5.8. WATER AND WASTEWATER QUARTERLY REPORT FOR THE PERIOD 1 JULY 2016 TO 30 SEPTEMBER 2016

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 30 September 2016 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 July to 30 September 2016.

Whilst the results are generally positive the areas for improvement have been noted and will be the focus of the branch over the next quarter.

BACKGROUND

This report is the first 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.

Council staff are continuing coordination and actions with the Regulator regarding improvements and changes to the Mossman Wastewater Treatment Plant which has not met requirements for many years to meet the "dry weather flow release limits". A consultant has been engaged to assist with negotiations between the Department of Environment and Heritage Protection and Council to find alternative means to satisfy release limits, including an off-set program and recycled water production.

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 Operational and Capital 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
5.3.2 - Recruit and retain skilled staff who are committed to quality customer service.
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.
3.2.2 - Implement the approved 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:

Regulator Meeting the responsibilities associated with regulating activities through legislation or local law.

CONSULTATION

Internal: Nil

External: Water and wastewater quality parameters are tested by an accredited laboratory and test results and service levels are required to be reported to the Department of Energy and Water Supply and the Department of Environment and Heritage Protection.

Community: Nil

ATTACHMENTS

1. Water and Wastewater Quarterly Report for the period ending 30 September 2016 **[5.8.1]**

Water and Wastewater Quarterly Report

1 July 2016 - 30 September 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 Operational and Capital 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 this quarter including intake maintenance and cleaning/flushing of dead end mains. Hydrant maintenance and painting of sluice valves have been continuing in all locations throughout the Shire.

A new ladder was also installed at the Craiglie Reservoir in accordance with Australian Standards.

The vacant Trainee Treatment Operator position was successfully filled internally and training commenced.

Table 1. Water Reticulation Services

Douglas Shire Reticulation (all schemes)	
Settlement Meter Reads	119
New Water Services Connections	14
Service Repairs	79
Water Mains Repairs	4
Water Quality Complaints	5
Flushing Events: Mossman/Port Douglas/ Cooya/ Newell	8
Flushing Events: Whyanbeel/Wonga	2
Flushing Events: Daintree/ De Meio	2

Table 2. Water Complaints

Address	CRM No & Date	Nature of water complaint	How it was resolved	Response Time
88R Warner St Cassowary	29619 08/07/16	Water reported to have a yellow colouration to it.	Line was flushed at the boundary and was clear.	30 mins
15 Oasis Dr Wonga Beach	31686 11/08/16	Water reported as black in colour.	Main was flushed to clear the problem. The problem had occurred due to a broken main (repaired).	20 mins
57 Bougainvillea St Cooya	33130 01/09/16	Water reported to have an orange colouration to it.	Line flushed at property boundary and was clear.	15 mins
Lot 6 Francis Rd Cassowary	33832 09/09/16	Water reported as black in colour.	Line flushed at property boundary and was clear.	30 mins
Lot 91 Bonnie Doon Rd Bonnie Doon	33876 12/09/16	White residue in water reported.	Main and meter flushed. Weekly flushing to occur.	1 hr 40 mins
22 Jirimandi Cl Wonga	34544 21/09/16	Cloudy water reported.	Water appeared clear, but meter flushed anyway.	4 hrs
277R Gorge Rd Mossman Gorge	34973	Water reportedly tasted terrible and was allegedly making the caller sick.	Water was sampled and tested. pH was ok, <1 E.coli and <1 Total Coliforms. It was established it was an internal problem at the property. Customer advised they will install a filter between the house and tank.	45 mins

2. Water schemes and potable water consumption

Raw Water quality for the period was good in all intakes averaging below 1.0 NTU.

Isolated rain periods have continued with some heavy falls causing localised flooding in the water plant intake creeks. There were a number of high raw water turbidity events as a result with subsequent impacts to plant operations.

All intakes for the period had good flows of water with adequate capacity to meet operational demands.

Consumption from all water schemes was on average for this time of year and has resulted in no demand management issues in this quarter.

The previous wet season delivered below average rainfall but there have been consistent showers and some heavy falls during the dry season in this quarter to help replenish the stream flows.

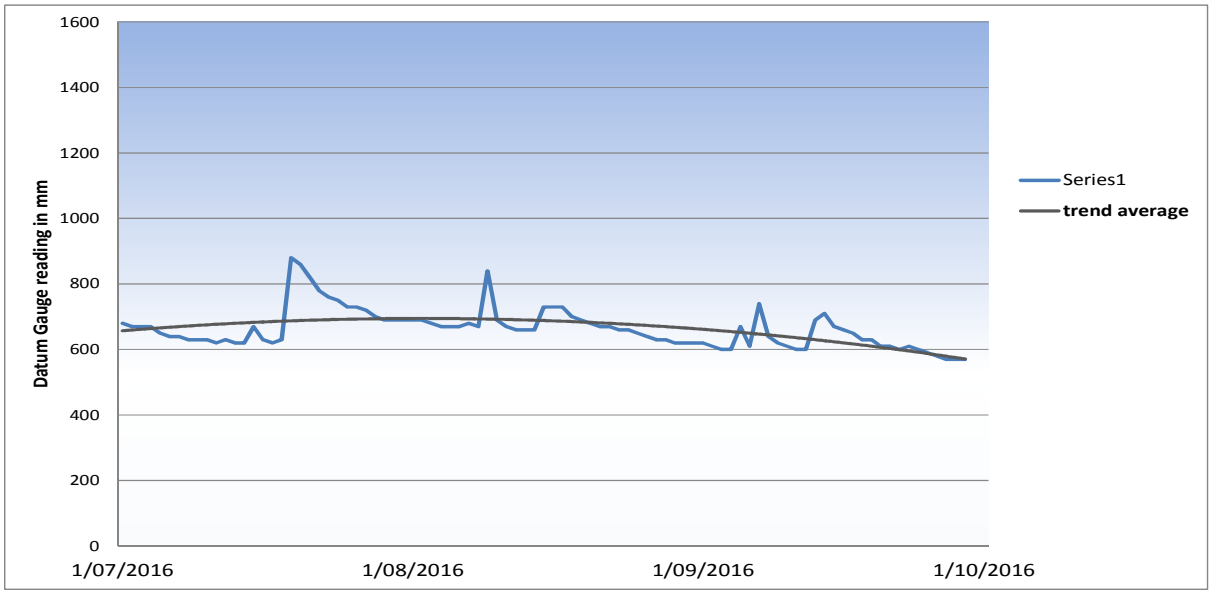
Mossman/Port Douglas Scheme

Rex Creek intake levels had stabilised during the period on average at 0.58 metres with consistent replenishing rains which are ensuring water supply levels remain stable.

Maximum instantaneous demand flow rate is at 370L/s which is well above the average demand requirement of 150L/s.

There have been a number of high turbidity events which have impacted on plant production, but in all instances Council were able to meet demand albeit storage reservoir levels were low at times but above acceptable minimum levels.

Fig 1. Rex Creek Intake level for the period July to September 2016

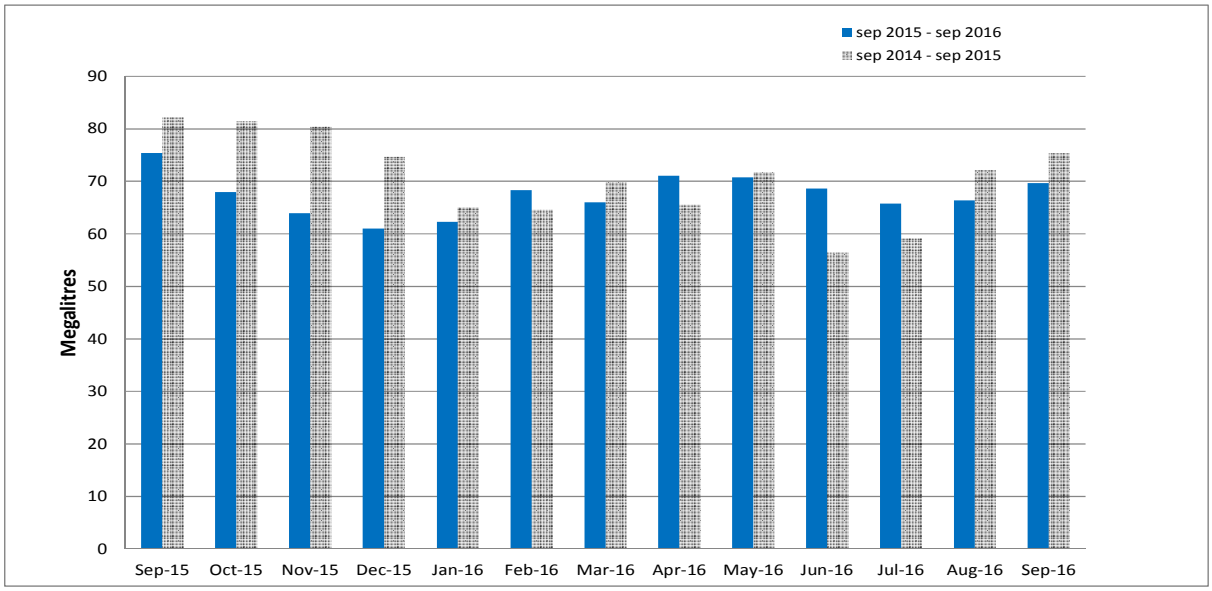


Mossman Water Treatment Plant was meeting demand capacity during this quarter. Current trends indicate increasing consumption typical of seasonal trends and lower rainfall.

