

5.5. WATER AND WASTEWATER QUARTERLY REPORT FOR THE PERIOD ENDING 31 DECEMBER 2016

GENERAL MANAGER: Nicholas Wellwood, General Manager Operations
DEPARTMENT: Water and Wastewater

RECOMMENDATION

That Council resolves to receive and note the Quarterly Report of the Water and Wastewater Branch for the period ending 31 December 2016.

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 October to 31 December 2016.

Whilst the results are 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 VSD Low Lift Well Control at the Port Douglas Wastewater Treatment Plant, and replacement of Digester membranes and safety lids, pump replacements at various pump stations, scour repairs at the Daintree Reservoir, and a walkway bridge and stairs that were installed at the Daintree intake access area.

Council staff attended a meeting in Cairns with Department of Environment and Heritage Protection to discuss available options to achieve full compliance at the Mossman Wastewater Treatment Plant and additional Mossman Water Treatment Plant matters. Further discussions are being carried out on these issues as an outcome of the meeting actions.

BACKGROUND

This report is the second 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 and monthly 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 2016-2017 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 December 2016
[5.5.1]

Water and Wastewater Quarterly Report

1 October 2016 - 31 December 2016

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. The Daintree intake access area had stairs and a walkway bridge installed to allow for safe entry. Cert III water management training continued for four members of the Water Team.

Table 1. Water Reticulation Services

Douglas Shire Reticulation (all schemes)	
Settlement Meter Reads	108
New Water Services Connections	17
Service Repairs	114
Water Mains Repairs	7
Water Quality Complaints	1
Flushing Events: Mossman/Port Douglas/ Cooya/ Newell	5
Flushing Events: Whyanbeel/Wonga	2
Flushing Events: Daintree/ De Meio	1

Table 2. Water Complaints

Address	CRM No & Date	Nature of water complaint	How it was resolved	Response Time
316R Mowbray River Rd Mowbray	36694 02/11/16	Water reported to have white discolouration	Line flushed until clear (issue caused by main break)	30 mins

2. Water schemes and potable water consumption

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

Raw Water quality was good in all intakes averaging below 1.0 NTU except for storm turbidity events.

Dry hot conditions prevailed at the start of the reporting period and intake levels dropped to critical levels, triggering a Level 1 water restriction to be introduced on 3 November 2016 to assist in reducing consumption and in managing supply.

In the latter part of the reporting period, heavy rain squalls continued with the heavier 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 intake levels varied considerably from very low in the dryer periods, to high during periods of flooding. Consumption from all water schemes increased to very high levels in the latter part of the reporting period, resulting in water restrictions being elevated to Level 2 on 8 December 2016. The water restrictions assisted in stabilising water supply to consumers, and enabled the water plants to meet demand. Reduction in demand occurred quickly as a response and consumption fell to within acceptable parameters. Demand did increase over the Christmas holiday period however this continued to be within operational acceptability.

Mossman/Port Douglas Scheme

Mossman Water Treatment Plant was operating at capacity in order to meet demand due to low intake levels, whilst ensuring licence condition limits were adhered to. Level 2 water restrictions ensured consumer demand reduced and assisted in plant operations being maintained within licence requirements.

Maintenance works undertaken included on-going cartridge repairs to ensure compliance with UF rack integrity test limits, and all UF racks were operational.

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 140L/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 October to December 2016

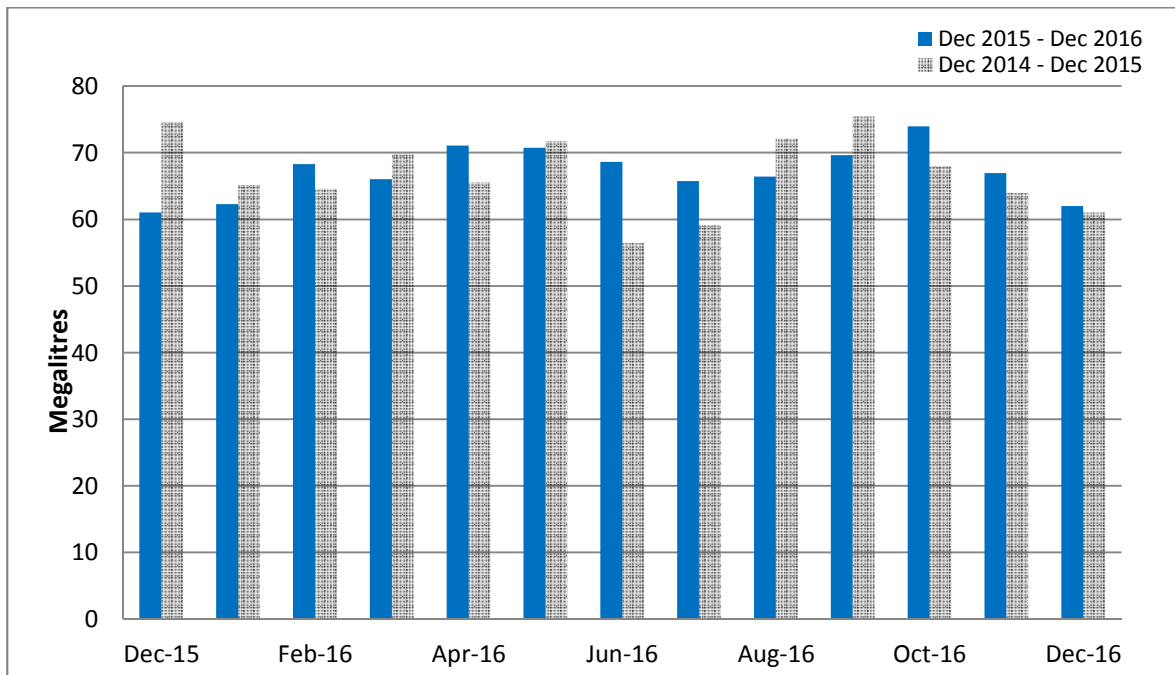


Mossman Water Treatment Plant was operating at demand capacity. Current trends indicate decreasing consumption typical of water restrictions and seasonal trends.

Mossman Water Supply

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

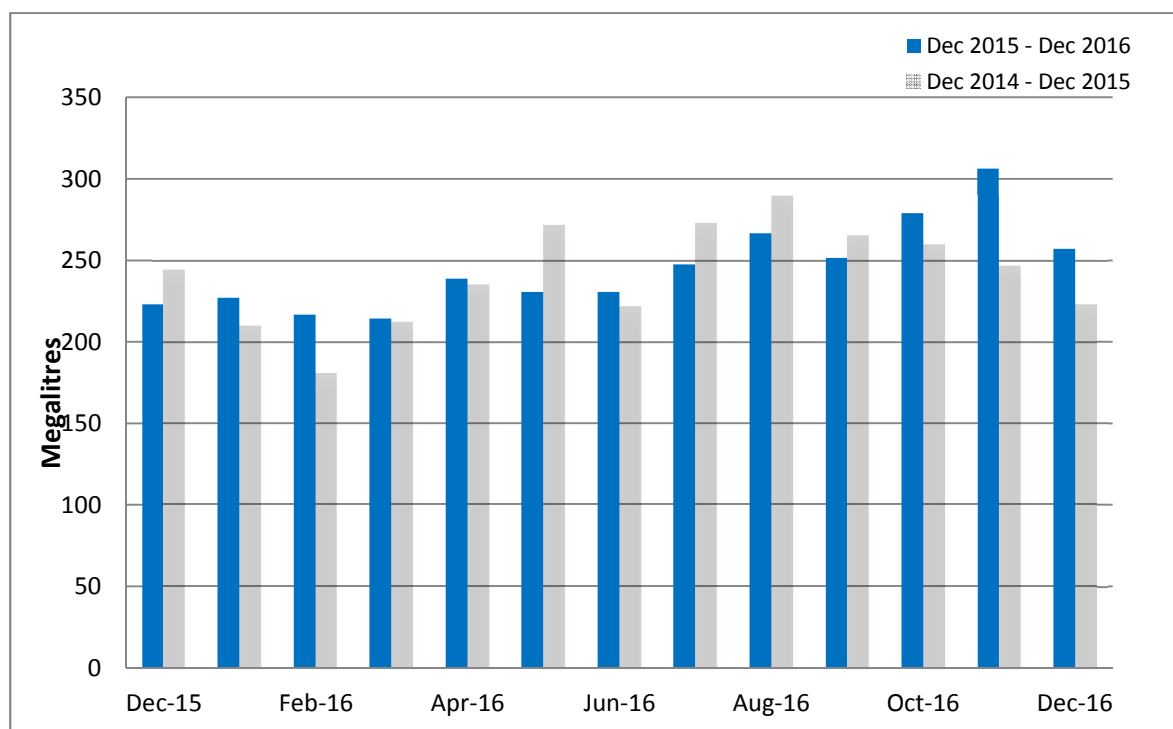
Fig 2. Mossman Scheme Monthly Consumption Figures



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 demand during the report period. Intake levels at Little Falls Creek dropped and consumption for this scheme increased substantially, resulting in Level 2 water restrictions being introduced. The elevated water restriction reduced demand which allowed for the recovery of the treated water reservoir, and for plant production to be reduced to sustainable levels.

