5.11. WATER AND WASTEWATER QUARTERLY REPORT FOR THE PERIOD ENDING 31 MARCH 2016

REPORT AUTHOR(S): Wouter van der Merwe, Manager Water and Wastewater
GENERAL MANAGER: Paul Hoye, 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 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 January to March 2016.

Whilst the results are generally positive the areas for improvement are noted and will be the focus of the branch over the next quarter. During this reporting period, significant process was noted in all of the 36 Water and Wastewater capital improvements projects. The progress of these projects is reported in a separate Council report.

Several capital items were delivered and partly installed, inter alia the two Calcium Hypochlorite projects to facilitate automated chlorination at Flagstaff and Rocky Point reservoirs. Capital projects associated with SCADA, telemetry and server upgrades across all Water and Wastewater plants are in the final testing and fault finding phases.

The Water and Wastewater Branch successfully fulfilled regulatory reporting during this quarter. The Council endorsed Drinking Water Quality Management Plan (DWQMP) was approved on 1 March 2016 by the Department of Energy and Water Supply (DEWS).

BACKGROUND

This report is the 3rd Quarterly Report submitted by the Water and Wastewater Branch during the 2015/2016 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 3rd 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:

WW1 - Rehabilitation of sewer network in Mossman & Port Douglas.

WW2 - Wastewater and Water Treatment Plants Server SCADA Citec upgrade and Programmable Logic Controller (PLC) SCADA Citec upgrade.

WW3 - Drinking Water Storage: Investigate and repair vermin proofing at all water storage/ reservoirs in the Water Supply Schemes.

WW4 - Review and amend Drinking Water Quality Management Plan (DWQMP).

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:

Information Provider Bringing people together to develop solutions to problems.

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

Attachment 1 Water and Wastewater Quarterly Report for the period ending 31 March 2016.

Water and Wastewater Quarterly Report
1 January 2016 - 31 March 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 and the Department of Environment and Heritage Protection.

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.

Table 1. Water Reticulation Services

Douglas Shire Reticulation (all schemes)	
Settlement meter reads	88
New water services connections	11
Service repairs	91
Water mains repairs	6
Water Quality Complaints	4
Flushing Events: Mossman/Port Douglas/ Cooya/ Newell	3
Flushing Events: Whyanbeel/Wonga	1
Flushing Events: Daintree/ De Meio	2

Table 2. Water Complaints

Address	CRM Number & Date	Nature of water complaint	How was it resolved	Response Time
46 Andrews St Newell Beach	22952 21/3/16	Distinctive taste	Flushed Newell Scheme and at meter. Residual Chlorine after flushing: 0.05 mg/l.	90 mins
50 Andrews St Newell Beach	22958 21/3/16	Taste like iodine	Flushed hydrant points and at meter. Residual Chlorine: 0.07 mg/l. Water quality team notified.	30 mins
42 Andrews St Newell Beach	23160 23/3/16	Bad taste in water	Flushed at hydrant points and at mete. Residual Chlorine: 0.07mg/l. Water quality team notified.	35 mins
1291R Mossman-Daintree Rd Rocky Point	23317 29/3/16	Smelly-itchy feeling	Flushed whole area. Flushed at meter. Residual Chlorine: 0.08mg/l. Water quality team notified.	30 mins

2. Water schemes and potable water consumption

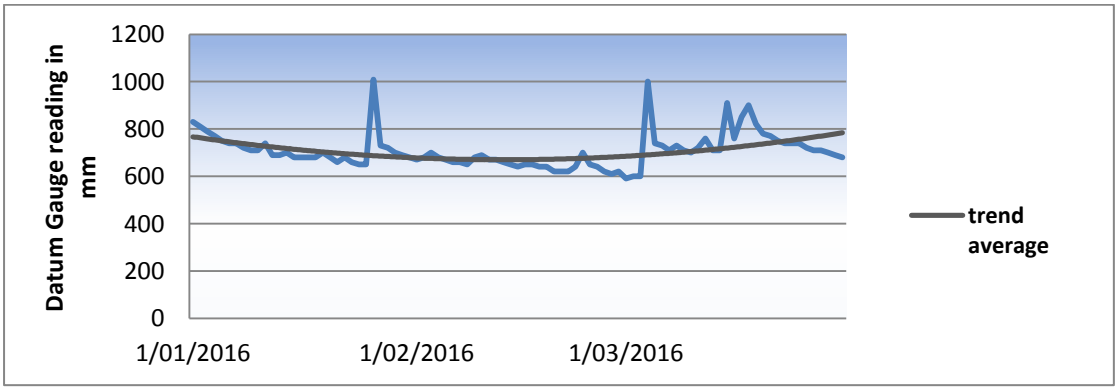
Raw Water quality is good in all intakes averaging below 1.0 NTU.