Mossman Water Supply

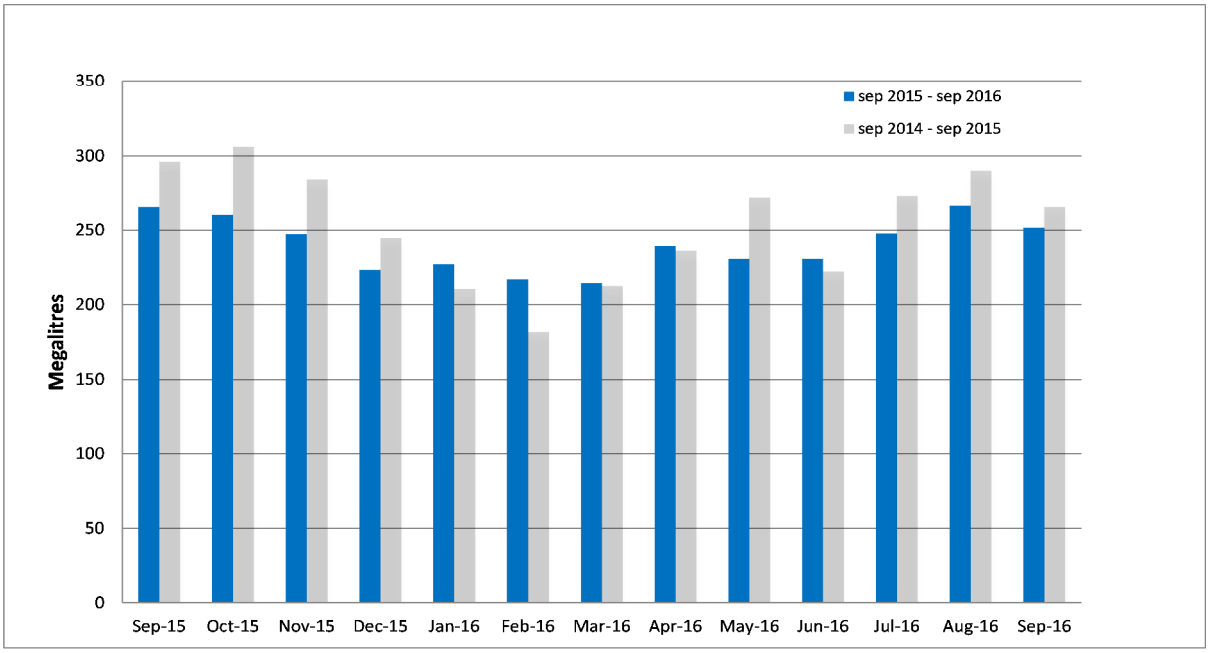
The total monthly consumption of water in Mossman, Cooya Beach and Newell Beach areas can be seen in Fig 2.

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.

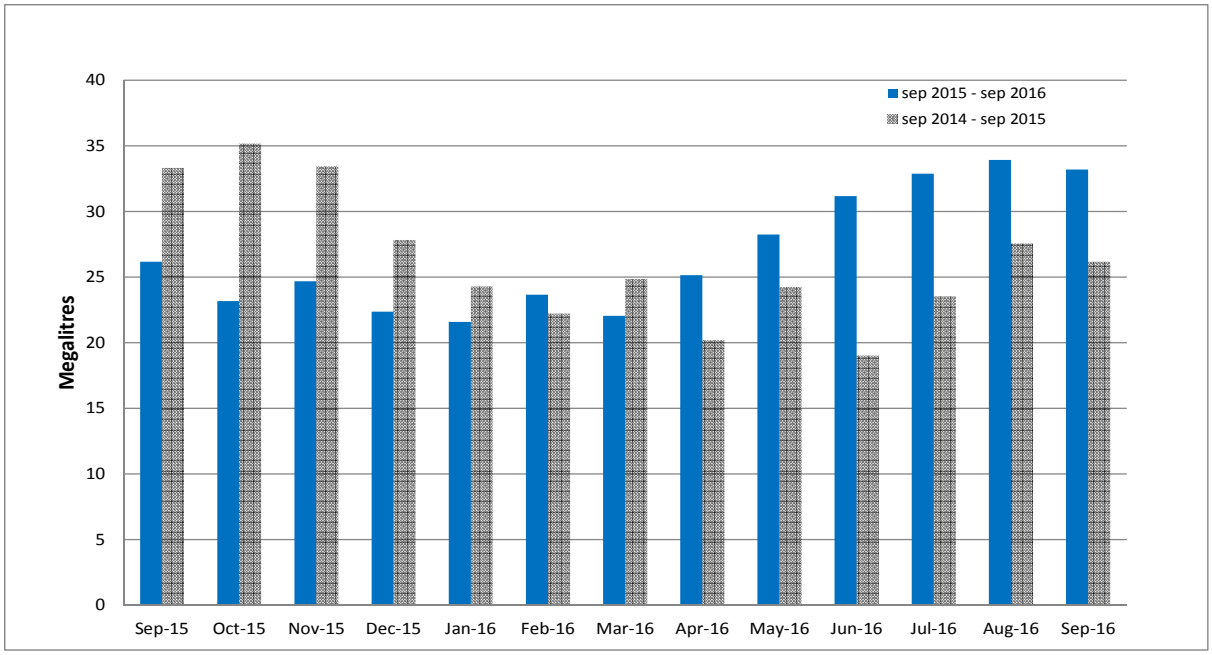
Fig 3. Port Douglas Scheme Monthly Consumption Figures



Whyanbeel Scheme
Whyanbeel Water Treatment Plant was fully operational and meeting demand in the quarter. Intake levels at Little Falls Creek have remained stable with good flows over the causeway and were more than adequate for full plant production capacity. Council officers are monitoring the reticulation system for suspected high usage and potential leaks as water consumption has been on the increase throughout this reticulation system for a number of months.

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

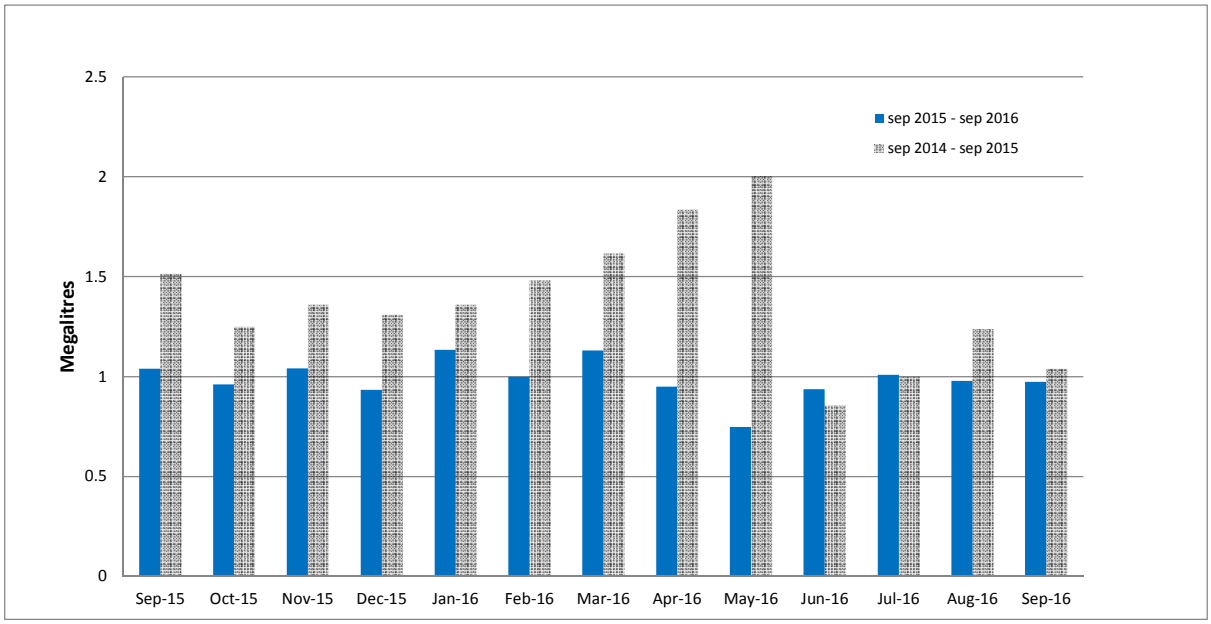
Fig 4. Whyanbeel Scheme Monthly Consumption Figures



Daintree Scheme
Daintree Water Treatment Plant was fully operational and meeting demand in the quarter. Intake levels at Intake Creek are stable and more than adequate for full plant production capacity.

