rain events causing large fluctuations in water supply levels. Maximum instantaneous demand flow rate was at 370L/s which was well above the average demand requirement of 103L/s.

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

Fig 1. Rex Creek Intake level for the period 1 January 2017 – 31 March 2017

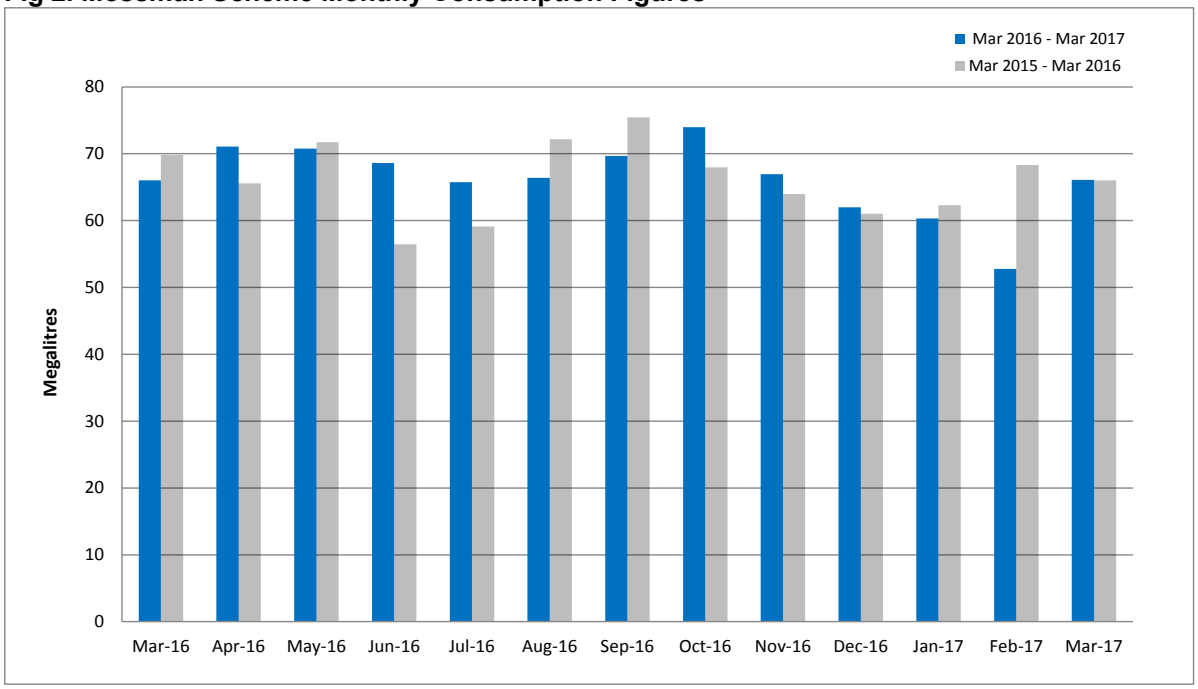


Mossman Water Treatment Plant was operating at demand capacity. Current trends indicate decreasing consumption typical of water restrictions and seasonal trends.

Mossman Water Supply

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

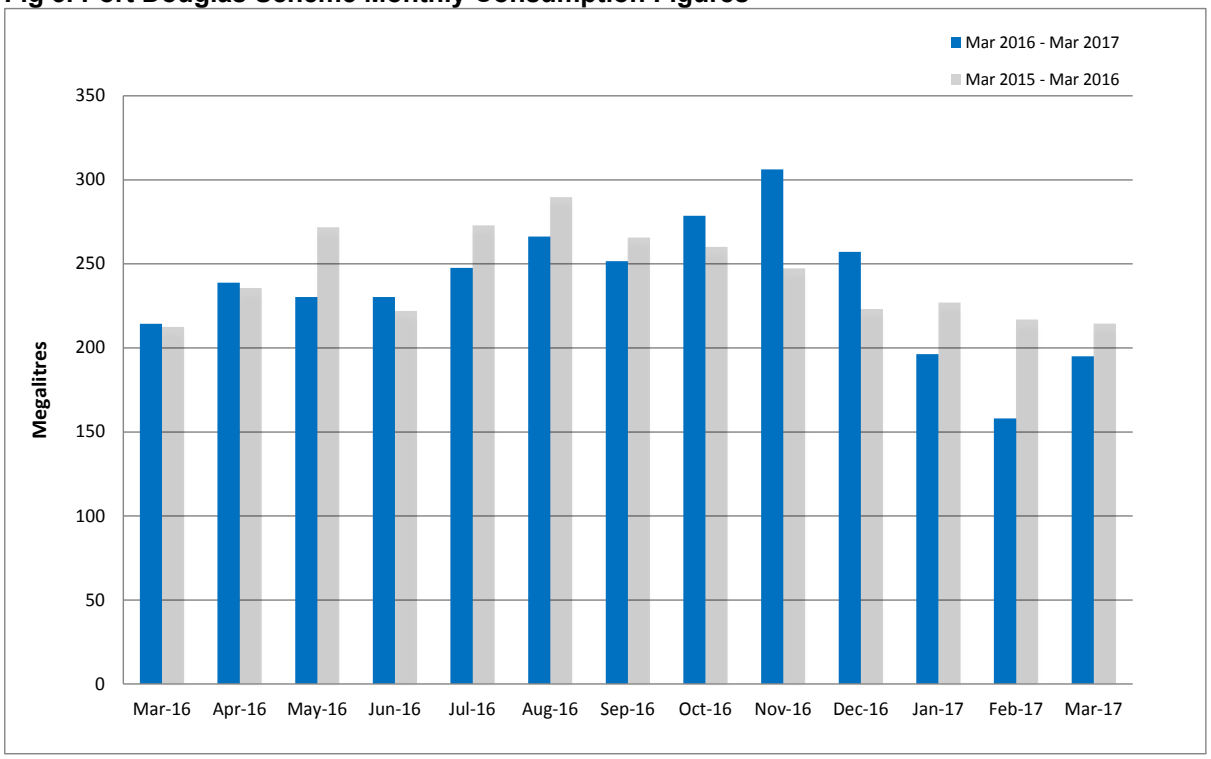
Fig 2. Mossman Scheme Monthly Consumption Figures



Port Douglas Water Supply

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

Fig 3. Port Douglas Scheme Monthly Consumption Figures



Whyanbeel Scheme

Whyanbeel Water Treatment Plant was operating at capacity to meet increasing demand early in the reporting period. Intake levels at Little Falls Creek had continued to drop and although consumption demand levels decreased due to the Level 1 and 2 water restrictions, the rain shortfall put pressure on meeting demand. Rainfall occurrences in the middle of the reporting period increased the intake levels to enable the plant to meet demand and at the same time, consumer demand dropped.

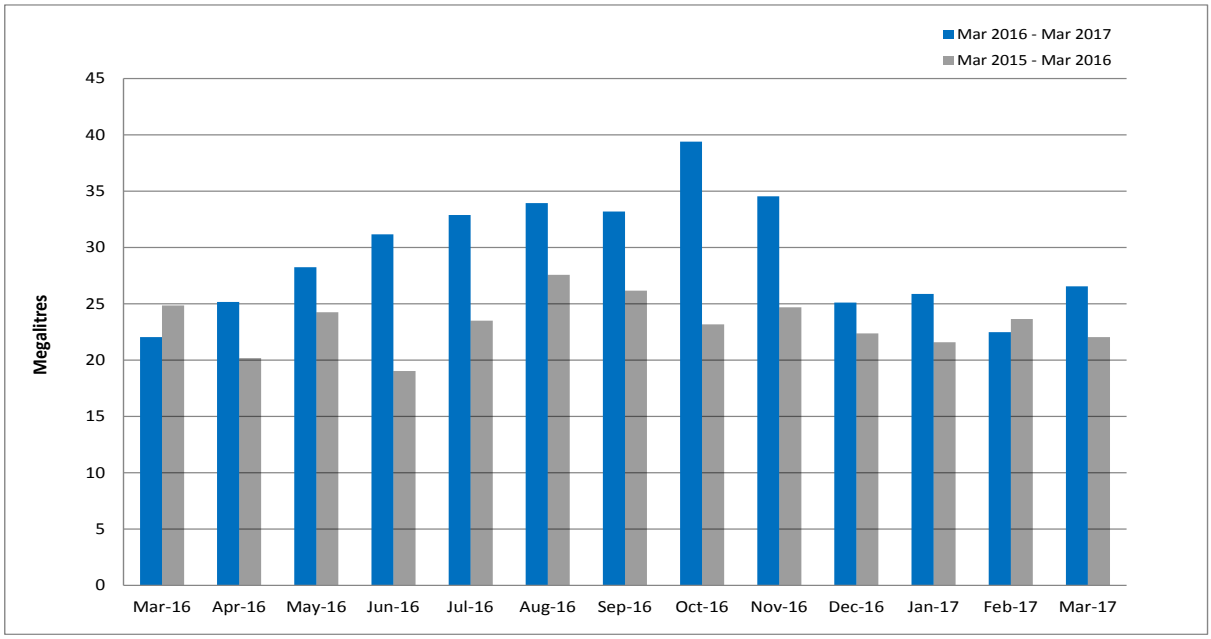
The Ultra Filtration rack was fully operational during the reporting period. The UV disinfection system was enabled to provide additional assurance in relation to water quality compliance. Maintenance works undertaken included repairs to the cartridges to ensure compliance with UF rack integrity test limits, valve replacement and general maintenance work.