Rain periods developed during the start of the reporting period with some heavy falls causing localised flooding in the water plant intake creeks. A number of significant high raw water turbidity events occurred as a result of isolated heavy rains causing operational issues at the water plants.

With all intakes at capacity, water restrictions were lifted in early January 2016. This also coincided with a decrease in consumption from all water schemes typical of wet season demand trends. With forecasts indicating a below average wet season and increased possibility of an extended dry season, water restrictions may need to be re-visited within the next three months.

Mossman/Port Douglas Schemes
Rex Creek intake level has adequate capacity to meet maximum extraction flows of >220L/s with no impact on production at this stage.

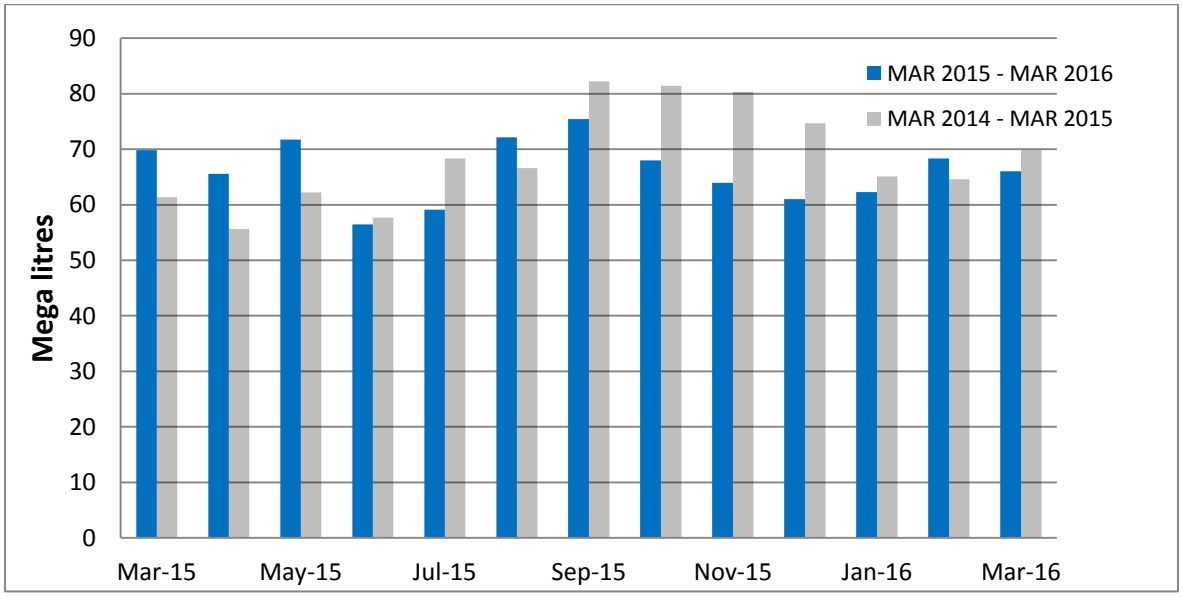
Fig 1. Rex Creek Intake level for the period January to March 2016



Mossman Water Treatment Plant is meeting demand capacity. Net treated water outflow from the Mossman WTP for the reporting period was 844.16 Megalitres. This represents consumption of 194.06 Megalitres for the Mossman scheme and 650.09 Megalitres for the Port Douglas scheme.