Daintree Water Supply
The total monthly consumption of water in the Daintree scheme can be seen in Fig 5. Current issues of safety of staff at the Daintree Intake are being assessed and addresses in the current Capital Program.

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 July to 30 September 2016, a total of 335 treated and 3 raw water samples were taken in the 3 water supply schemes. A total of 234 samples were tested in the Douglas Water Laboratory and 73 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 July to September 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	*E.coli* CFU/ 100ml	Hetero-trophic Plate (HPC) 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
Jul-16	7.37	22.0	<5	0.97	1.02	<1	<1	<1
Aug-16	7.37	21.7	10.5	0.87	0.94	<1	<1	<1
Sep-16	7.50	23.3	9	0.89	0.96	<1	<1	<1

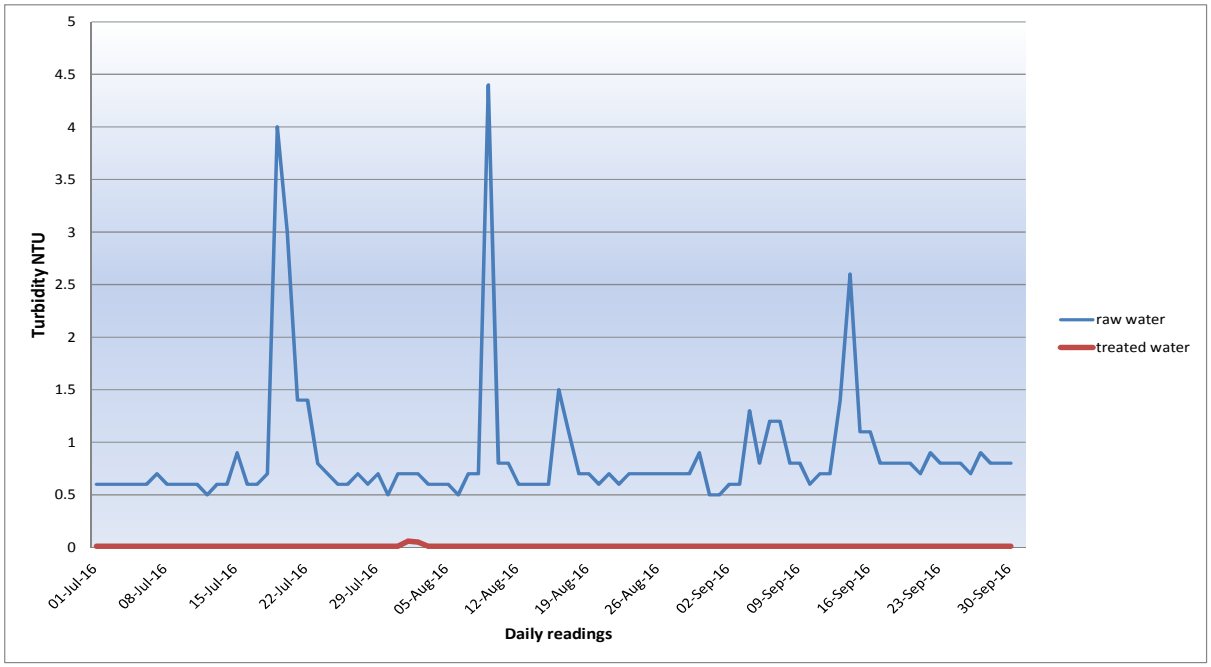
Table 4. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.

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 (HPC) 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
Jul-16	7.22	23.1	<5	0.86	0.92	<1	<2	<1
Aug-16	7.15	21.4	12.75	0.78	0.84	<1	<5	<1
Sep-16	7.20	22.4	16.5	0.93	1.02	<1	<3	<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 (HPC) CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0.1-4.0	Max 5.0	<1	-	0-10
Jul-16	7.88	25.0	0.70	0.76	<1	<1	<1
Aug-16	7.52	23.0	0.63	0.69	<1	<1	<1
Sep-16	7.59	25.2	0.57	0.66	<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., 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 July to September 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	*E.coli* CFU/ 100ml	Hetero-trophic Plate (HPC) 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
Jul-16	7.27	20.6	<5	0.91	0.97	<1	<1	<1
Aug-16	7.16	20.2	6.5	0.90	0.96	<1	<1	<1
Sep-16	7.26	21.5	5	0.92	0.99	<1	<1	<1

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

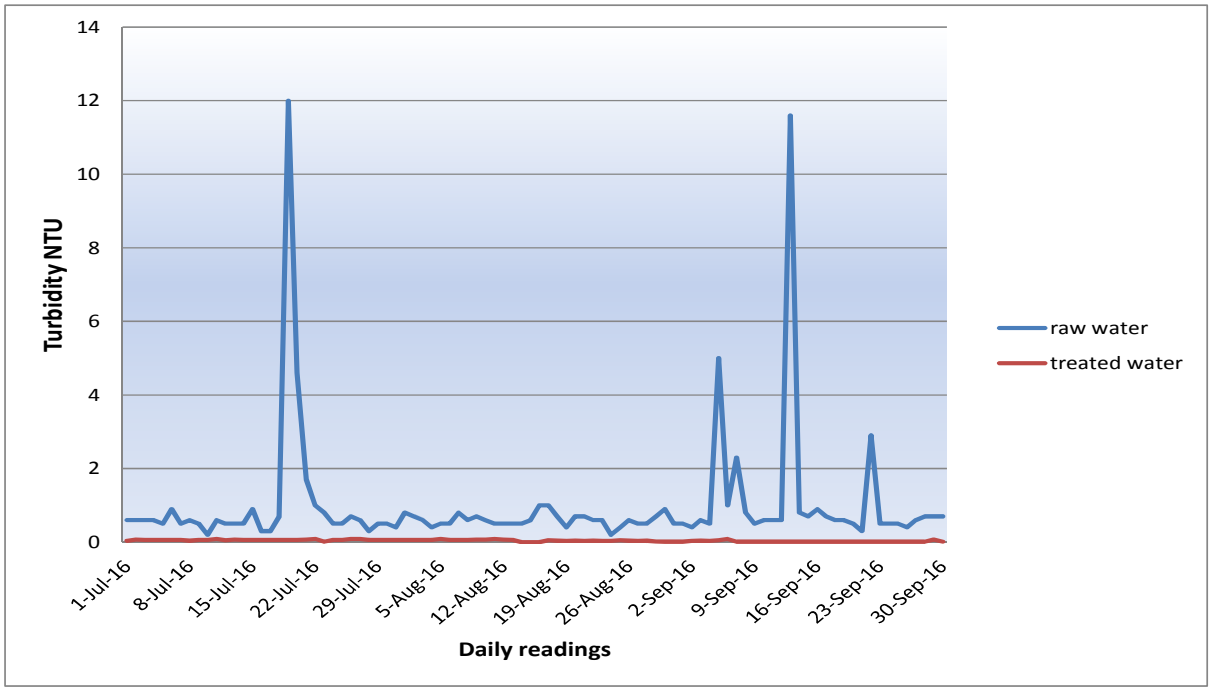
Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate (HPC) CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	Max 5.0	<1	-	0-10
Jul-16	7.42	22.9	<5	0.79	0.84	<1	4	<1

Aug-16	7.27	21.8	9.5	0.79	0.87	<1	<1	<1
Sep-16	7.09	23.3	9	0.79	0.87	<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 (HPC) CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0.1-4.0	Max 5.0	<1	-	0-10
Jul-16	8.08	23.8	0.69	0.73	<1	<7	<1
Aug-16	7.69	22.9	0.65	0.74	<1	<2	<1
Sep-16	7.50	24.5	0.56	0.64	<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 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 July to September 2016.