There were no water quality reportable incidents during the report period.

Whyanbeel Water Supply

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

Fig 4. Whyanbeel Scheme Monthly Consumption Figures



Daintree Scheme

Daintree Water Treatment Plant operated at capacity to meet increased demand during the report period. Intake levels at Intake Creek fluctuated from very low, to high during flood events. Some blockages of the intake were experienced causing a number of plant shutdowns but adequate storage levels were maintained to meet consumer demand.

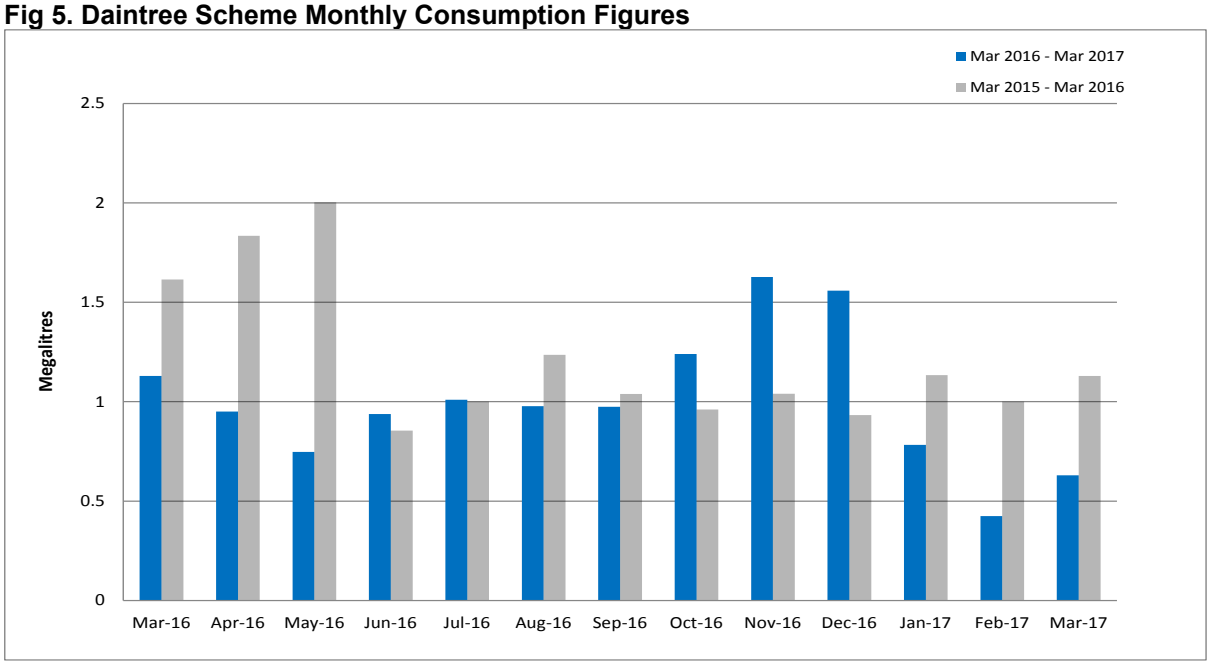
To maintain UF filter efficiency, ongoing chemical clean-in-place operations were undertaken. Maintenance works included Cartridge repairs to ensure compliance with UF rack integrity test limits, valve replacement and general maintenance work.

There were no water quality reportable incidents during the report 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, treatment plants and in the reticulation network to ensure compliance with the Australian Drinking Water Guideline (ADWG).

For the period 1 January 2017 to 31 March 2017 a total of 520 treated and 11 raw water samples were taken in the 3 water supply schemes. A total of 42 samples were tested in the Douglas Water Laboratory and 489 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.

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. Fig 6 indicates the daily turbidity trends at the intake and treated water as recorded at the Mossman Water Treatment Plant for the period January to March 2017. There was a telemetry failure during a short period of time in March. A new radio transmitter was installed, and the telemetry system was reconfigured. No non-compliances occurred, and this was confirmed by two additional monitoring location data information.

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	0-25	0.1-4.0	Max 5.0	<1	-	0-10
Jan-17	7.86	22.8	9	1.32	1.39	<1	<1	<1
Feb-17	7.70	25.4	9	1.26	1.33	<1	<1	<1
Mar-17	7.77	25.7	11	1.17	1.25	<1	<1	<1

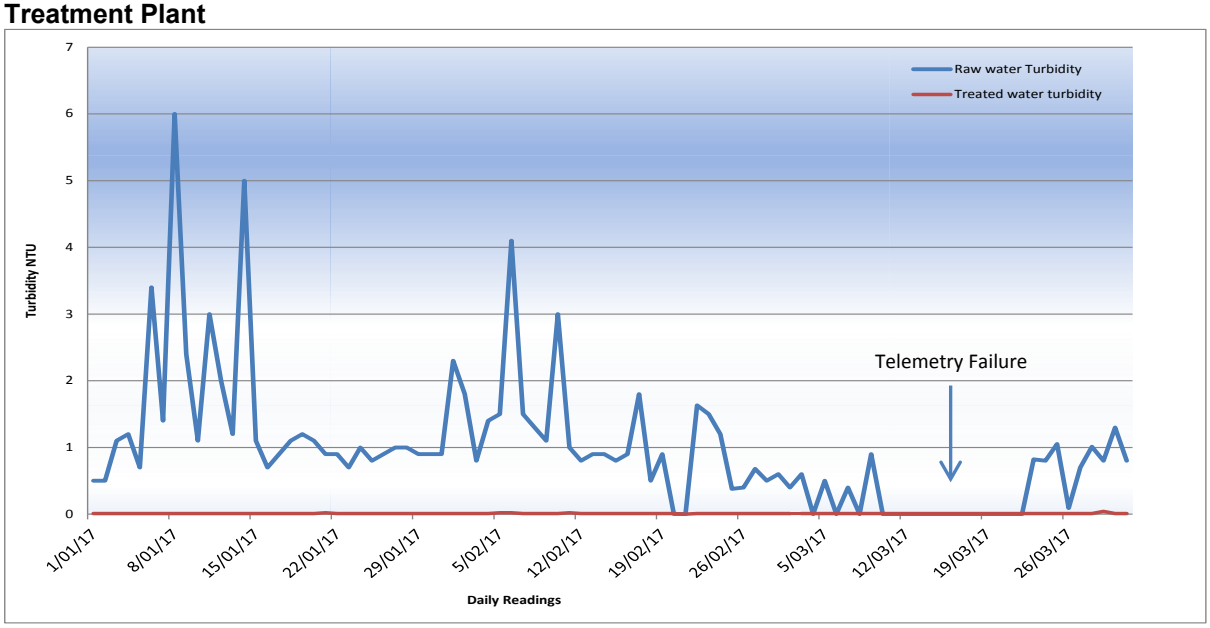
Table 4. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.

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	0-25	0.1-4.0	Max 5.0	<1	-	0-10
Jan-17	7.48	27.6	11.0	1.02	1.10	<1	2	<1
Feb-17	7.78	27.1	10.1	0.97	1.02	<1	3	<1
Mar-17	8.03	26.3	12.5	0.95	0.98	<1	6	<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-17	7.77	28.0	0.54	0.66	<1	<1	<1
Feb-17	8.26	28.8	0.77	0.79	<1	<1	<1
Mar-17	8.50	28.0	0.78	0.85	<1	<1	<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 Table 6. and Table 7. for treated water at the Whyanbeel Treatment Plant/Reservoir and Whyanbeel Reticulation Network, respectively. Fig 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 2017.