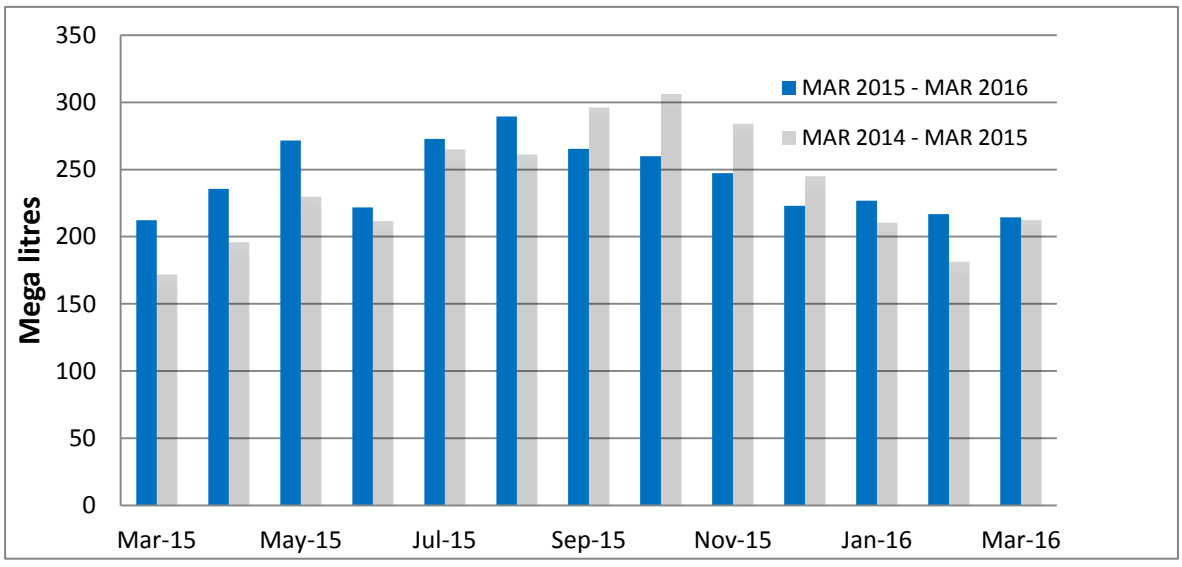
Mossman Water Supply
The total monthly consumption of water in Mossman, Cooya Beach and Newell Beach areas can be seen in Fig 2.

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.

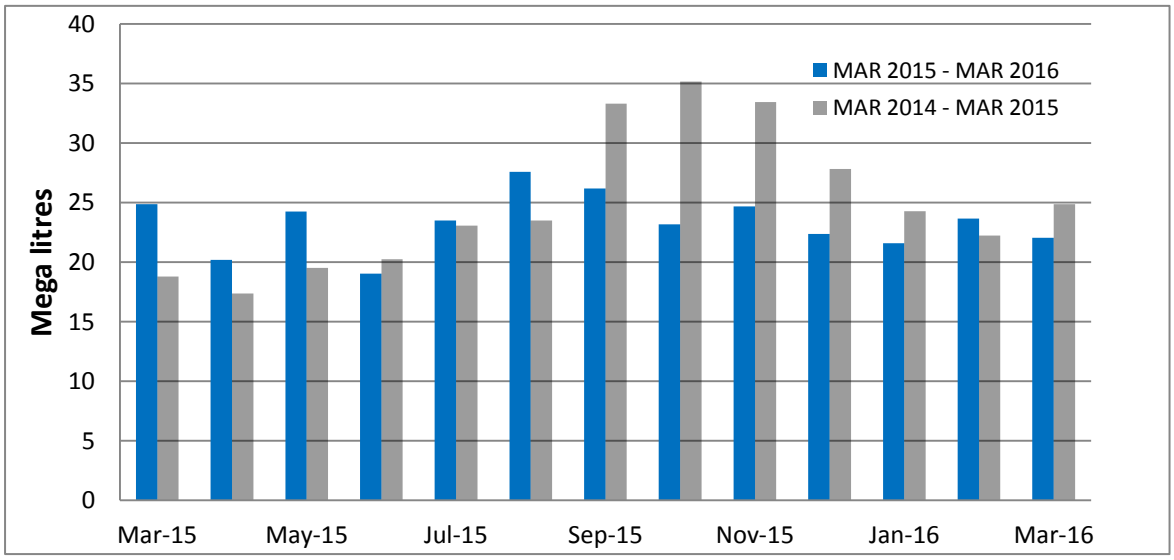
Fig 3. Port Douglas Scheme Monthly Consumption Figures



Whyanbeel Scheme
Whyanbeel Water Treatment Plant is fully operational and meeting demand. Net treated water outflow from the Whyanbeel WTP for the reporting period was 66.38 Megalitres and represents consumption for the entire Whyanbeel and Wonga water supply scheme.