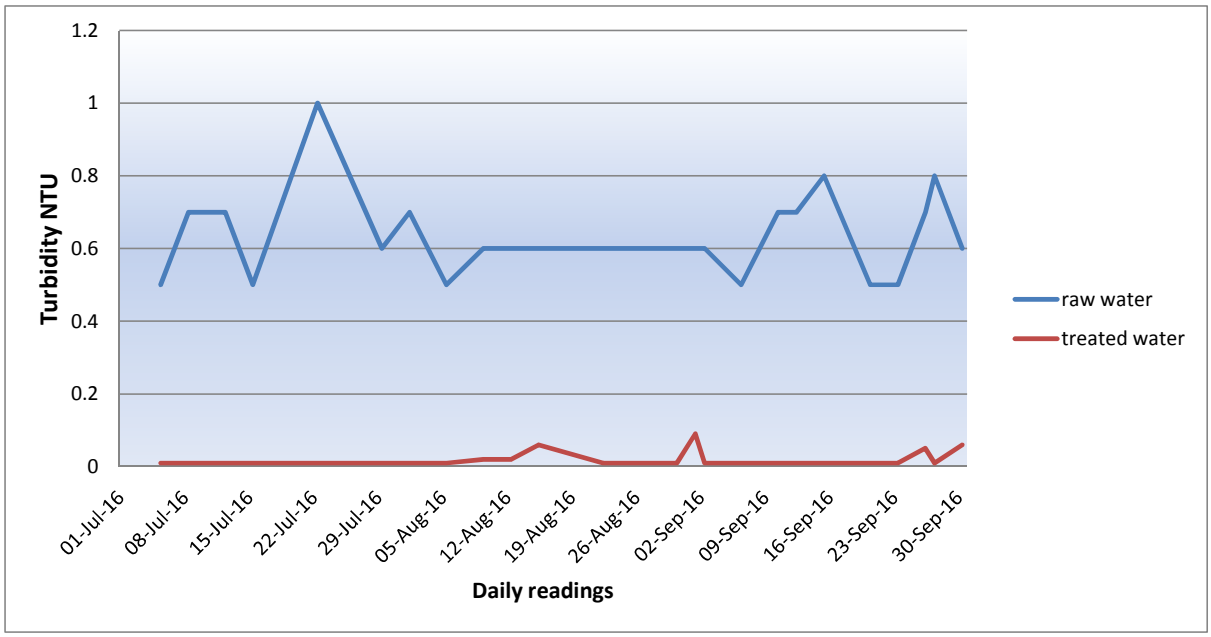
Table 9. Average monthly values for key operational and compliance parameters in treated water at Daintree Treatment Plant.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate (HPC) 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
Jul-16	7.63	22.2	<5	1.11	1.17	<1	1	<1
Aug-16	7.49	22.3	27	1.12	1.23	<1	1	<1
Sep-16	7.37	23.4	25	1.17	1.27	<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 (HPC) CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0.1-4.0	Max 5.0	<1	-	0-10
Jul-16	7.76	23.0	0.93	0.99	<1	17	<1
Aug-16	7.49	22.7	0.92	1.02	<1	1	<1
Sep-16	7.47	24.2	0.89	1.00	<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. Additionally, minor electrical storms

during this period caused power outages at some pump stations within this scheme. The sewer relining program continued in both networks.

Mossman and Port Douglas Wastewater Treatment Plants were compliant (except dry weather flow release limits) for this quarter, and the quarterly WaTERS report was submitted to DEHP for each treatment process. The annual Wastewater Report and the Biological Impact Monitoring Program Report were both submitted to DEHP.

Council staff are continuing coordination and actions with the Regulator regarding improvements and changes to the Mossman Wastewater Treatment Plant which has not met requirements for many years to meet the "dry weather flow release limits". A consultant has been engaged to assist with negotiations between the Department of Environment and Heritage Protection and Council to find alternative means to satisfy release limits, including an off-set program and recycled water production.

Table 11. Wastewater Reticulation Services

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	7	3
Sewer Chokes	1	1
Sewer Main Breaks	0	0
HCB Repairs (House Connection Branch)	2	1
Odour Complaints	0	0

5. Influent and irrigation flows

Port Douglas Wastewater Treatment Plant

A total of 338,649 kL of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average daily flow was 3,686 kL/day. Tanker truck contractors delivered 602 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 61% of the treated effluent was pumped to two resorts and the remaining discharged into the Dickson Inlet. The Sheraton Mirage received 104,361 kL and Reef Links received 101,279 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 165.5mm. On 18 July 2016, the highest rainfall on a day was recorded as 33.5mm. Daily SBR flows and total monthly flows for 2015/2016 are presented in Fig 9 and 10 respectively.

Fig 9. Port Douglas SBR Daily Flow

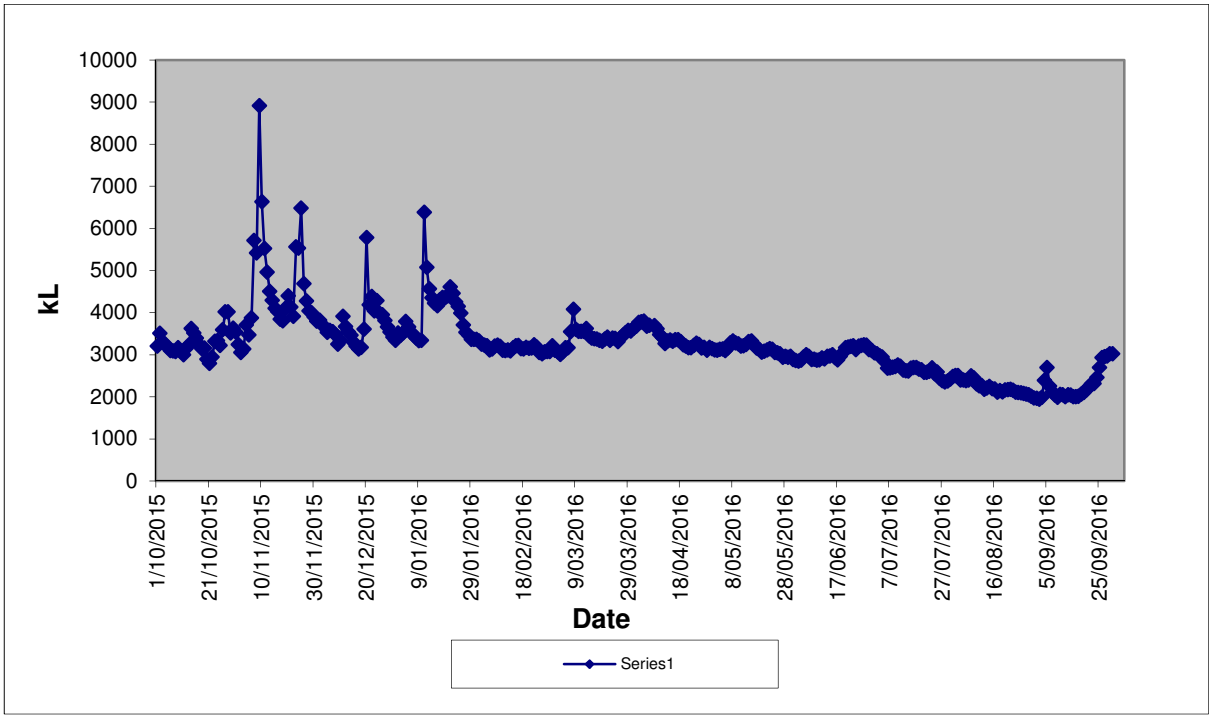

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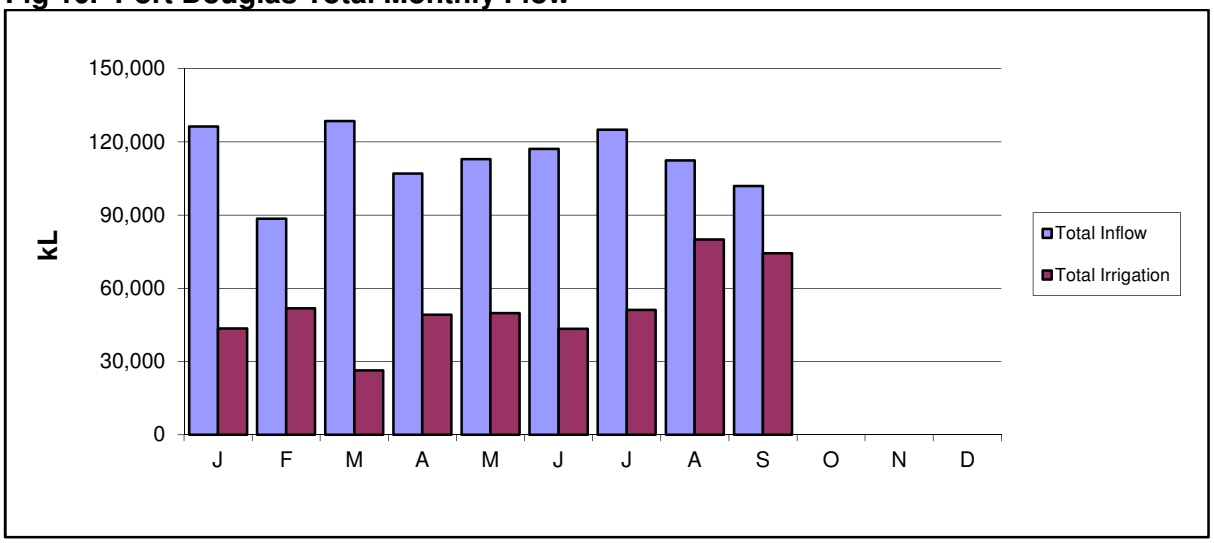
Fig 10. Port Douglas Total Monthly Flow



Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 76,865 kL during the reporting period. The average daily flow was 834 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River. A total of 233mm of rain fell on site for the reporting period with the highest daily rainfall measured at 22.5mm on 12 September 2016.