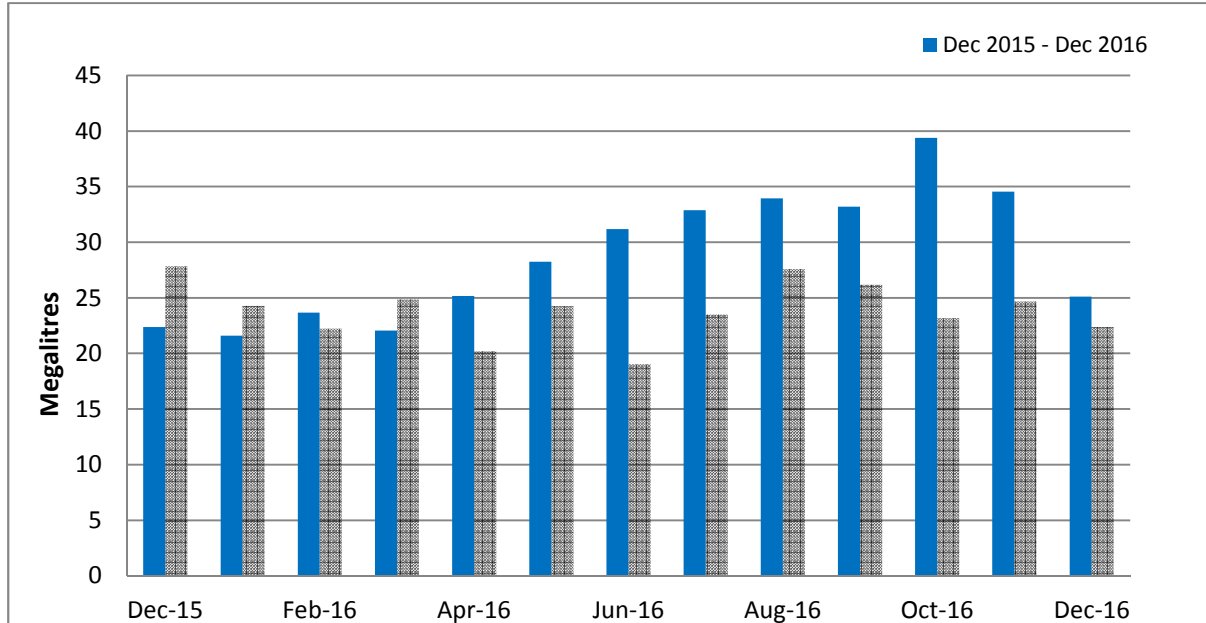
Maintenance works included cartridge repairs to ensure compliance with UF rack integrity test limits, and all UF racks were operational. Cartridge replacement of racks in Whyanbeel will soon be required to achieve integrity of the treatment system. The UV disinfection system was enabled to provide additional assurance in relation to water quality compliance

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.

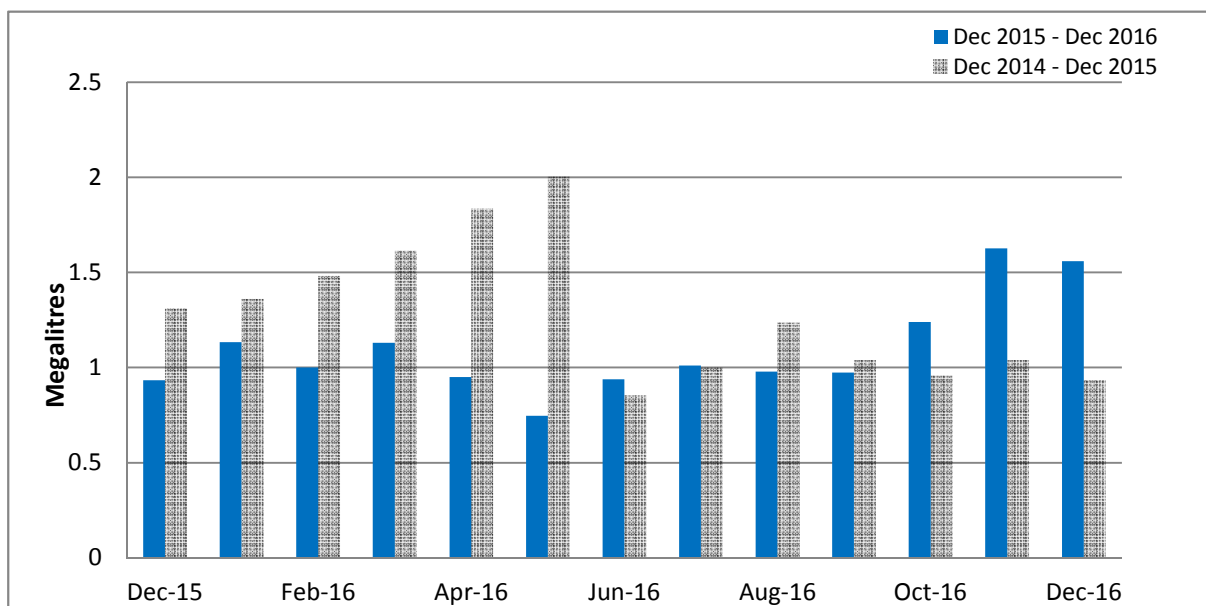
Consumption for this scheme increased substantially, resulting in Level 2 water restrictions being introduced. The restriction resulted in reduced demand which allowed for the recovery of the treated water reservoir and for plant production to be reduced to sustainable levels.

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

The Water and Wastewater Branch successfully fulfilled annual regulatory reporting and submitted a Drinking Water Quality Management Plan (DWQMP) Annual Report to the Water Supply Regulator, DEWS (Department of Energy and Water Supply) during December 2016.

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 October to 31 December 2016, a total of 324 treated and 3 raw water samples were taken in the 3 water supply schemes. A total of 246 samples were tested in the Douglas Water Laboratory and 78 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 October to December 2016.

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	<i>E.coli</i> CFU/100ml	Heterotrophic 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
Oct-16	7.70	22.1	9	1.00	1.07	<1	1	<1
Nov-16	7.67	23.7	9	0.89	0.97	<1	<1	<1
Dec-16	7.63	24.4	12.5	0.84	1.02	<1	<1	<1

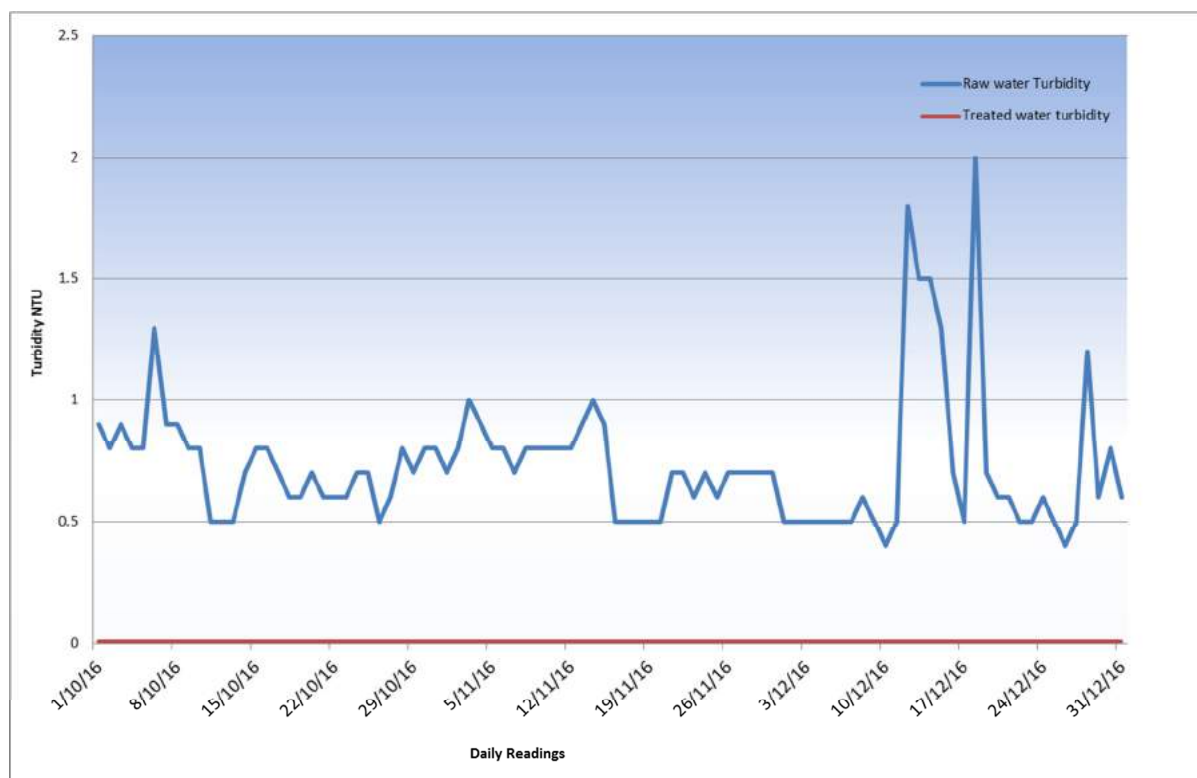
Table 4. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.