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

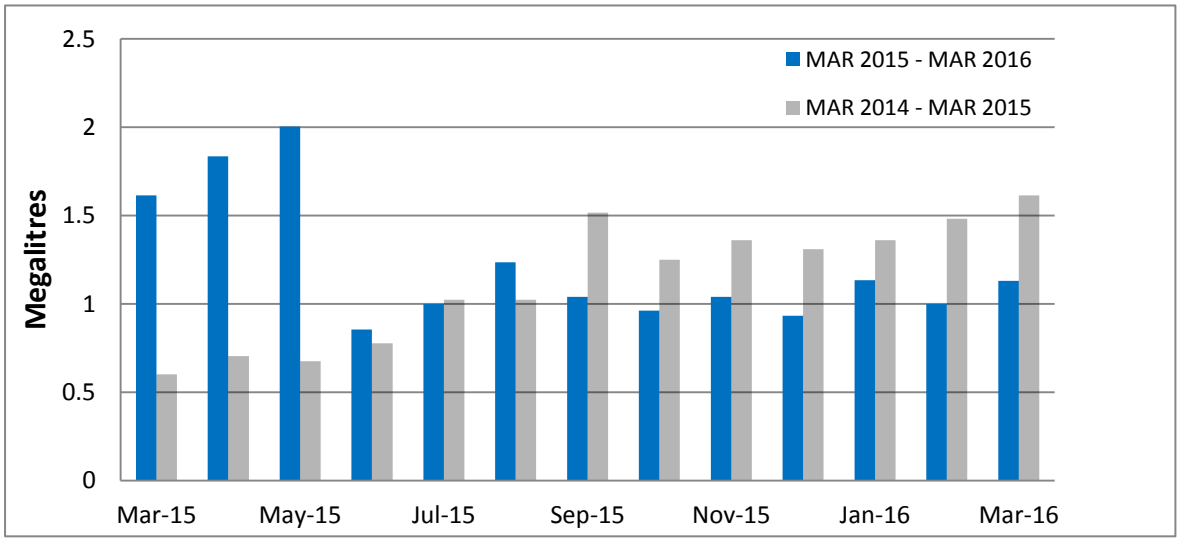
Fig 4. Whyanbeel Scheme Monthly Consumption Figures



Daintree Scheme
Daintree Water Treatment Plant is fully operational and meeting demand. Intake levels at Intake Creek have increased and are adequate for full plant production capacity. Net treated water outflow from the Daintree WTP for the reporting period was 3.51 Megalitres. This represents consumption for the entire Daintree water supply scheme.

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 during this quarter. The Council endorsed Drinking Water Quality Management Plan (DWQMP) was approved on 1 March 2016 by the Department of Energy and Water Supply (DEWS).

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 to 31 March 2016, a total of 325 treated and raw water samples were taken in the 3 water supply schemes. A total of 250 samples were tested in the Douglas Water Laboratory and 75 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 2015.

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/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	Max 5.0	<1	-	0-10
Jan-16	7.31	23.4	5	0.83	0.89	<1	<1	<1
Feb-16	7.64	24.5	5	0.78	0.98	<1	<1	<1
Mar-16	7.35	24.2	7	0.90	0.96	<1	1	<1

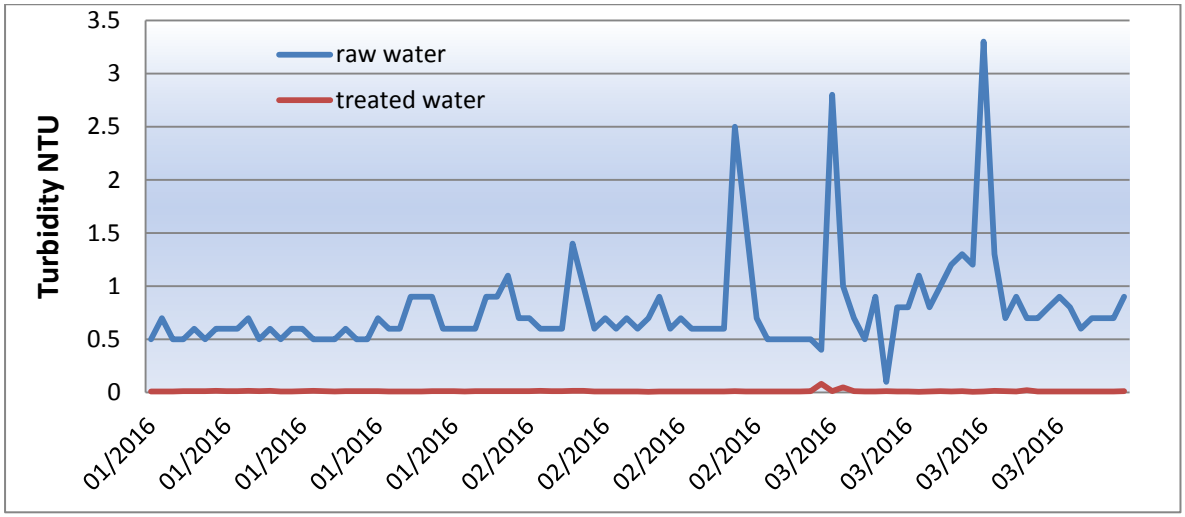
Table 4. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.