Daily flows from the Mossman Wastewater Treatment Plant and total monthly flows for 2015/2016 are presented in Fig 11 and 12 respectively.

Fig 11. Mossman Wastewater Treatment Plant Daily Flow

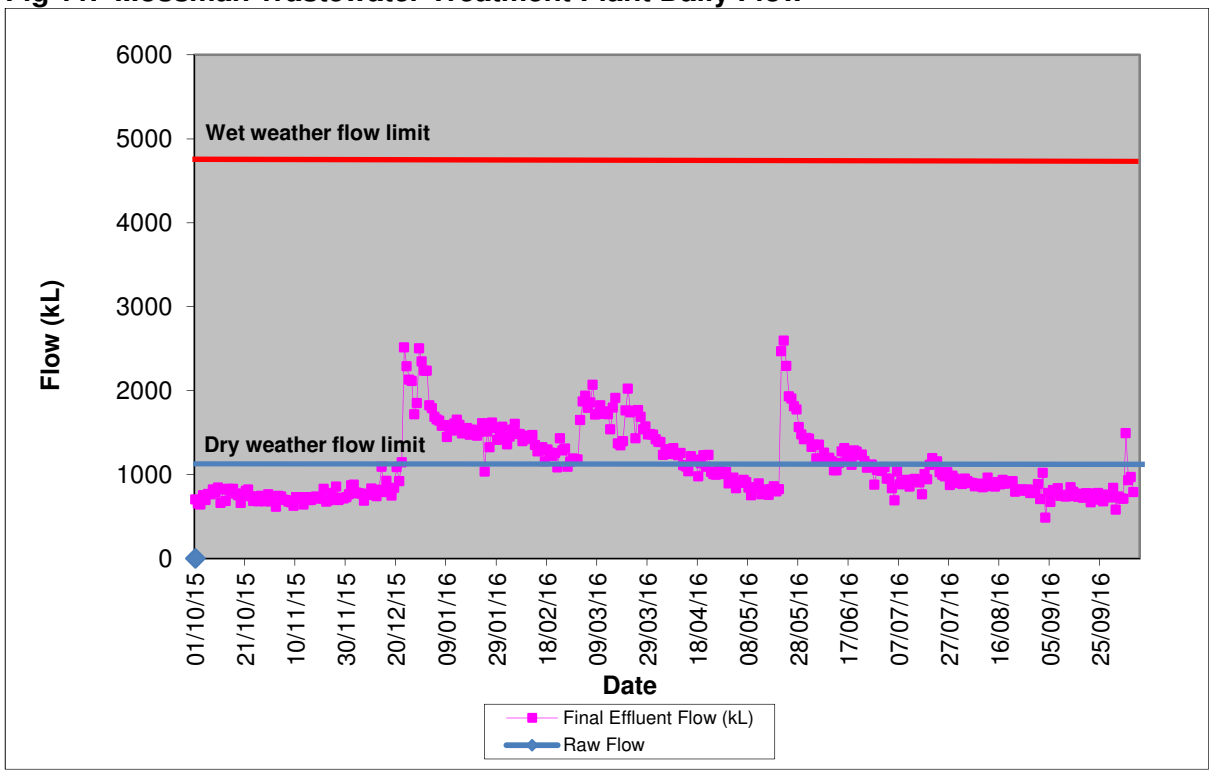
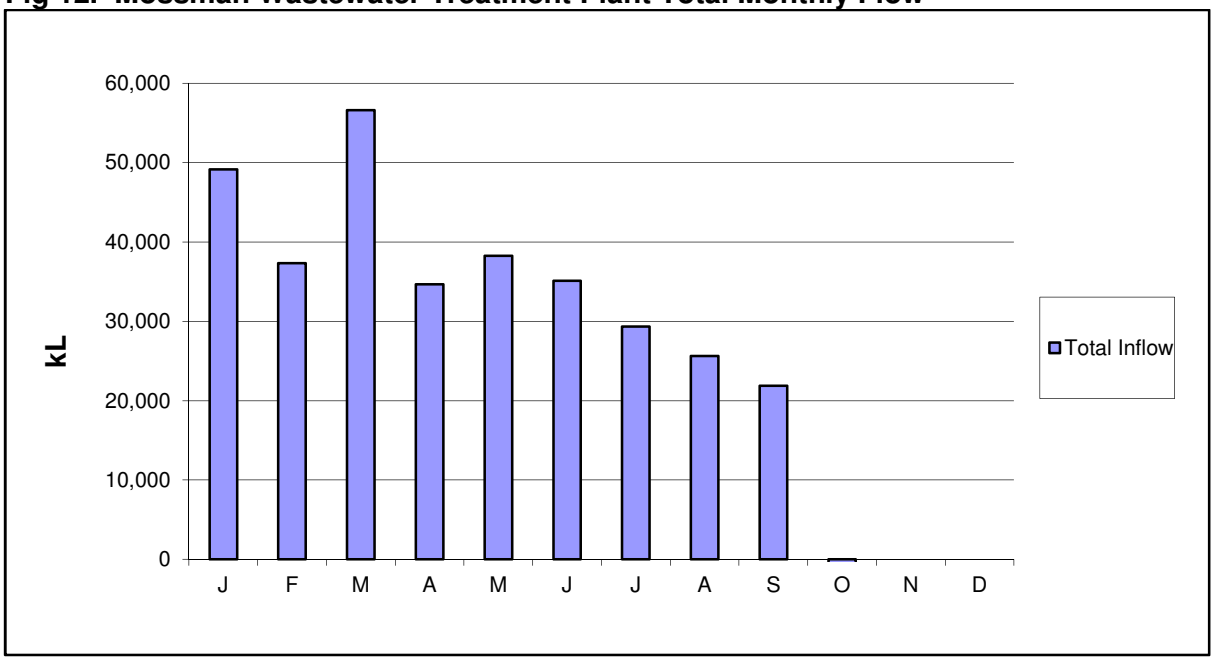


Fig 12. Mossman Wastewater Treatment Plant Total Monthly Flow



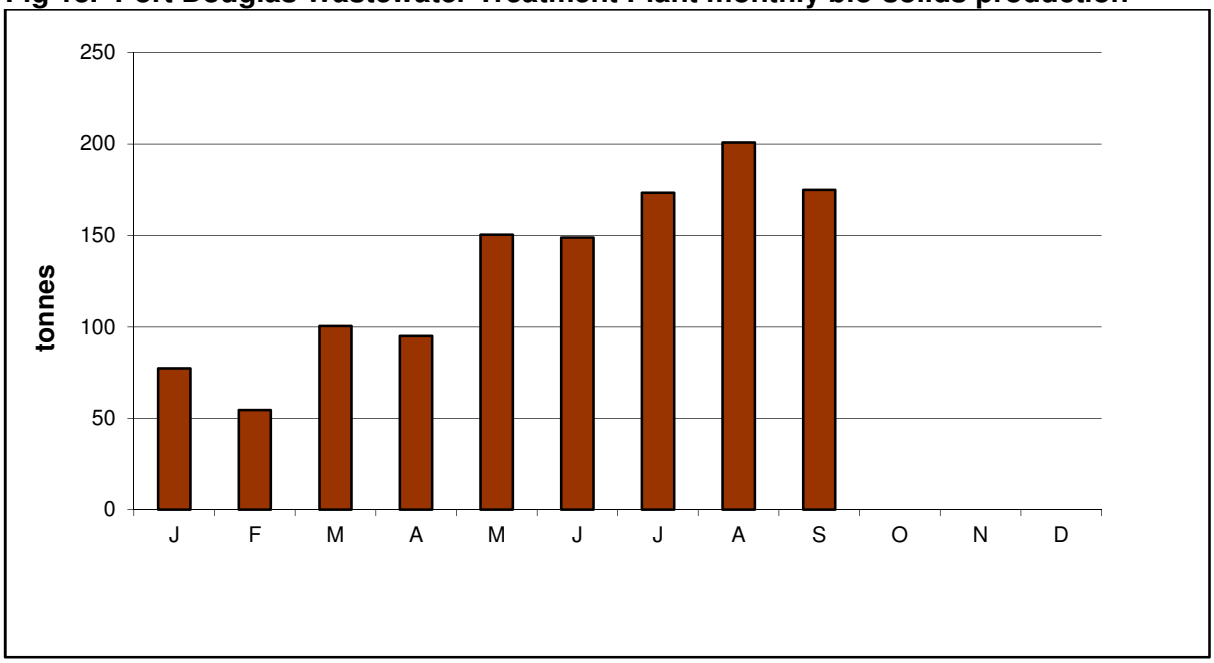
6. Bio-solids Production

Bio-solids were produced at the dewatering plants at Mossman Wastewater Treatment Plant (18% solids) and Port Douglas Wastewater Treatment Plant (14% 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 Bio-solids

At Port Douglas Wastewater Treatment Plant, 549 m^3 of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet biosolids equates to 25 dry tonnes. The monthly bio-solids production trends can be seen in Fig 13.