Month	pH	Temp °C	Total Alkalinity mg CaCO ₃ /L	Free chlorine mg/L	Total chlorine mg/L	<i>E.coli</i> CFU/100ml	Heterotrophic 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
Oct-16	7.40	23.2	11.5	0.97	1.10	<1	4	<1
Nov-16	7.37	25.1	7.5	0.91	0.99	<1	2	<1
Dec-16	7.41	25.1	13.5	0.93	1.01	<1	15	<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	<i>E.coli</i> 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
Oct-16	7.71	24.8	0.72	0.80	<1	1	<1
Nov-16	7.69	26.3	0.63	0.71	<1	1	<1
Dec-16	7.80	27.0	0.52	0.59	<1	2	<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., Table 7. and Table 8. for treated water at the Whyanbeel Treatment Plant, Whyanbeel 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 October to December 2016.

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	<i>E.coli</i> 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
Oct-16	7.19	21.6	<5	0.95	1.04	<1	<1	<1
Nov-16	7.43	23.2	9	0.94	1.05	<1	<1	<1
Dec-16	7.43	24.4	6	0.90	1.00	<1	<1	<1

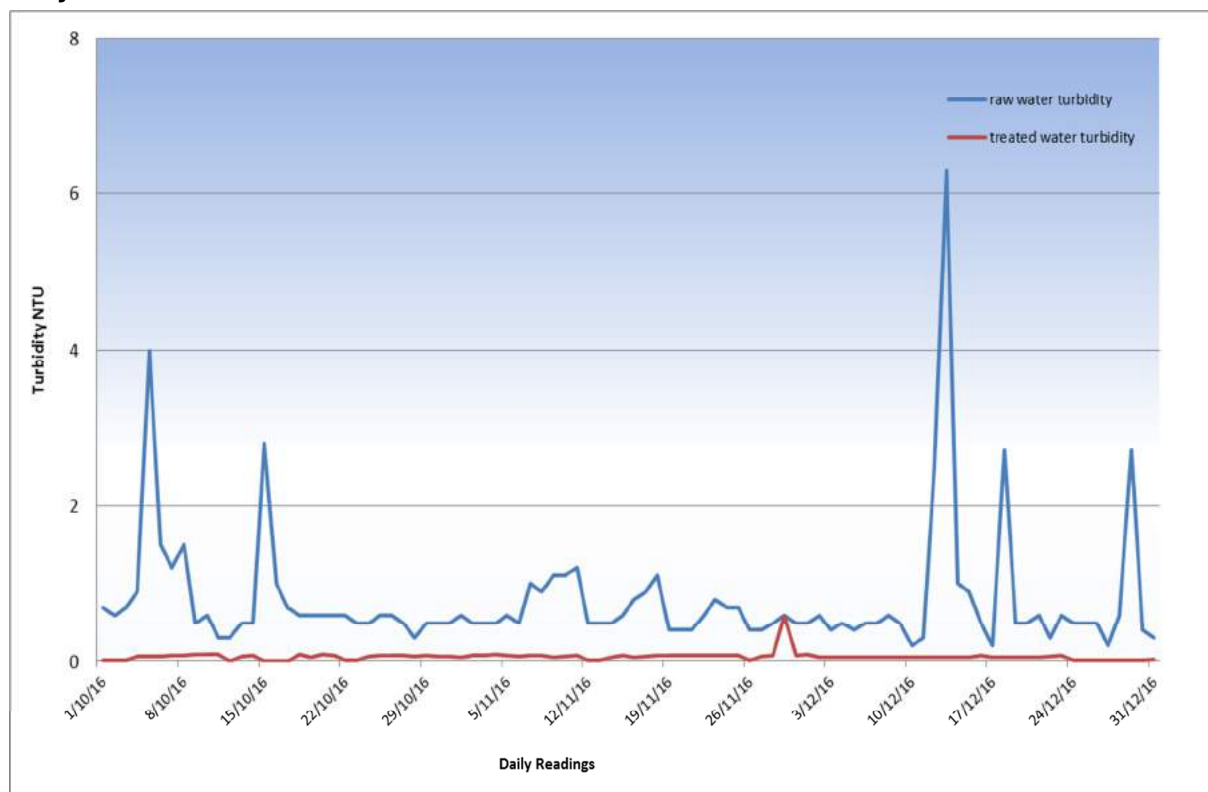
Table 7. Average monthly values for key operational and compliance parameters in the Whyanbeel Reservoir.

Month	pH	Temp °C	Total Alkalinity mg CaCO ₃ /L	Free chlorine mg/L	Total chlorine mg/L	<i>E.coli</i> 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
Oct-16	7.16	24.3	10	0.85	0.93	<1	3	<1
Nov-16	7.42	25.9	13	1.00	1.10	<1	1	<1
Dec-16	7.56	26.7	9	0.99	1.06	<1	3	<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	<i>E.coli</i> 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
Oct-16	7.56	24.6	0.60	0.68	<1	1	<1
Nov-16	7.65	25.9	0.80	0.88	<1	1	<1
Dec-16	7.79	26.6	0.69	0.75	<1	3	<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 9. and Table 10. 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 October to December 2016.

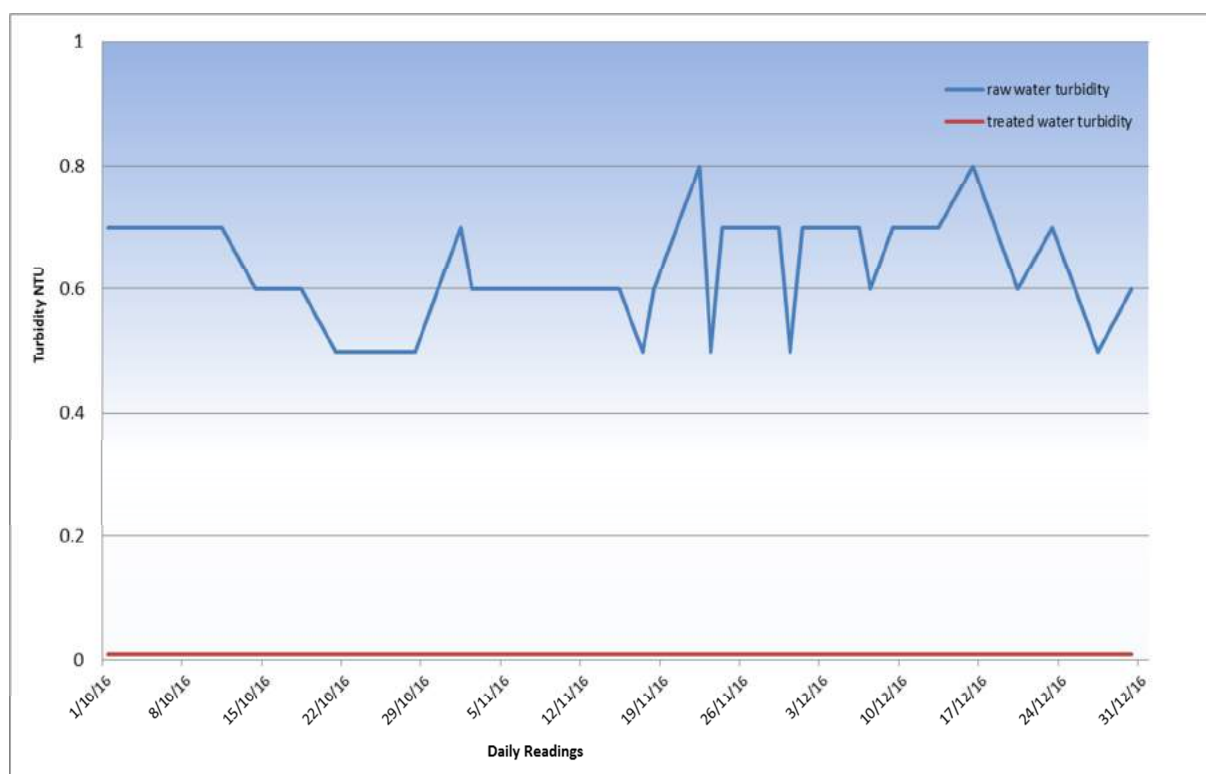
Table 9. Average monthly values for key operational and compliance parameters in treated water at Daintree Treatment Plant.