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 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-16	7.34	25.3	7	0.76	0.82	<1	<2	<1
Feb-16	7.26	26.7	6	0.71	0.78	<1	1	<1
Mar-16	6.97	26.1	6.5	0.76	0.81	<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/100 ml	Hetero-trophic Plate Count CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0.1-4.0	Max 5.0	<1	-	0-10
Jan-16	7.60	26.7	0.48	0.53	<1	<1	<1
Feb-16	7.50	28.2	0.61	0.66	<1	<1	<1
Mar-16	7.75	274	0.43	0.47	<1	52	<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 January to March 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 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-16	6.96	23.7	<5	0.87	0.94	<1	<1	<1
Feb-16	6.93	23.6	<5	1.04	1.21	<1	<1	<1
Mar-16	7.00	24.8	6	0.85	0.95	<1	<1	<1

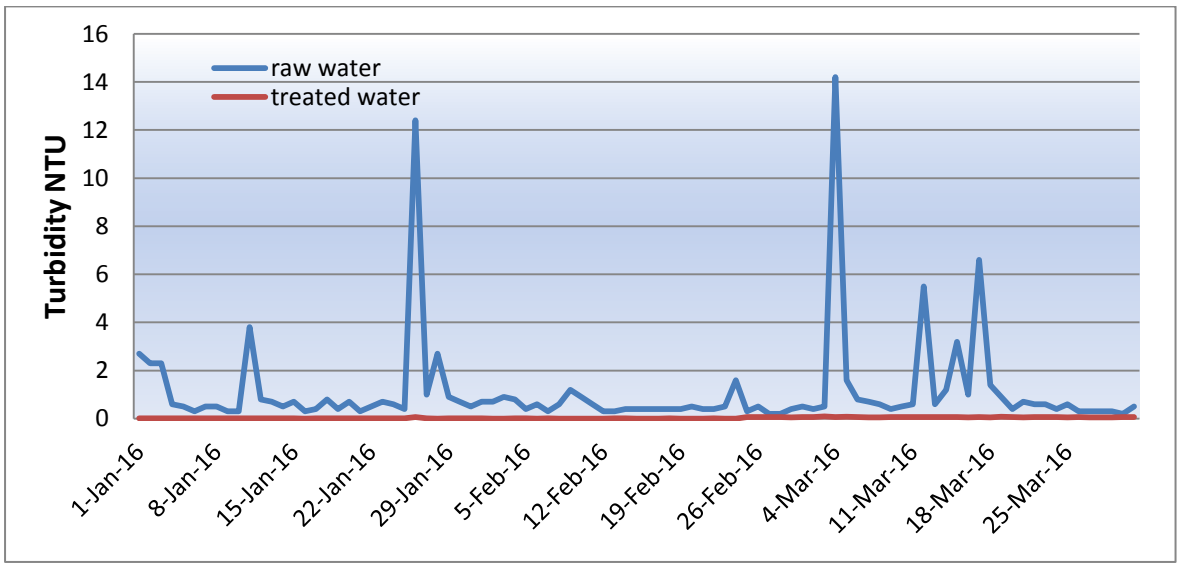
Table 7. Average monthly values for key operational and compliance parameters in the Whyanbeel Reservoir.