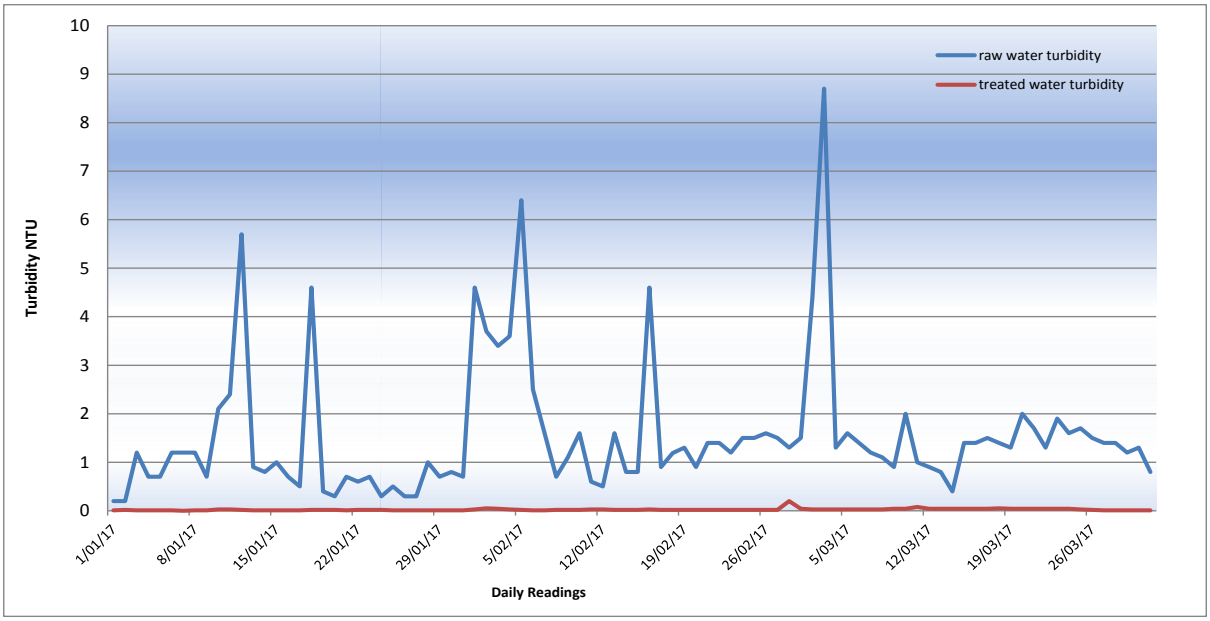
Table 6. Average monthly values for key operational and compliance parameters in treated water at Whyanbeel Treatment Plant/Reservoir

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	0-25	0.1-4.0	Max 5.0	<1	-	0-10
Jan-17	7.75	23.5	4	1.14	1.24	<1	<1	<1
Feb-17	7.80	26.4	8	1.14	1.18	<1	<1	<1
Mar-17	7.65	25.5	5	1.25	1.25	<1	<1	<1

Table 7. 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-17	7.20	28.1	0.34	0.37	<1	1	<1
Feb-17	8.12	29.0	0.80	0.86	<1	1	<1
Mar-17	7.93	28.8	0.61	0.66	<1	1	<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 8. and Table 9. for treated water at the Daintree Treatment Plant and Daintree Reticulation network, respectively. Fig 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 2017.

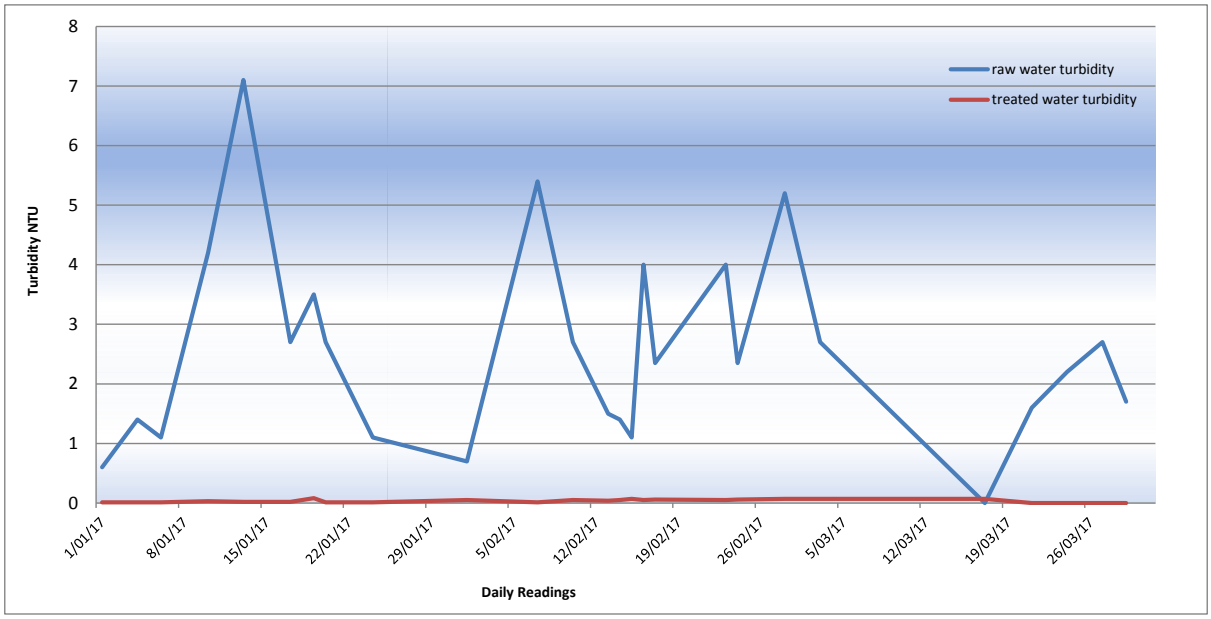
Table 8. Average monthly values for key operational and compliance parameters in treated water at Daintree Treatment Plant.

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	0-25	0.1-4.0	Max 5.0	<1	-	0-10
Jan-17	7.08	25.2	25	1.00	1.13	<1	1	<1
Feb-17	7.44	27.4	27	0.92	0.98	<1	1	<1
Mar-17	7.55	27.0	30	0.75	0.75	<1	1	<1

Table 9. 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-17	7.15	27.2	0.74	0.78	<1	1	<1
Feb-17	7.72	27.5	0.78	0.84	<1	<1	<1
Mar-17	8.00	28.0	0.70	0.70	<1	1	<1

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



4. Plumbing and drainage

Plumbing staff were very busy working on the backflow audit program as well as working on realigning the plumbing approval process during the reporting period. Plumbing and drainage applications increased by almost 50% since the last reporting period. Please refer to Table 10. below.

Table 10. Plumbing and Drainage Services

No. of plumbing and drainage applications received	52
No. of plumbing and drainage permits issued	52
No. of plumbing and drainage inspection undertaken	72
No. of properties audited – Backflow	280
No. of registrations received - Backflow	216

A plumbing forum is being organised to be held in June for all stakeholders in the industry to be involved as an information evening. Representatives from QBCC and IPIQ will be in attendance along with a trade demonstration from Reece Plumbing Centres.

Wastewater

5. Wastewater reticulation services

General maintenance programs were carried out at the reticulation networks and 31 pump stations in the Mossman and Port Douglas catchments. Electrical storms during this period caused power outages at some pump stations, and some electrical faults to pumps and control equipment that were quickly rectified.

The Port Douglas WWTP inlet screen faulted due to a mechanical failure but was quickly repaired, and the inlet works grit chamber had a new drive motor and gearbox installed.

Due to high volume flow measurements in the Mossman WWTP catchment during wet weather events, the sewer relining program continued with CCTV surveys of the sewer mains and jump ups in South Mossman to establish areas of infiltration from rainwater. Some broken branches were discovered and repaired which should minimise inundation flow entering the sewer infrastructure.

Due to the infiltration of rainwater, the Mossman Wastewater Treatment Plant had two non-compliance incidents for the reporting period which were classed as exceedances on non-wet days. The quarterly WaTERS report was submitted to DEHP for each treatment process.