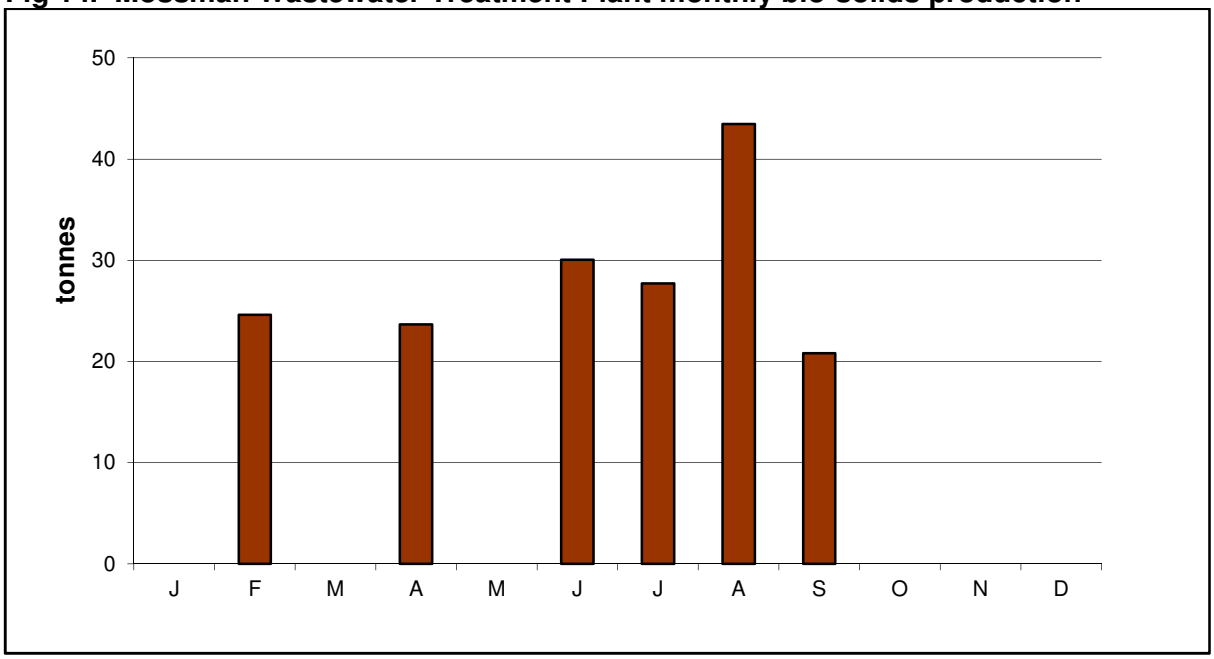
Fig 13. Port Douglas Wastewater Treatment Plant monthly bio-solids production



Mossman Wastewater Treatment Plant Bio-solids

At Mossman Wastewater Treatment Plant, 92m^3 of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet biosolids equates to 12.8 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 195 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 Flow conditions to ensure compliance for Mossman Wastewater Treatment Plant Dry Weather Flow.