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/100ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	Max 5.0	<1	-	0-10
Jan-16	7.37	26.2	8	0.35	0.40	<1	10	<1
Feb-16	7.55	27.1	8	0.84	0.87	<1	26	1
Mar-16	7.37	28.0	6	0.38	0.43	<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/100 ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0.1-4.0	Max 5.0	<1	-	0-10
Jan-16	8.13	27.2	0.22	0.30	<1	<3	<1
Feb-16	8.01	28.3	0.19	0.23	<1	8	<1
Mar-16	8.05	28.8	0.22	0.26	<1	<10	<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 January to March 2016.

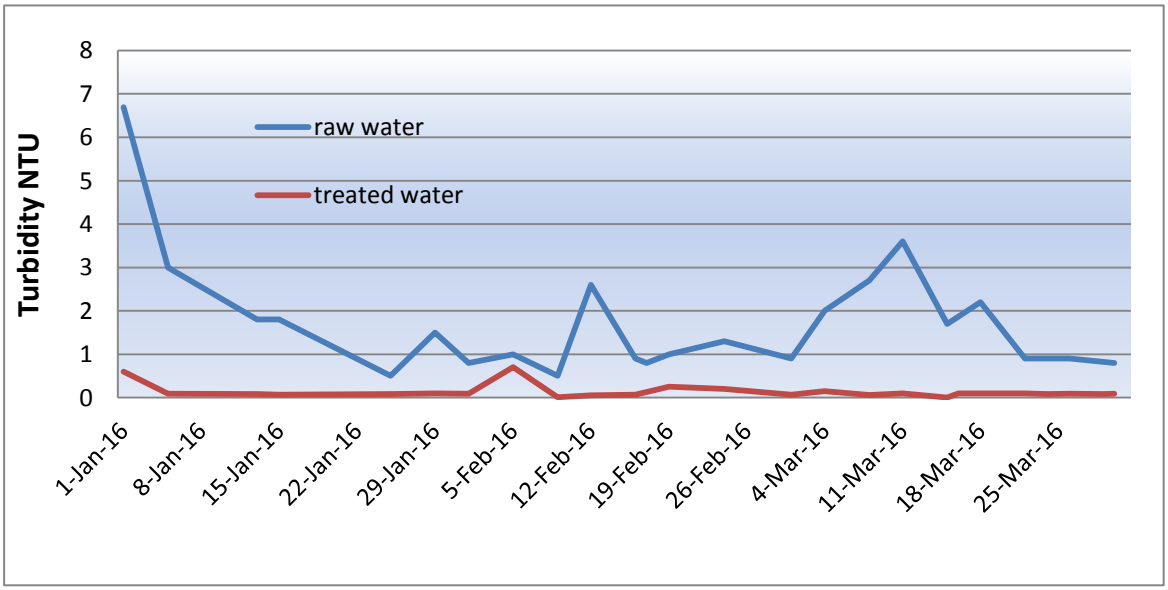
Table 9. Average monthly values for key operational and compliance parameters in treated water at Daintree Treatment Plant.

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 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-16	7.27	26.0	17	0.96	1.02	<1	1	<1
Feb-16	7.39	26.9	19	0.85	0.91	<1	<1	<1
Mar-16	7.28	27.4	18	0.98	1.04	<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/100 ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0.1-4.0	Max 5.0	<1	-	0-10
Jan-16	7.61	26.1	0.69	0.74	<1	61	<1
Feb-16	7.65	26.5	0.56	0.61	<1	17	<1
Mar-16	7.44	28.0	0.65	0.71	<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.

Table 11. Wastewater Reticulation Services

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	8	3
Sewer Chokes	2	1
Sewer Main Breaks	0	0
HCB Repairs (House Connection Branch)	1	0
Odour Complaints	0	0

5. Influent and Irrigation Flows

Port Douglas Wastewater Treatment Plant

A total of 343,297 kL of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average daily flow was 3,772 kL/day. Tanker truck contractors delivered 429 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 36% of the treated effluent was pumped to two resorts and the remaining discharged into the Dickson Inlet. The Sheraton Mirage received 70,917 kL and Reef Links received 50,785 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 729 mm. On 10 March 2016, the highest rainfall on a day was recorded as 72mm. Daily SBR flows and total monthly flows for 2014/2015 are presented in Fig 9 and 10 respectively.