Table 11. Wastewater Reticulation Services

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	6	3
Sewer Chokes	2	0
Sewer Main Breaks	0	0
HCB Repairs (House Connection Branch)	1	4
Odour Complaints	0	0

6. Liquid trade waste

The Technical Officer Water departed from Council during the reporting period and the inspection program for liquid trade waste was constrained as a consequence. Additional officers from Wastewater assisted with inspections when available. Potential candidates have been shortlisted for the vacant position and appointment expected in early June 2017.

Table 12. Liquid Trade Waste Services

Total Businesses Holding an Approval	146
Change of Business Ownership	5
Business Closures	2
New Approval Applications	1
Renewal Applications Received	14
Annual Inspections Undertaken	14

7. Influent and irrigation flows

Port Douglas Wastewater Treatment Plant

A total of 261,820 kL of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average daily flow was 4107 kL/day. Tanker truck contractors delivered 349 kL of septage to the plant. Influent is treated in a Sequencing Batch Reactor (SBR) which produced compliant effluent during the reporting period. A total of 72% of the treated effluent was pumped to two resorts and the remaining discharged into the Dickson Inlet. The Sheraton Mirage received 66,038 kL and Reef Links received 38,905 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 1371 mm. On 18 January 2017, the highest rainfall on a day was recorded as 81 mm. Daily SBR flows and total monthly flows for 2017 are presented in Fig 9 and 10 respectively.

Fig 9. Port Douglas SBR Daily Flow

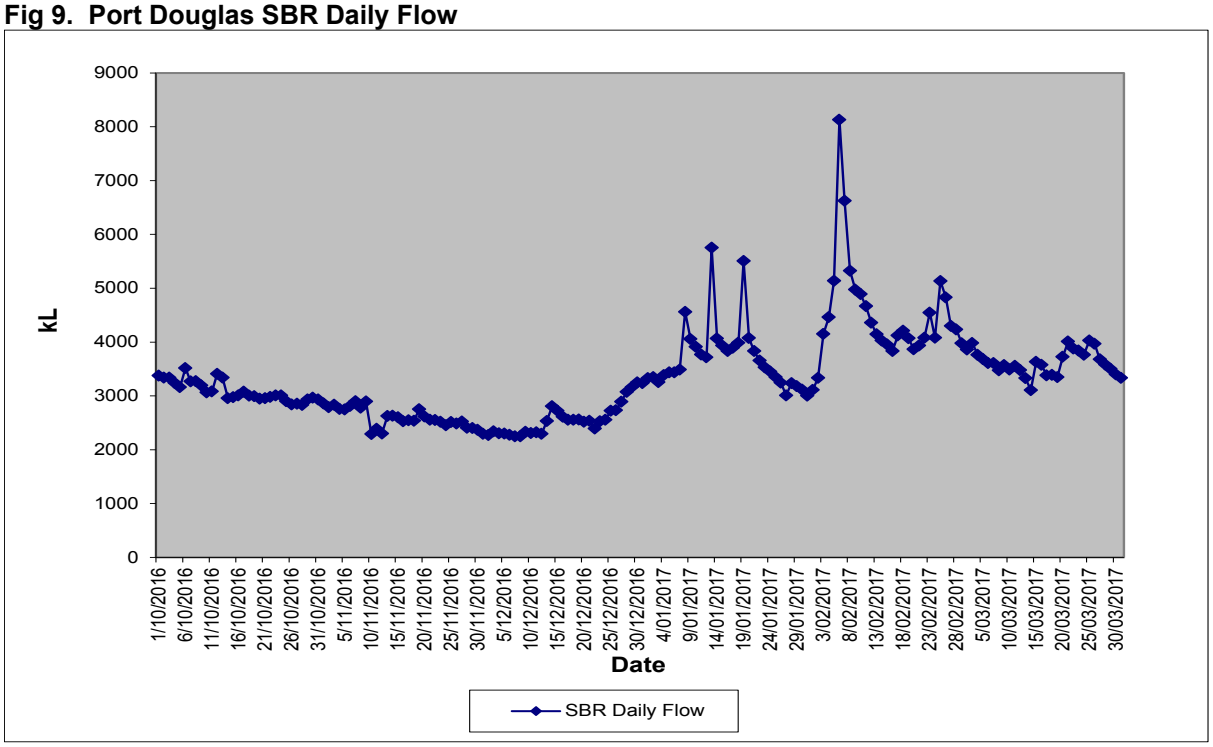
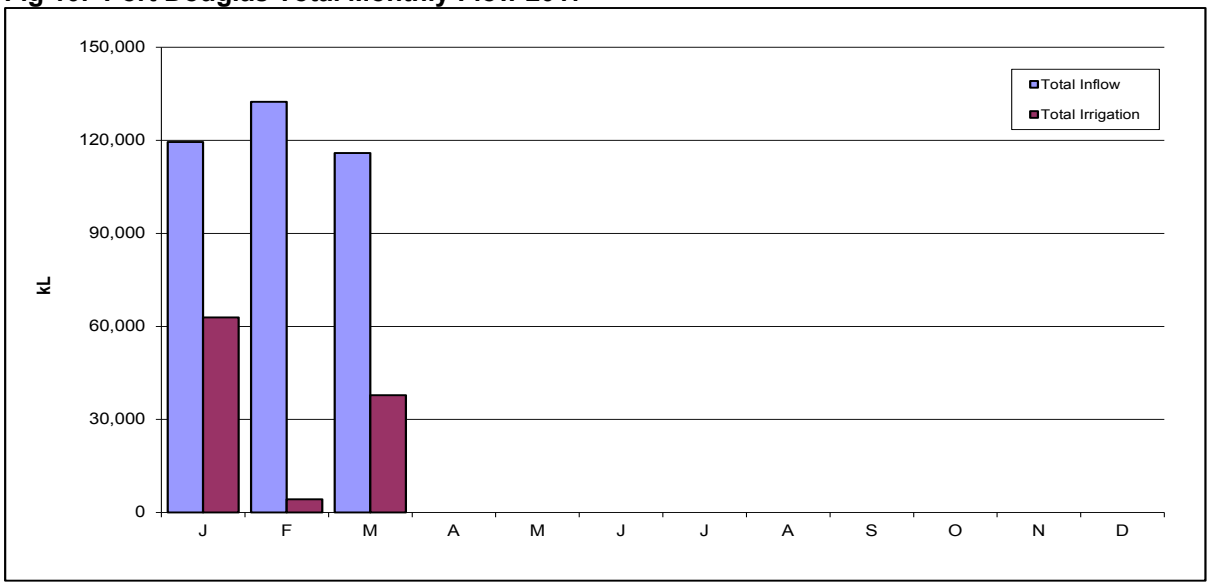


Fig 10. Port Douglas Total Monthly Flow 2017



Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 154,678 kL during the reporting period. The average daily flow was 1718 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River. A total of 1620.5 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 116.5 mm on 4 February 2017.

Daily flows from the Mossman Wastewater Treatment Plant and total monthly flows for 2017 are presented in Fig 11 and 12 respectively.