Port Douglas Wastewater Treatment Plant – Effluent Quality

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

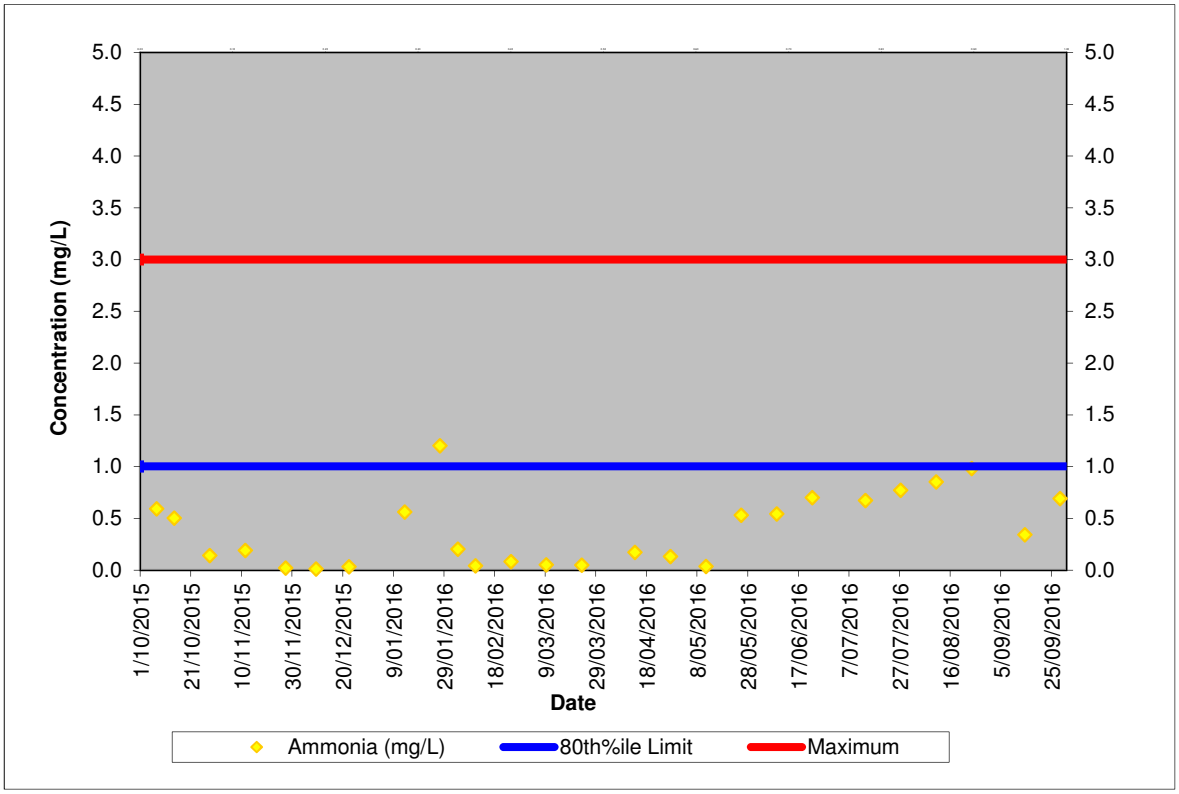


Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous

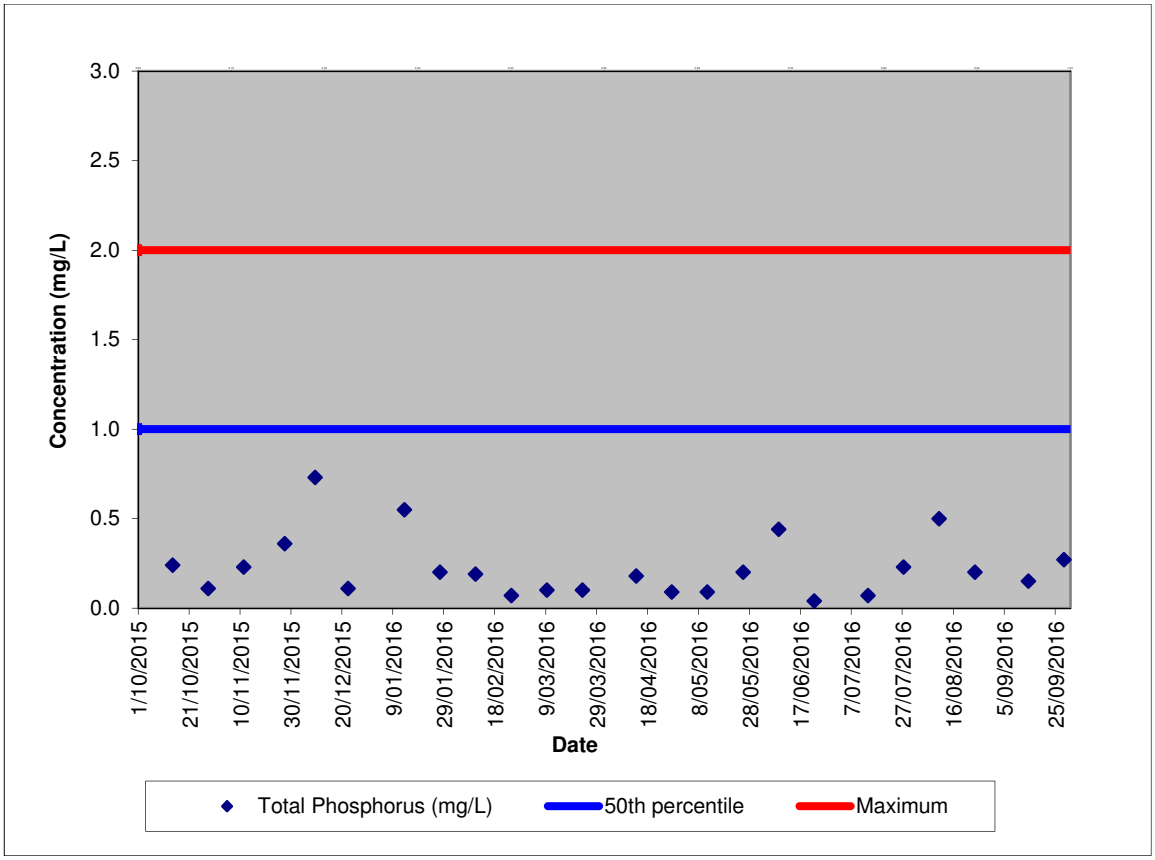


Fig 17. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids

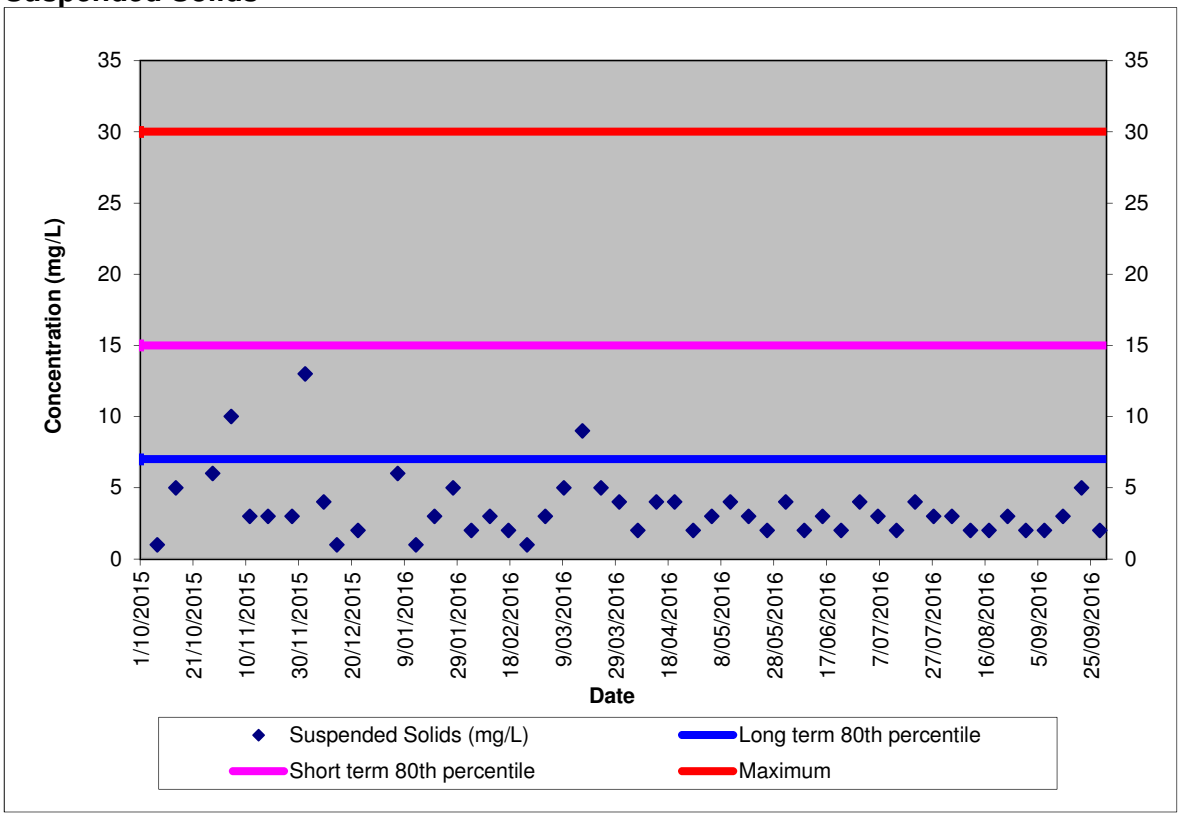
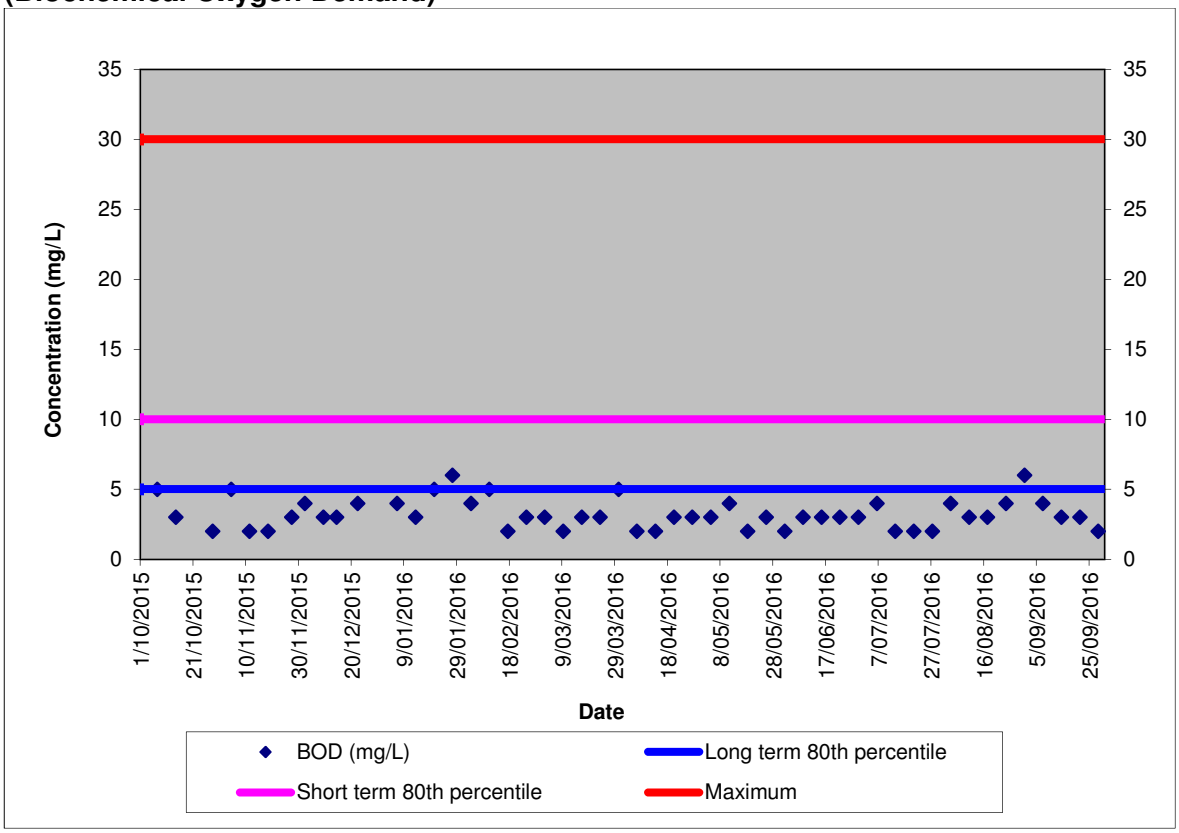


Fig. 18 Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)