Month	pH	Temp °C	Total Alkalinity mg CaCO ₃ /L	Free chlorine mg/L	Total chlorine mg/L	<i>E.coli</i> 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
Oct-16	7.41	23.1	26	0.91	0.97	<1	1	<1
Nov-16	7.45	25.5	32	0.99	1.10	<1	1	<1
Dec-16	7.38	25.5	26	0.99	1.07	<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	<i>E.coli</i> 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
Oct-16	7.55	23.2	0.69	0.75	<1	3	<1
Nov-16	7.46	25.3	0.88	0.95	<1	<1	<1
Dec-16	7.63	26.7	0.73	0.81	<1	1	<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. Soil testing was undertaken in readiness for the new Clarifier project at Mossman Wastewater Treatment Plant, and the sewer relining program continued with a further 2,645 metres completed throughout Port Douglas.

Due to two collapsed sewers under private infrastructure and a creek crossing, an alternative process had to be conducted by Council’s contractor in order to replace the burst pipes without detrimentally impacting on the property and creek. The process involved pulling a

replacement pipe through the existing pipework with the assistance of a self-levelling pneumatic head and winch. Works were completed successfully with no adverse impact on the existing private infrastructure and creek.

Electrical storms during this period caused power outages at some pump stations, and some electrical faults to pumps and control equipment.

Various Capital Works items were completed during the reporting period. At the PDWWTP the VSD Low Lift Well Control was installed; Digester membranes and pumps were replaced, and JDP manholes were resealed. At the MWWTP various pumps were replaced at pump stations, and safety lids were installed.

Mossman and Port Douglas Wastewater Treatment Plants were compliant for the reporting period, and 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

5. 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 2,845 kL/day. Tanker truck contractors delivered 538 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 73% of the treated effluent was pumped to two resorts and the remaining discharged into the Dickson Inlet. The Sheraton Mirage received 96,166 kL and Reef Links received 93,478 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 218.5 mm. On 11 December 2016, the highest rainfall on a day was recorded as 24 mm. Daily SBR flows and total monthly flows for 2016 are presented in Fig 9 and 10 respectively.

Fig 9. Port Douglas SBR Daily Flow

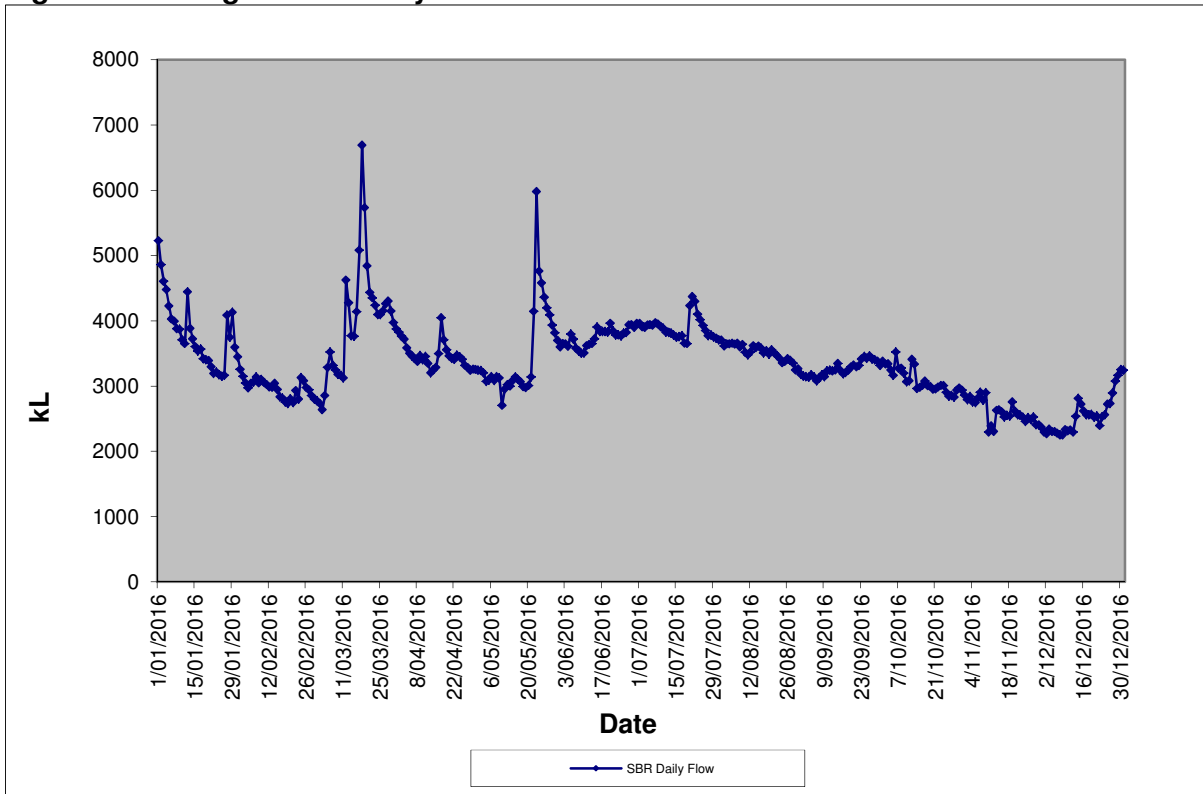
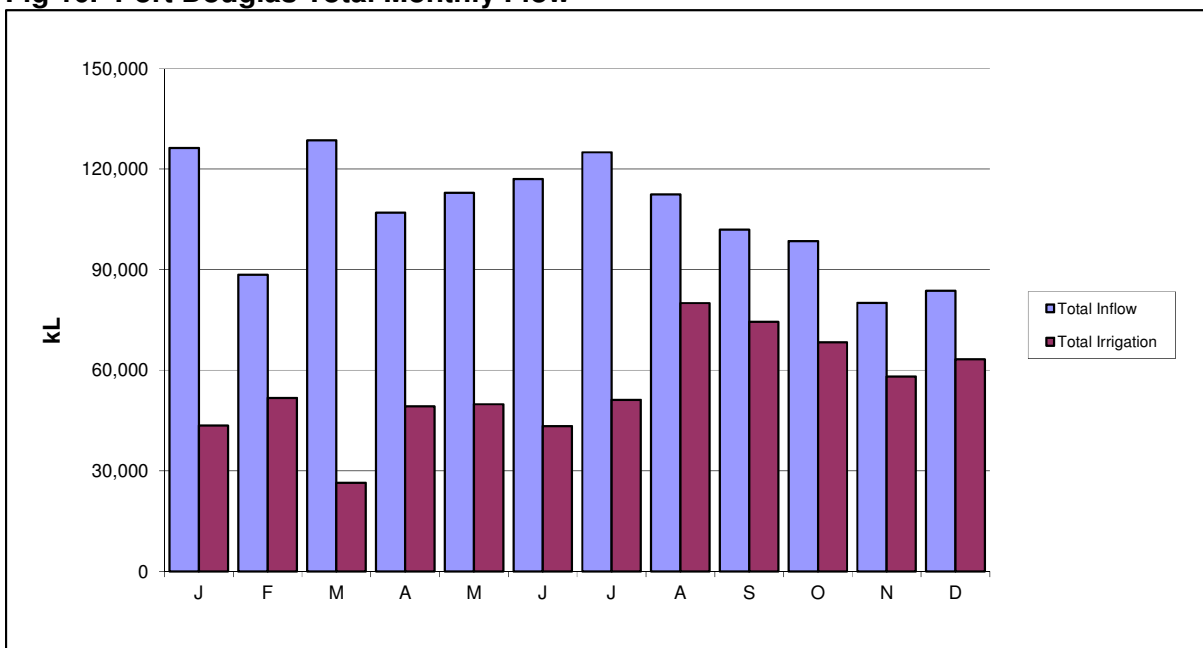


Fig 10. Port Douglas Total Monthly Flow



Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 71,131kL during the reporting period. The average daily flow was 740 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River. A total of 394 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 41.5 mm on 5 October 2016.

Daily flows from the Mossman Wastewater Treatment Plant and total monthly flows for 2016 are presented in Fig 11 and 12 respectively.