Fig 11. Mossman Wastewater Treatment Plant Daily Flow

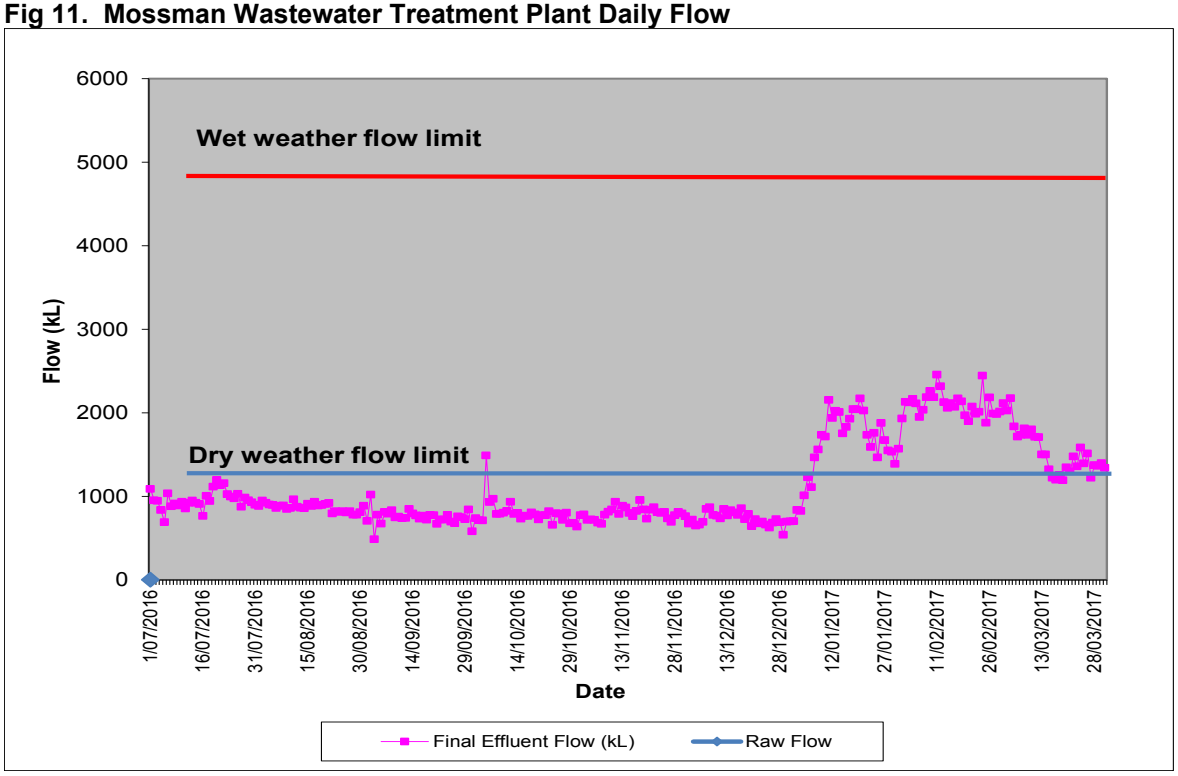
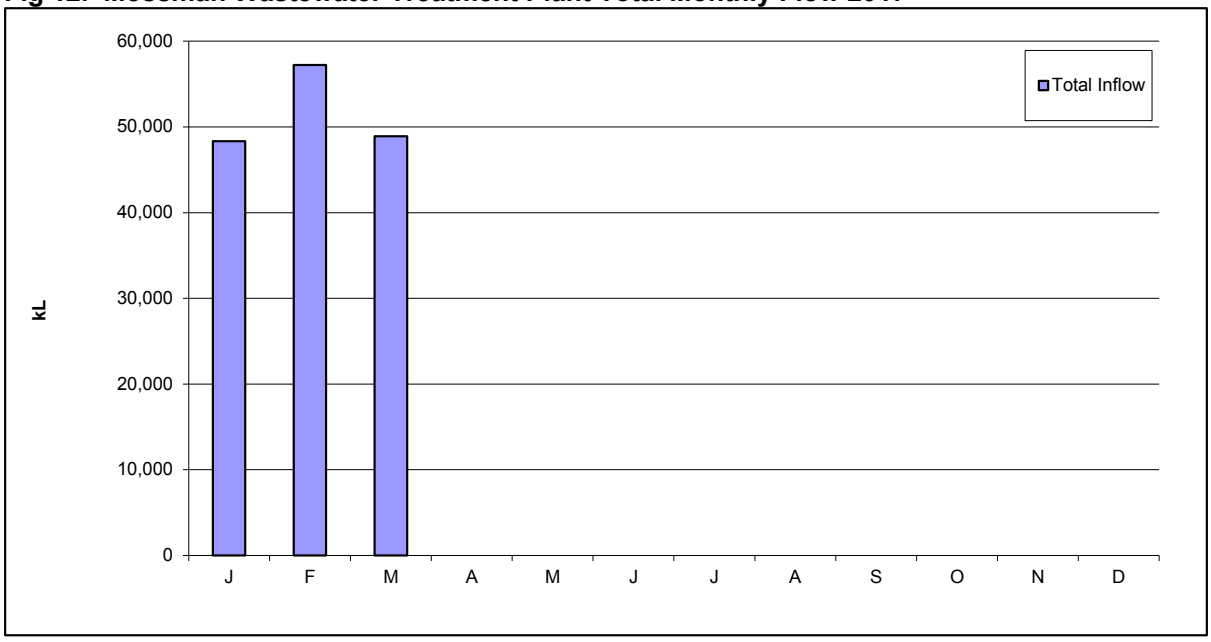


Fig 12. Mossman Wastewater Treatment Plant Total Monthly Flow 2017



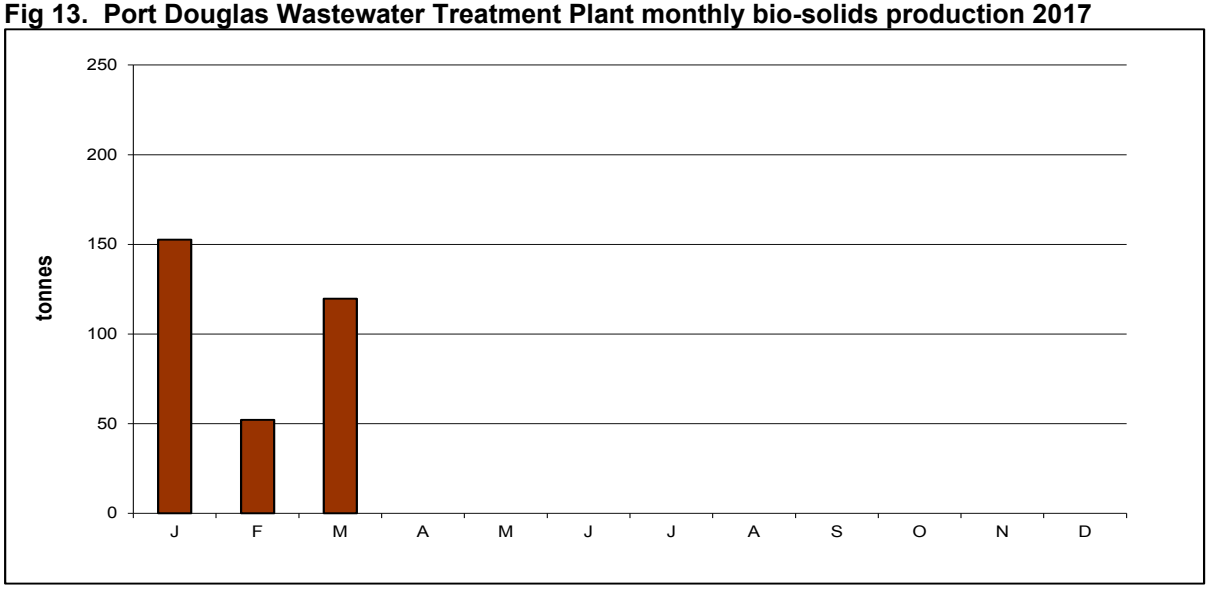
8. Bio-solids Production

Bio-solids were produced at the dewatering plants at Mossman Wastewater Treatment Plant (18% solids) and Port Douglas Wastewater Treatment Plant (12% 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, 324.48 tonnes of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet biosolids equates to 16.76 dry tonnes. The monthly bio-solids production trends can be seen in Fig 13.

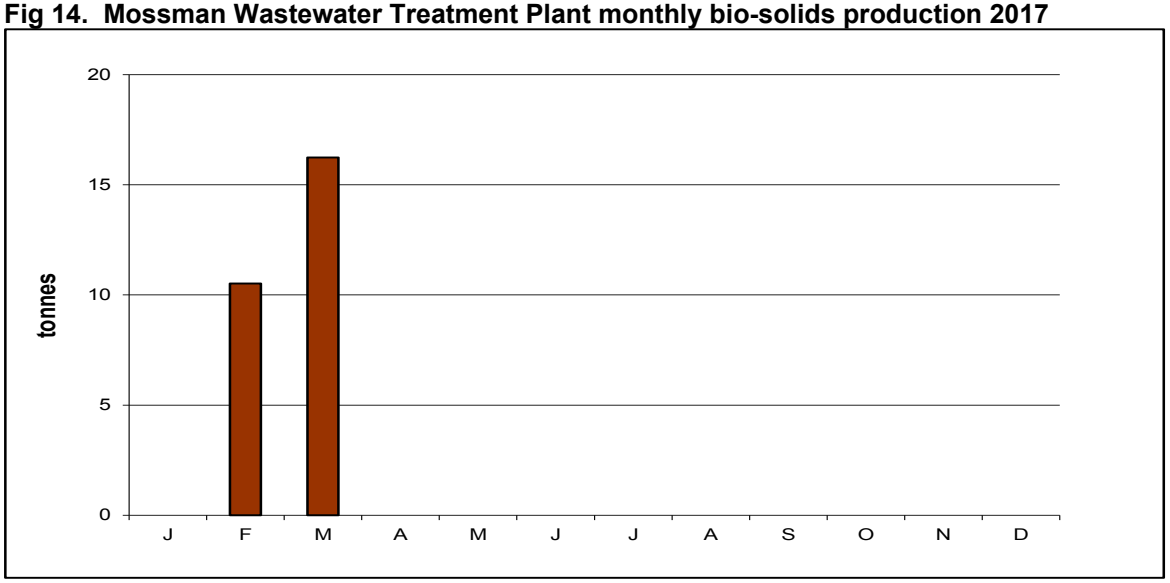
Fig 13. Port Douglas Wastewater Treatment Plant monthly bio-solids production 2017



Mossman Wastewater Treatment Plant

At Mossman Wastewater Treatment Plant, 27 tonnes of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet biosolids equates to 4 dry tonnes. The monthly bio-solids production trends can be seen in Fig 14.