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

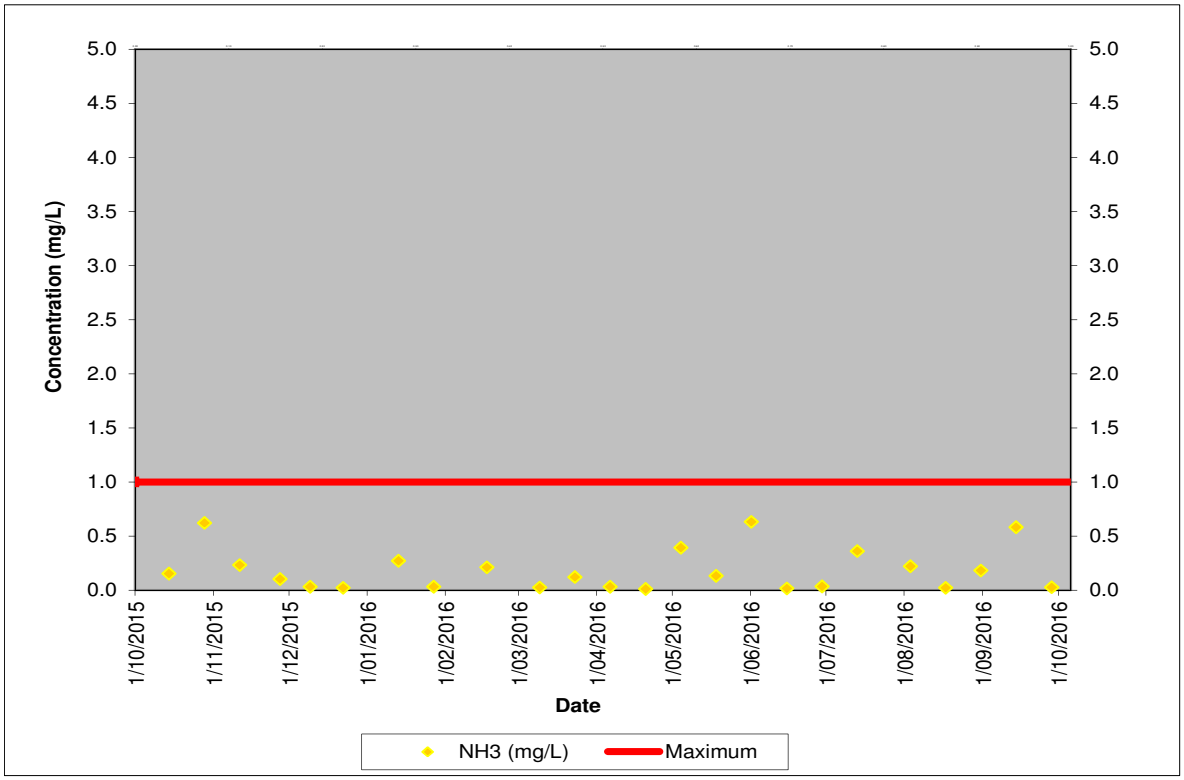


Fig. 20 Mossman WWTP Final Effluent Test Results for Total Phosphorous

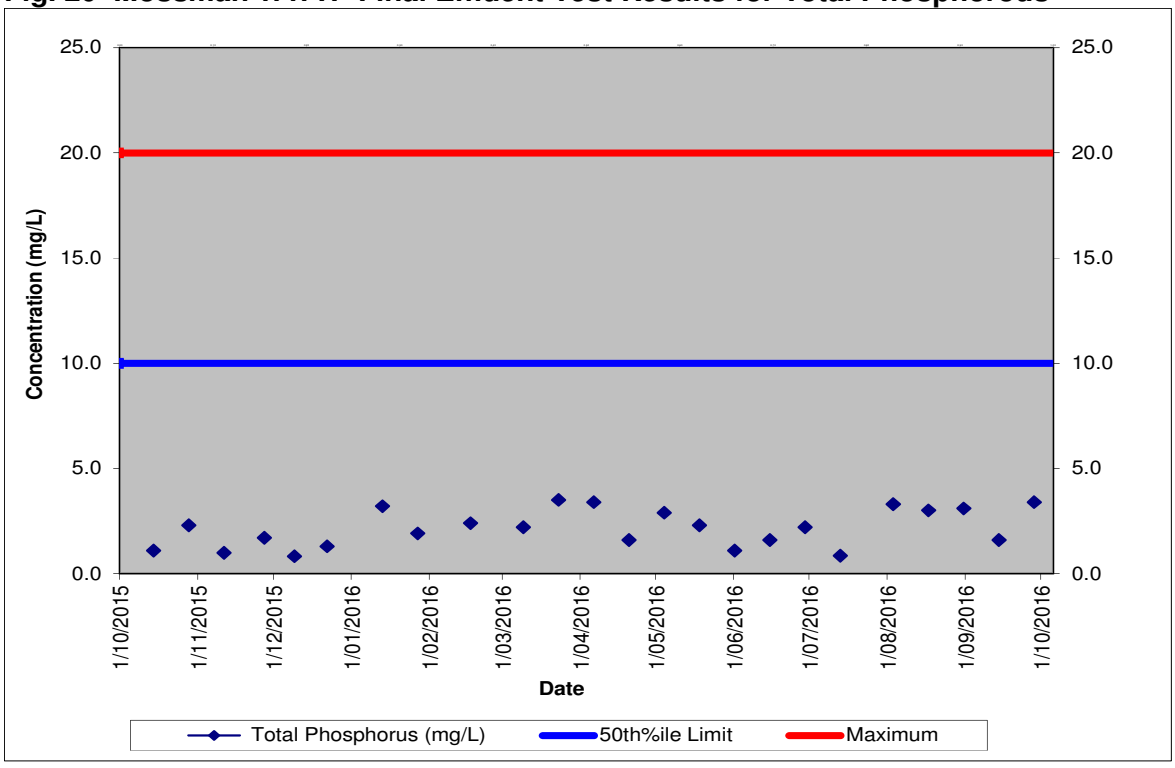


Fig. 21 Mossman WWTP Final Effluent Test Results for Total Suspended Solids

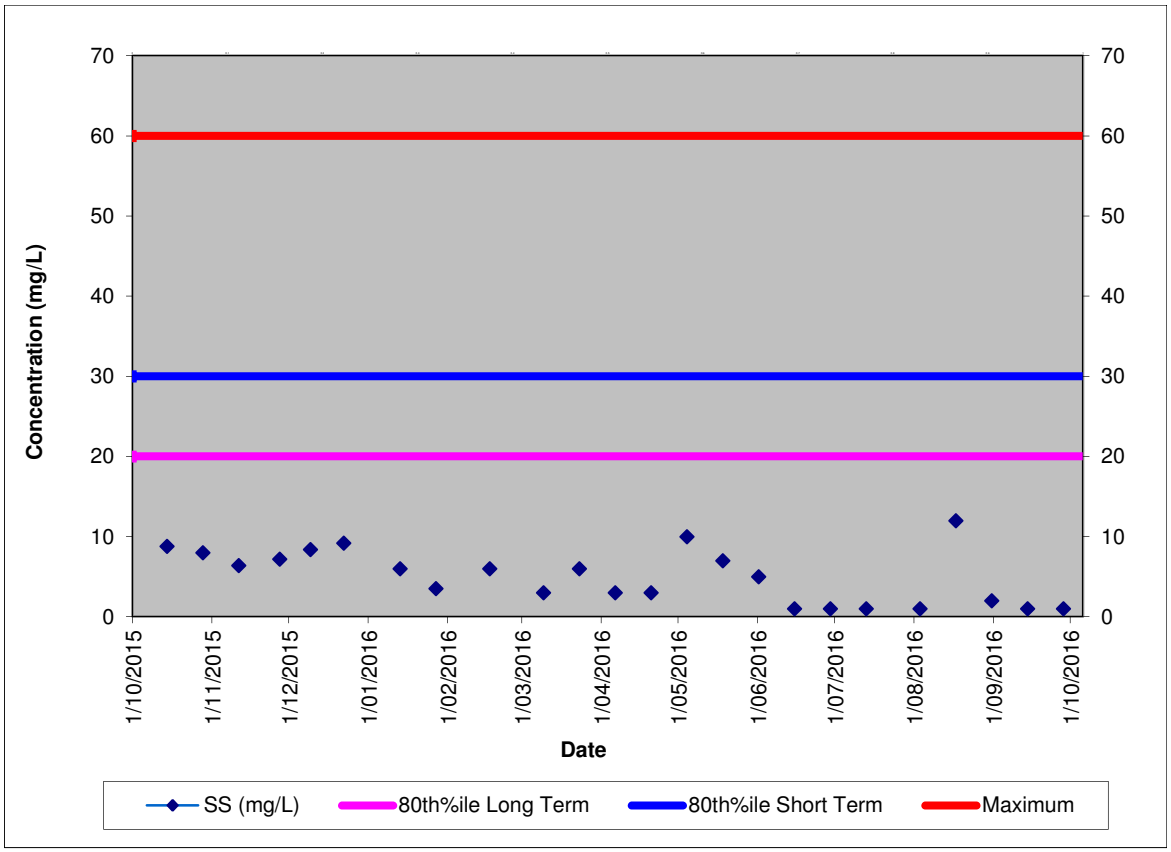


Fig. 22 Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)