Fig 11. Mossman Wastewater Treatment Plant Daily Flow

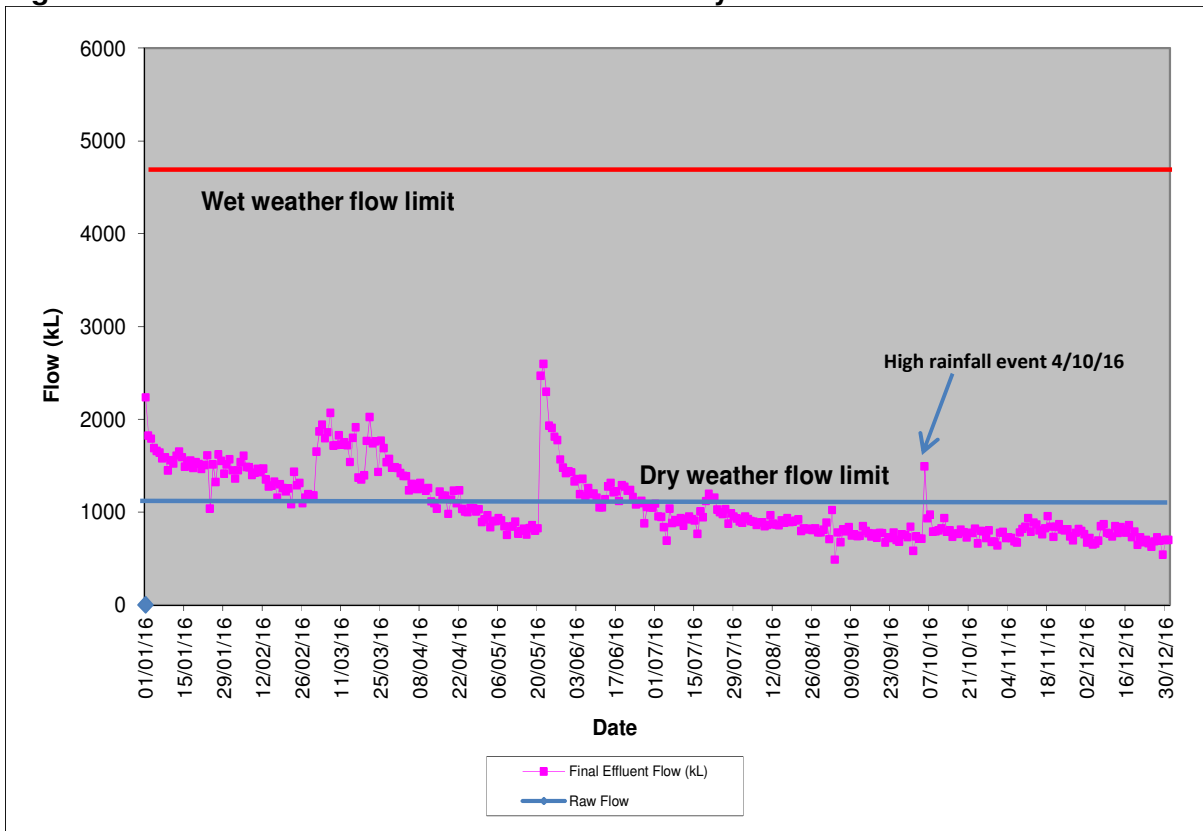
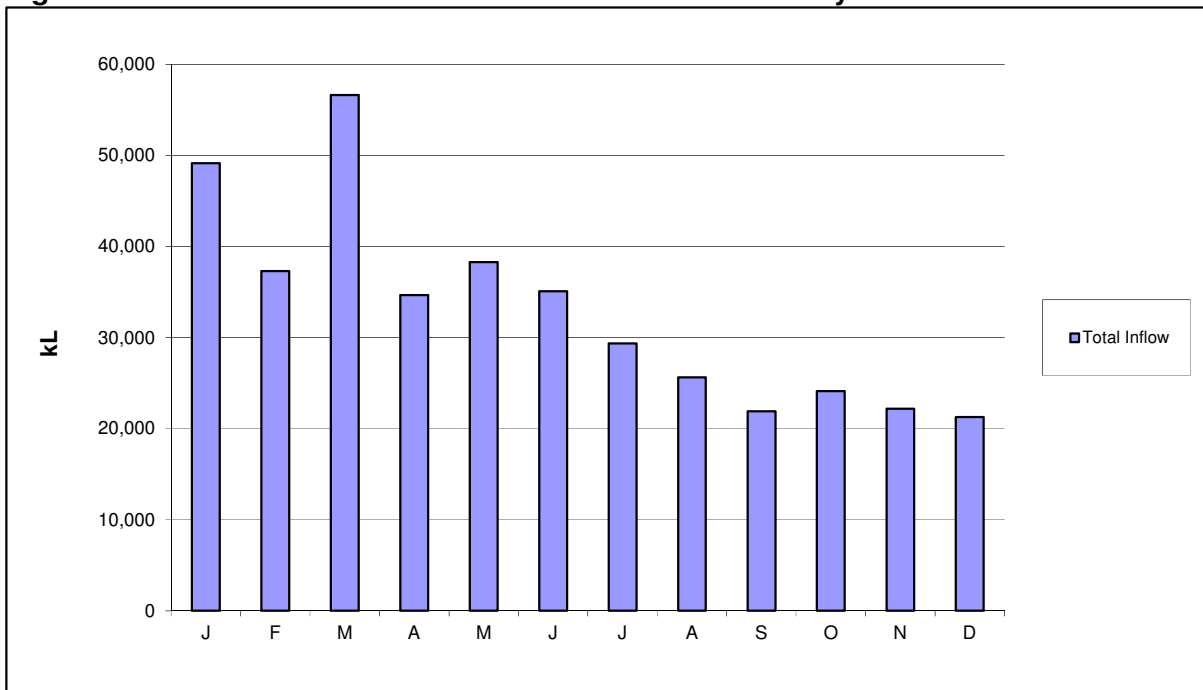