Fig 14. Mossman Wastewater Treatment Plant monthly bio-solids production 2017



9. Effluent quality and compliance

During the reporting period a total number of 290 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.

During the reporting period all parameters tested 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.

Consultants are currently working on behalf of Council with DEHP to negotiate amended EA Licence conditions to ensure compliance for Mossman Wastewater Treatment Plant.

Port Douglas WWTP and Mossman WWTP have been receiving leachate from Killaloe for processing through the lagoon systems to meet Council's environmental licence requirements. The Port Douglas WWTP oxidation ditch refurbishment civil work has been completed. When the refurbishment was completed the oxidation ditch acts as a pre-treatment process for both Leachate and Belt Press filtrate prior to treatment in the SBR ensuring Council continues to meet its environmental requirements.

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 Fig 15, 16, 17 & 18

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

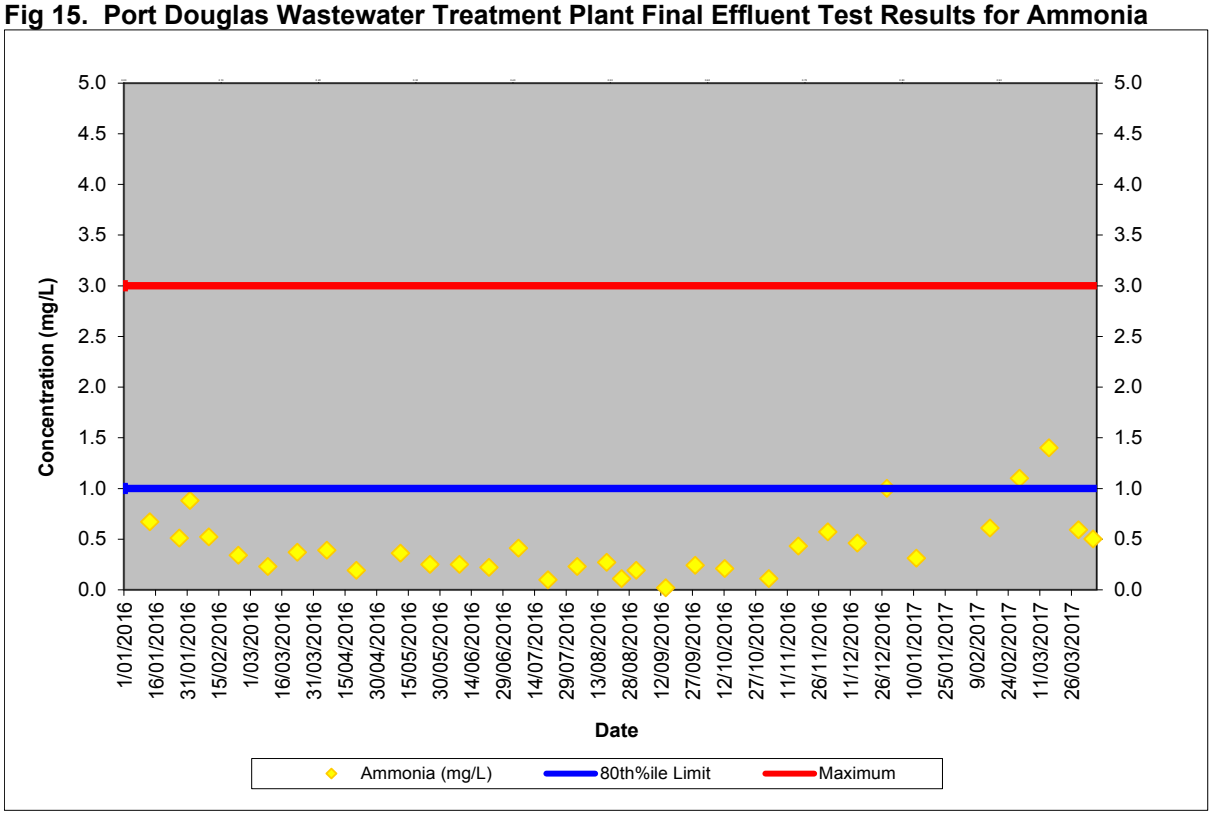


Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous

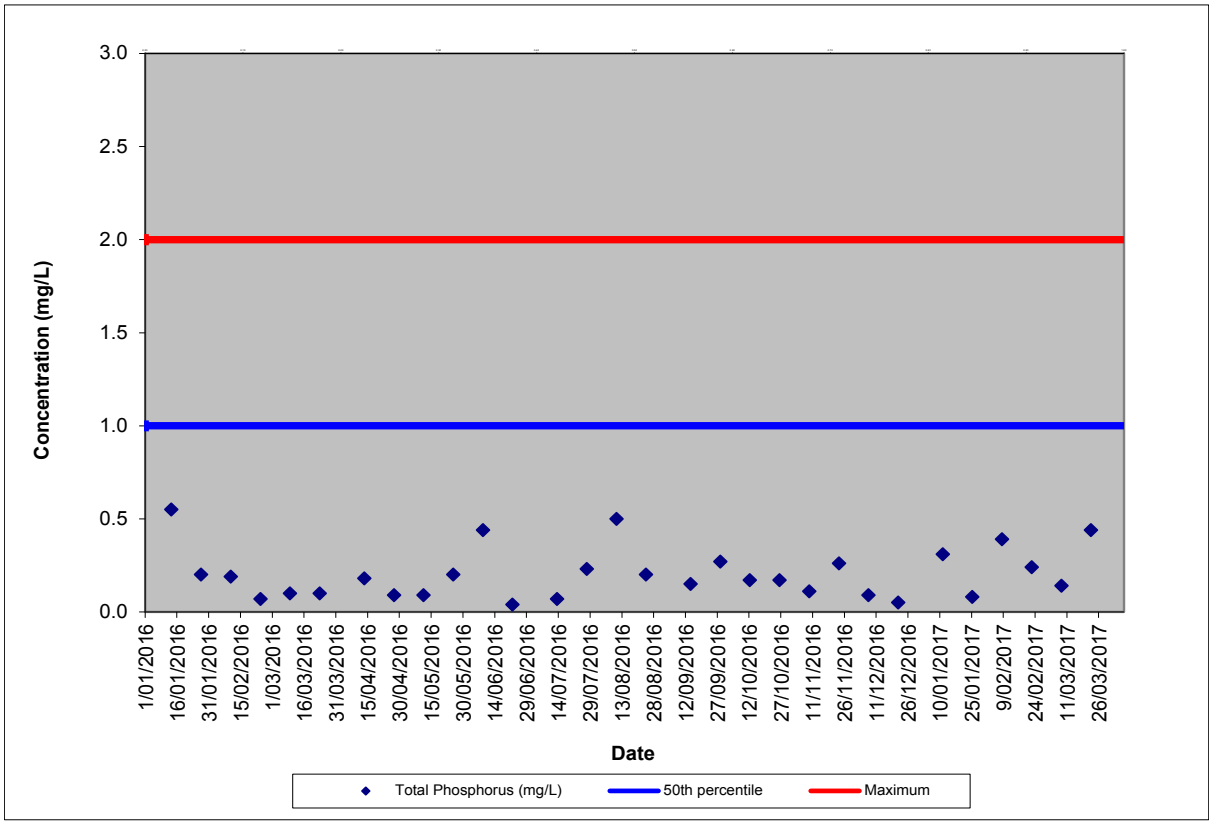


Fig 17. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids

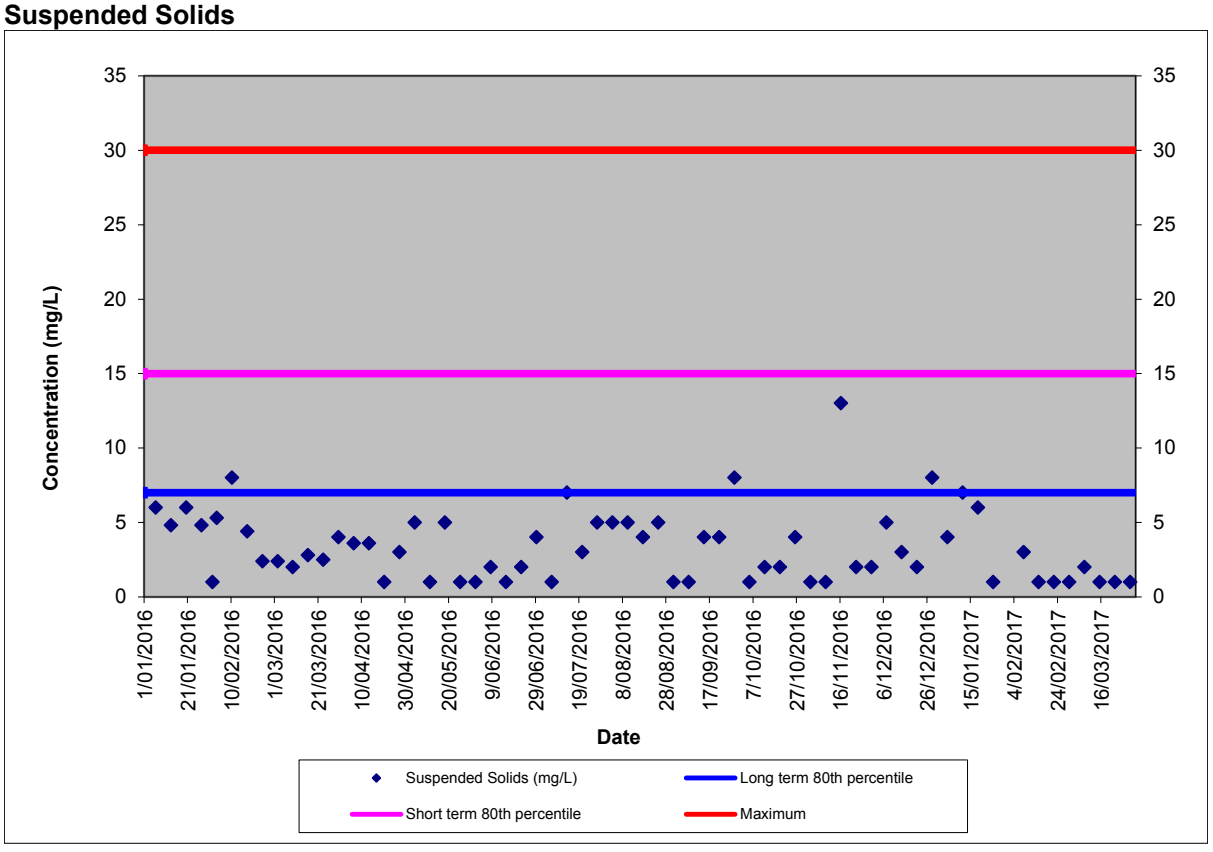
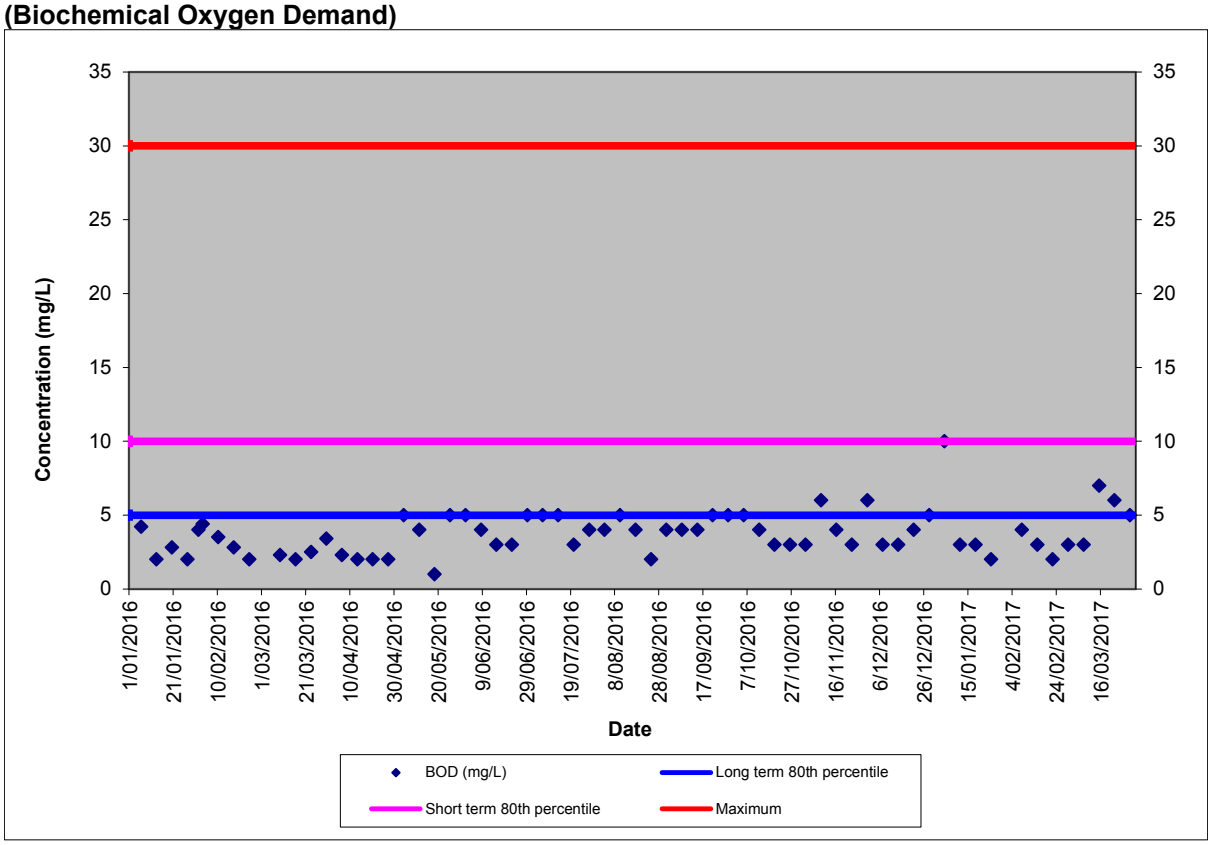


Fig. 18 Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)