Fig 12. Mossman Wastewater Treatment Plant Total Monthly Flow



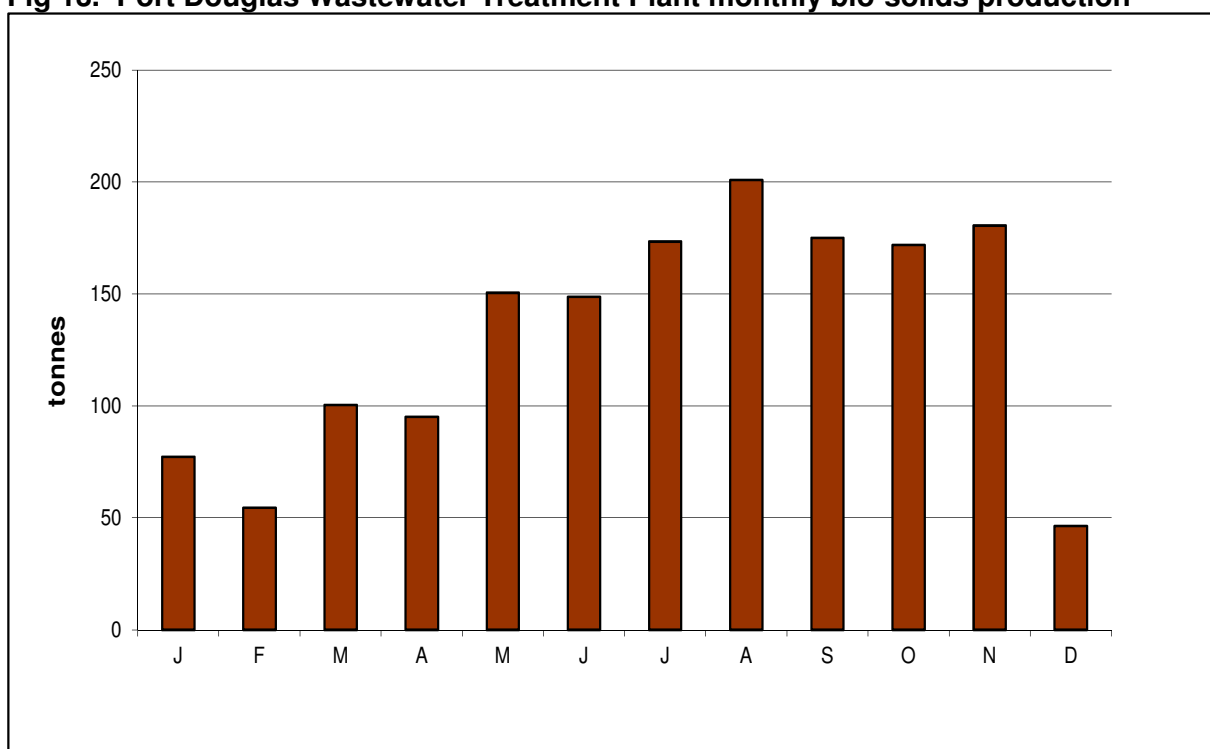
6. Bio-solids Production

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

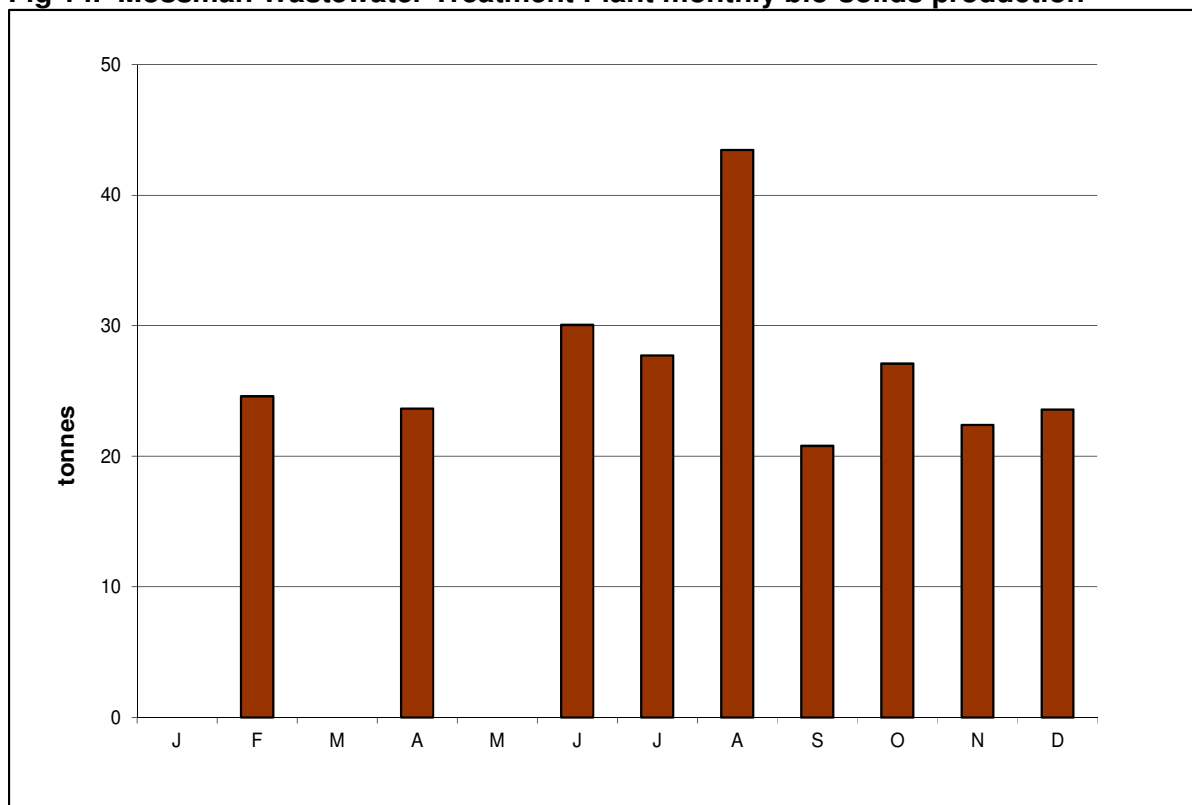
At Port Douglas Wastewater Treatment Plant, 398.7 tonnes of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet biosolids equates to 55.8 dry tonnes. The monthly bio-solids production trends can be seen in Fig 13.

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



Mossman Wastewater Treatment Plant

At Mossman Wastewater Treatment Plant, 73 tonnes of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet biosolids equates to 10.2 dry tonnes. The monthly bio-solids production trends can be seen in Fig 14.

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

7. Effluent quality and compliance

During the reporting period a total number of 234 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 and short term 80th percentile 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. Port Douglas WWTP oxidation ditch refurbishment has commenced with preliminary work been undertaken on systems process design. Civil work has commenced with oxidation ditch refurbishment. When the refurbishment has been completed the oxidation ditch will act 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 & BOD₅) are shown in Fig 15, 16, 17 & 18

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

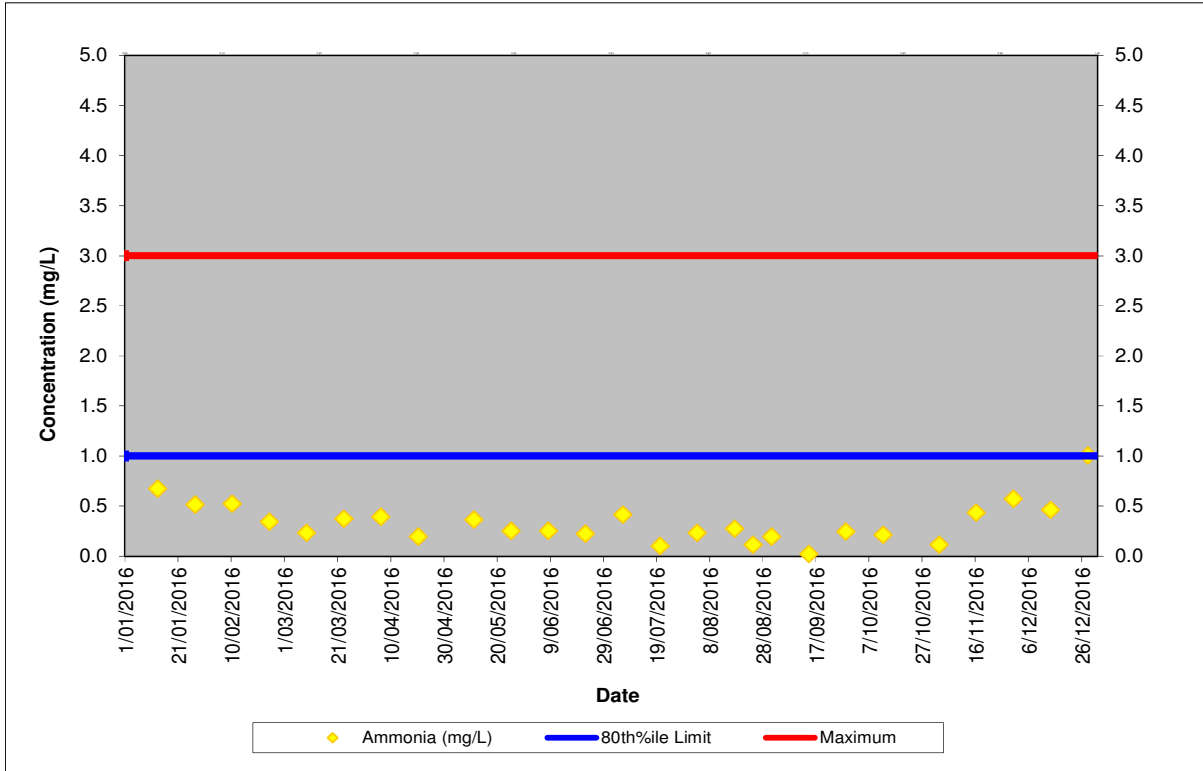


Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous

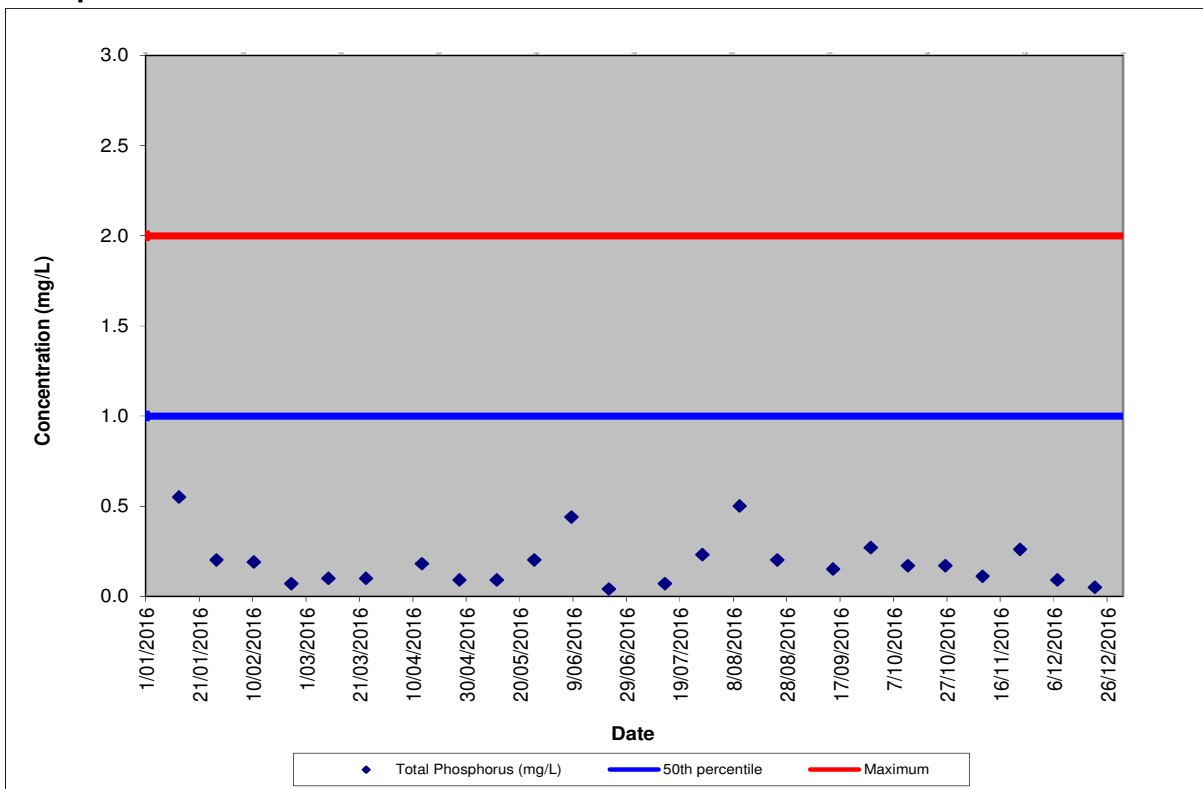


Fig 17. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids

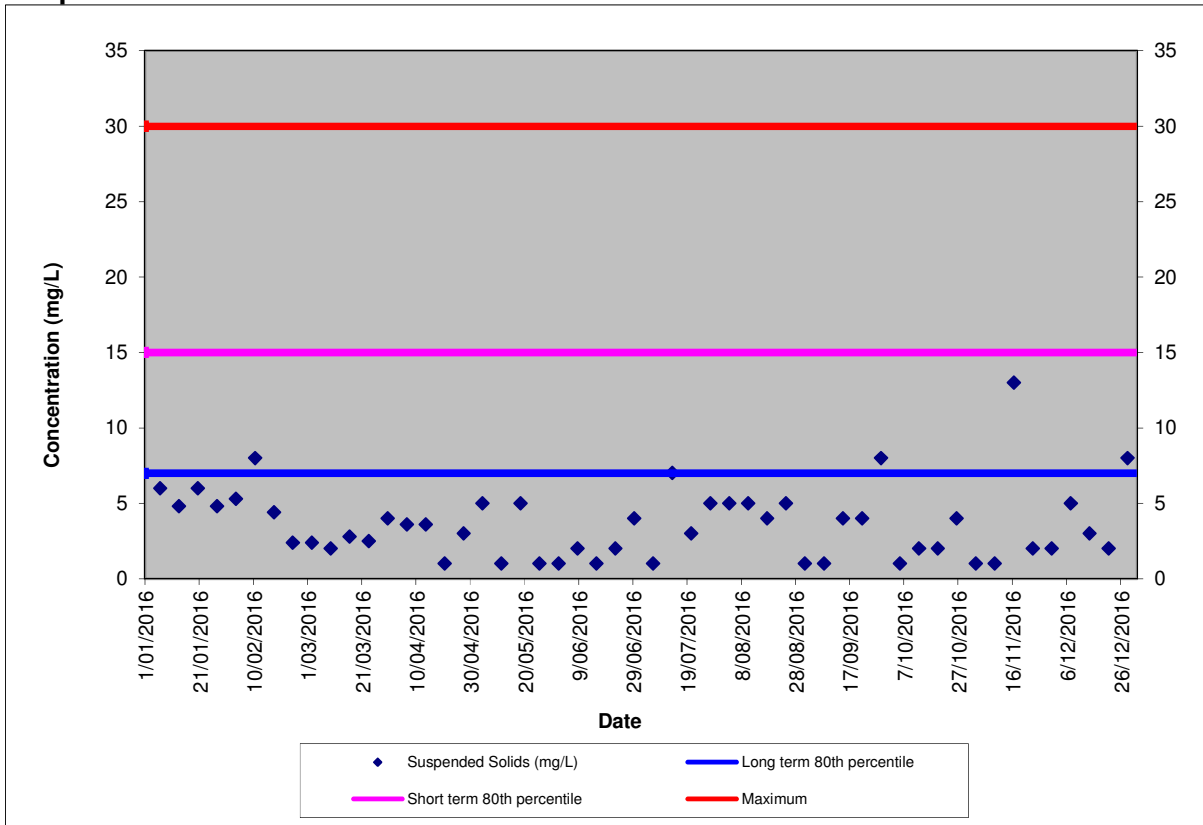
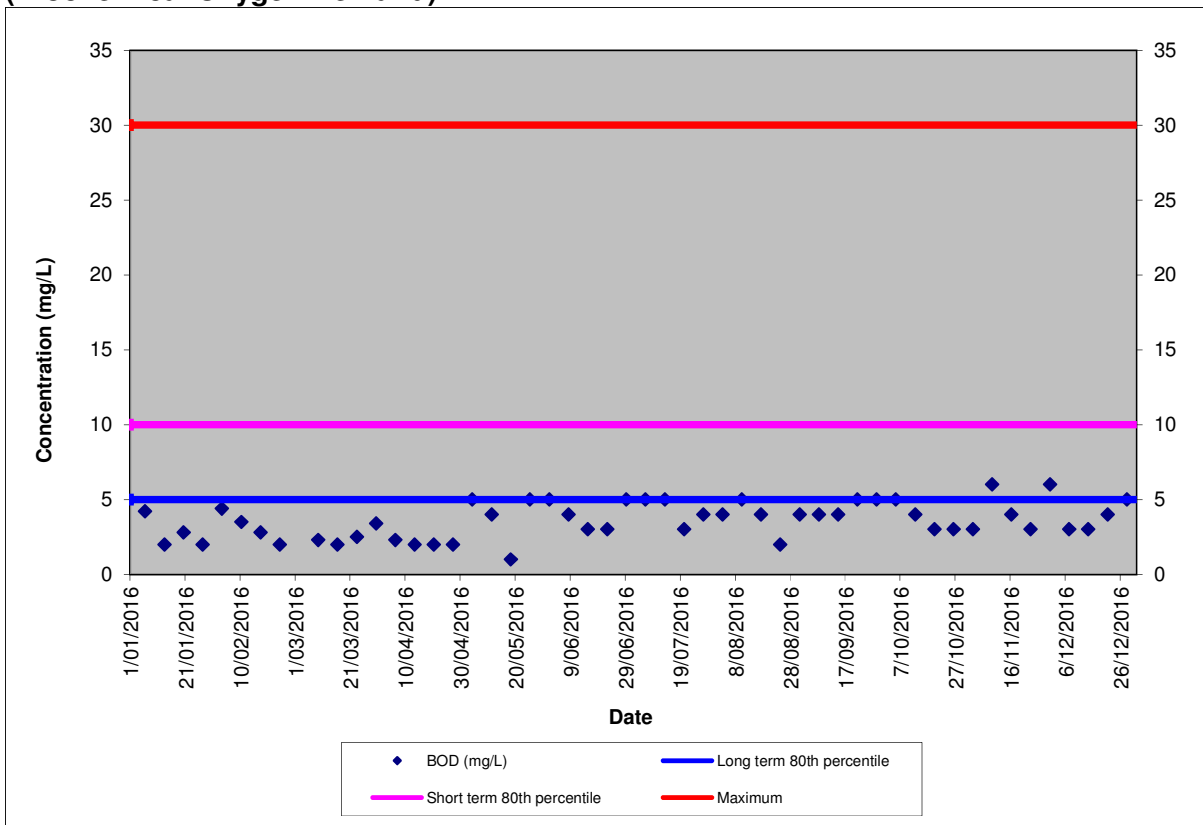


Fig 18 Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD₅ (Biochemical Oxygen Demand)