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

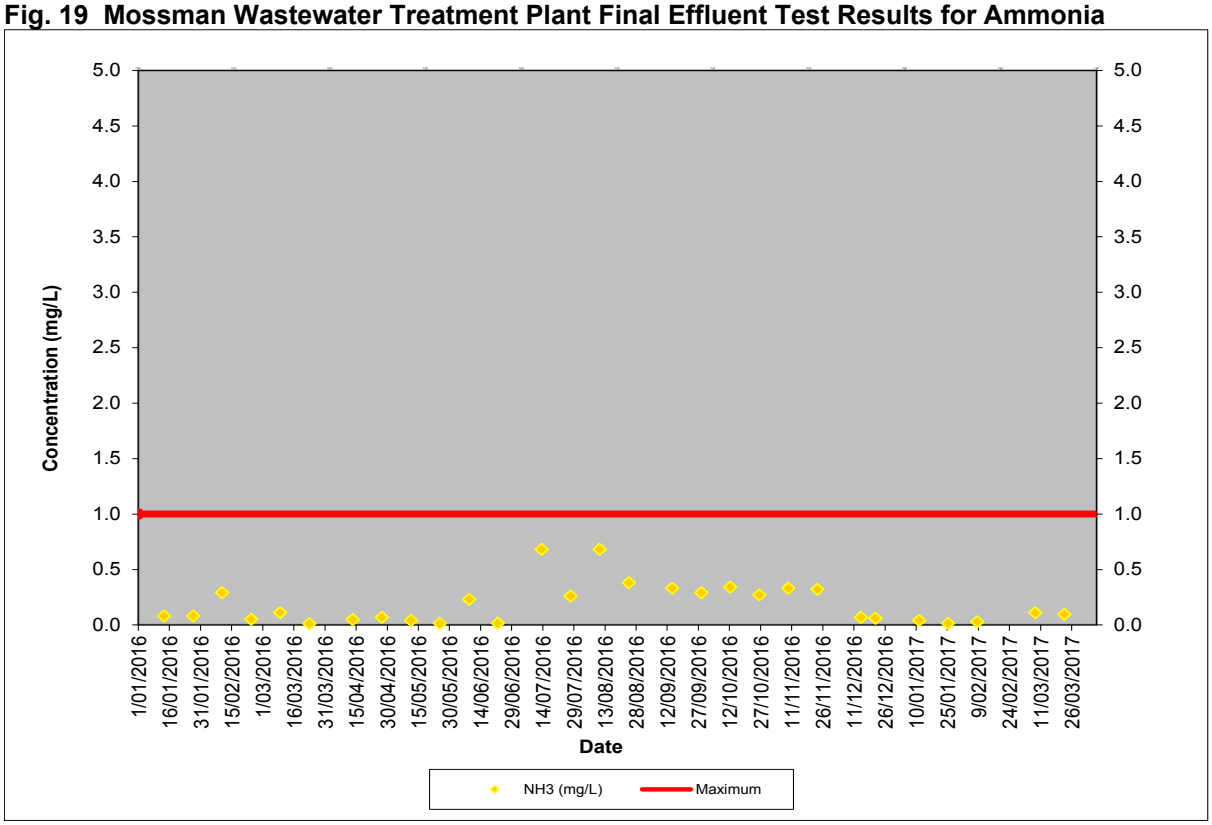


Fig. 20 Mossman WWTP Final Effluent Test Results for Total Phosphorous

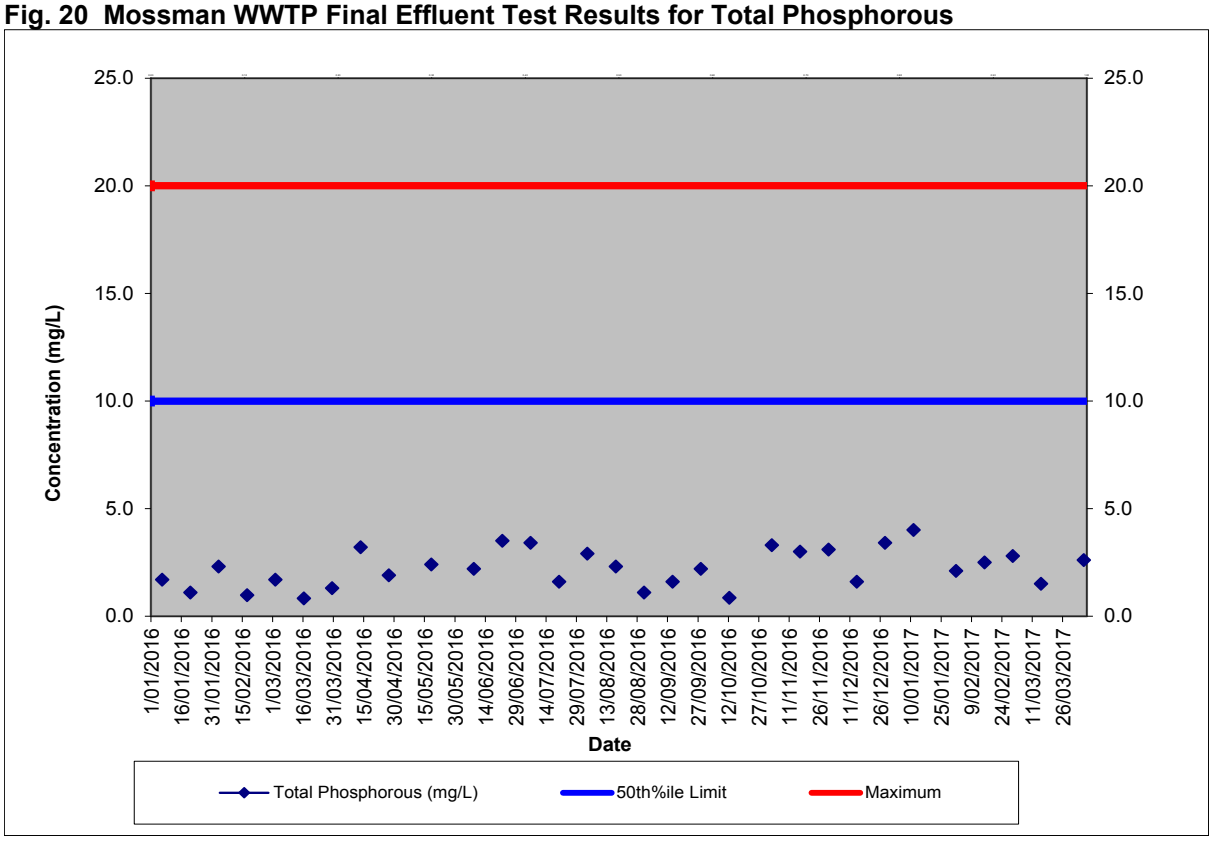


Fig. 21 Mossman WWTP Final Effluent Test Results for Total Suspended Solids

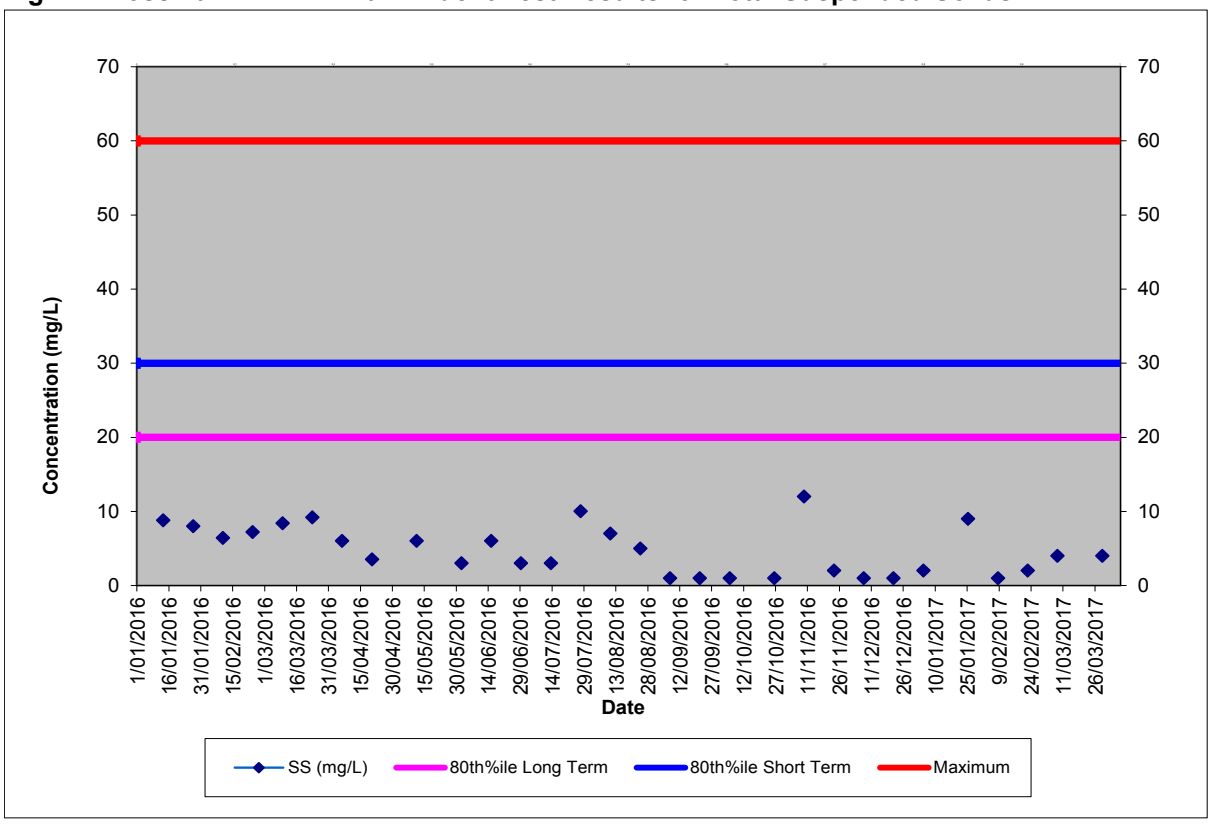


Fig. 22 Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)