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

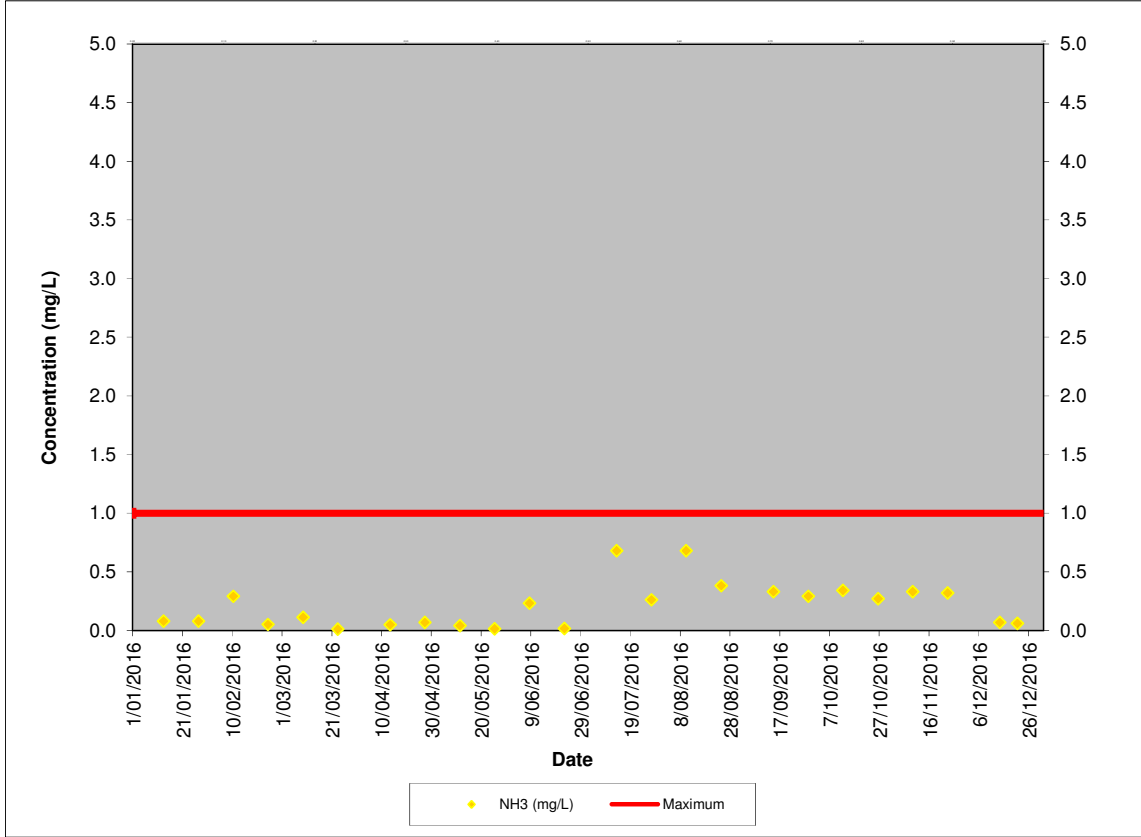


Fig. 20 Mossman WWTP Final Effluent Test Results for Total Phosphorous

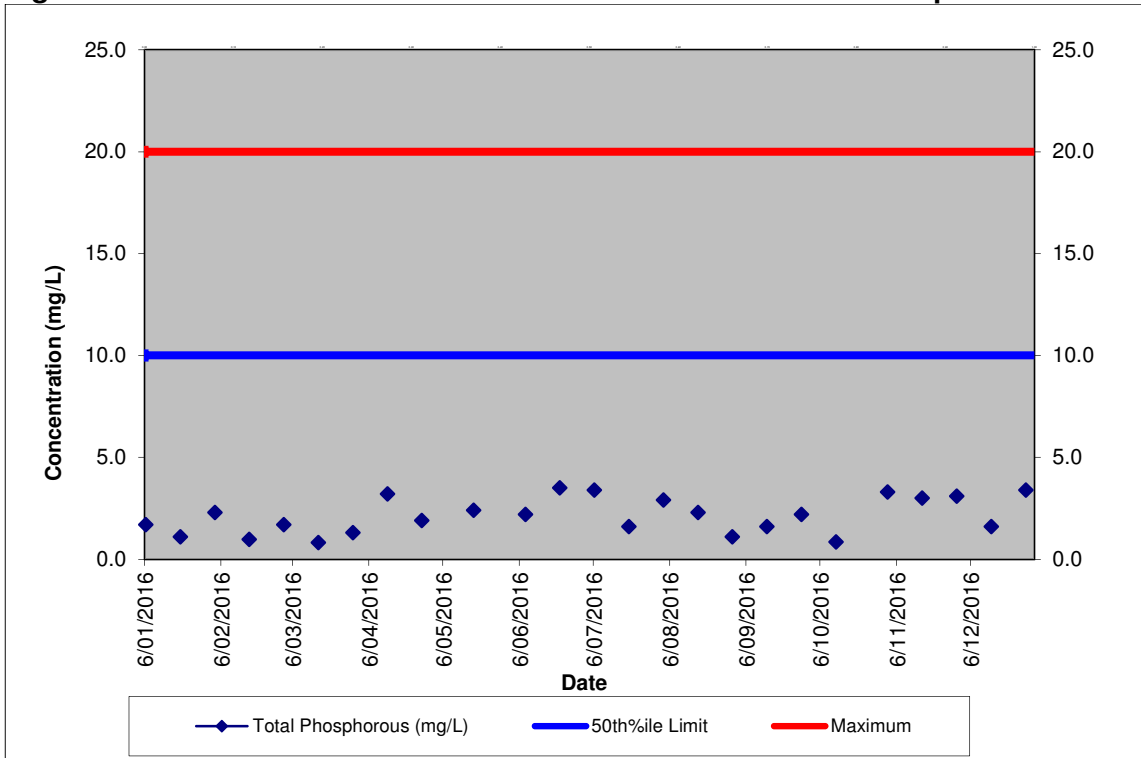


Fig. 21 Mossman WWTP Final Effluent Test Results for Total Suspended Solids

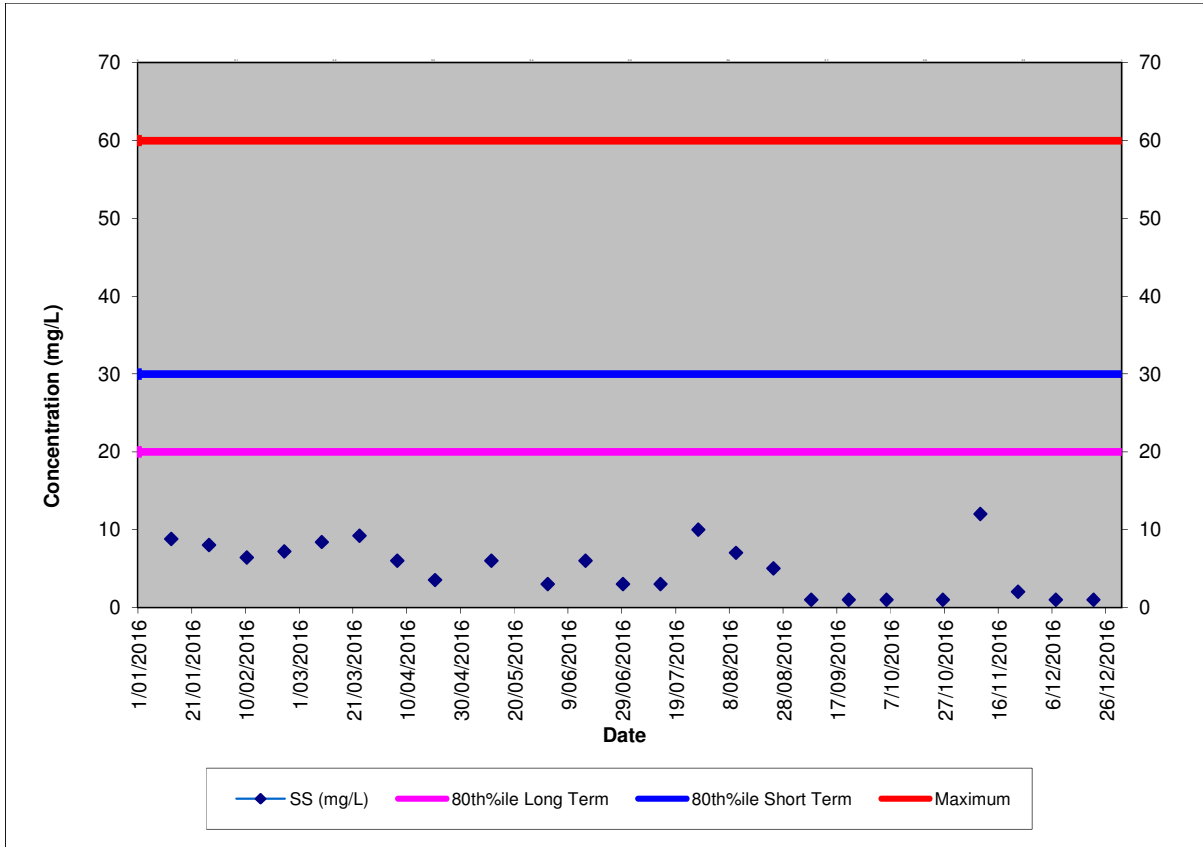


Fig. 22 Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD₅ (Biochemical Oxygen Demand)