Fig 9. Port Douglas SBR Daily Flow

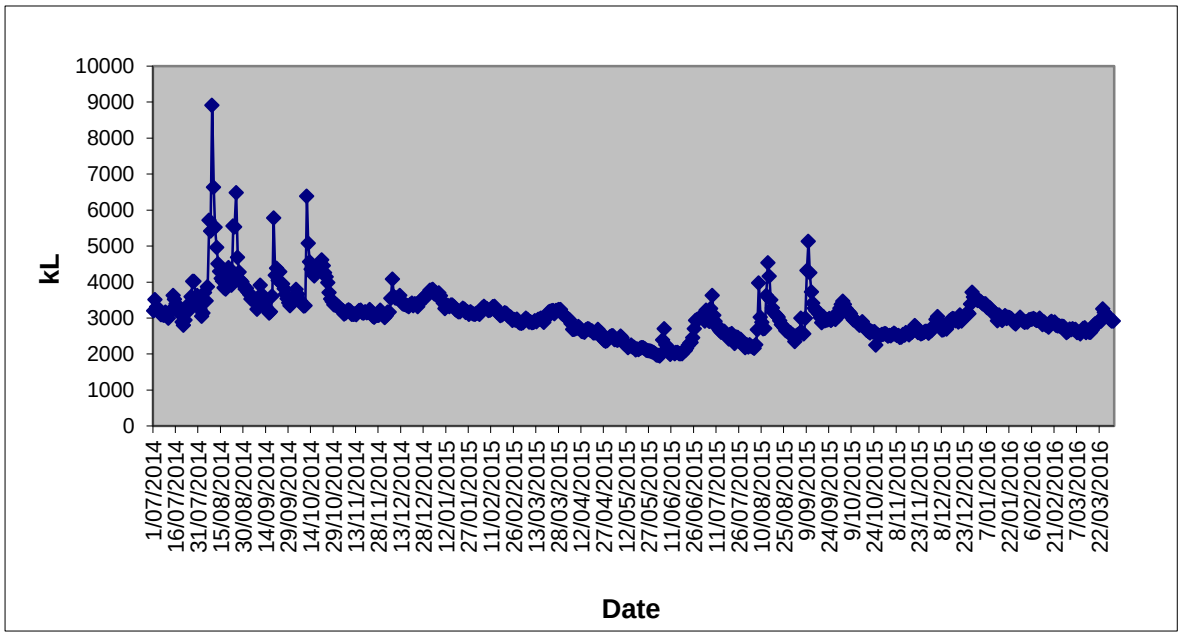
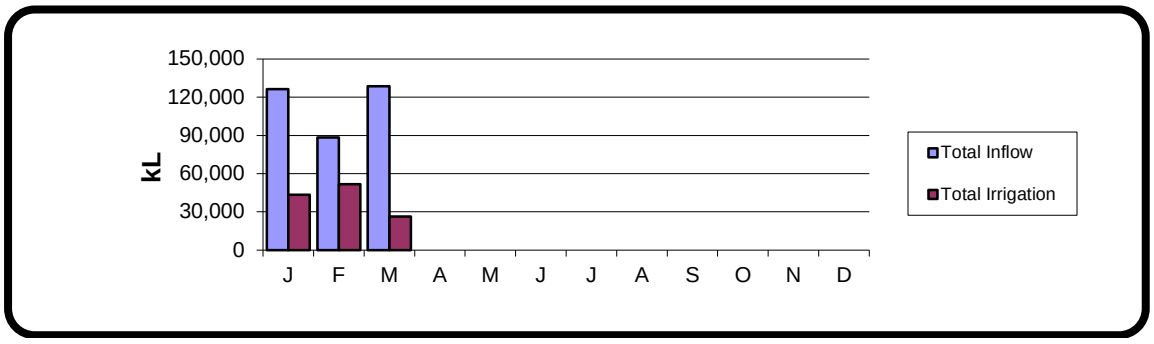


Fig 10. Port Douglas Total Monthly Flow



Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 138,475 kL during the reporting period. The average daily flow was 1,521 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River. A total of 836 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 108mm on 16 March 2016. As a result of the high rainfall in the latter part of the reporting period, the plant intermittently didn't comply with the dry weather flow limit due to ingress and infiltration into the sewer network.

Daily flows from the Mossman Wastewater Treatment Plant and total monthly flows for 2014/2015 are presented in Fig 11 and 12 respectively.

Fig 11. Mossman Wastewater Treatment Plant Daily Flow

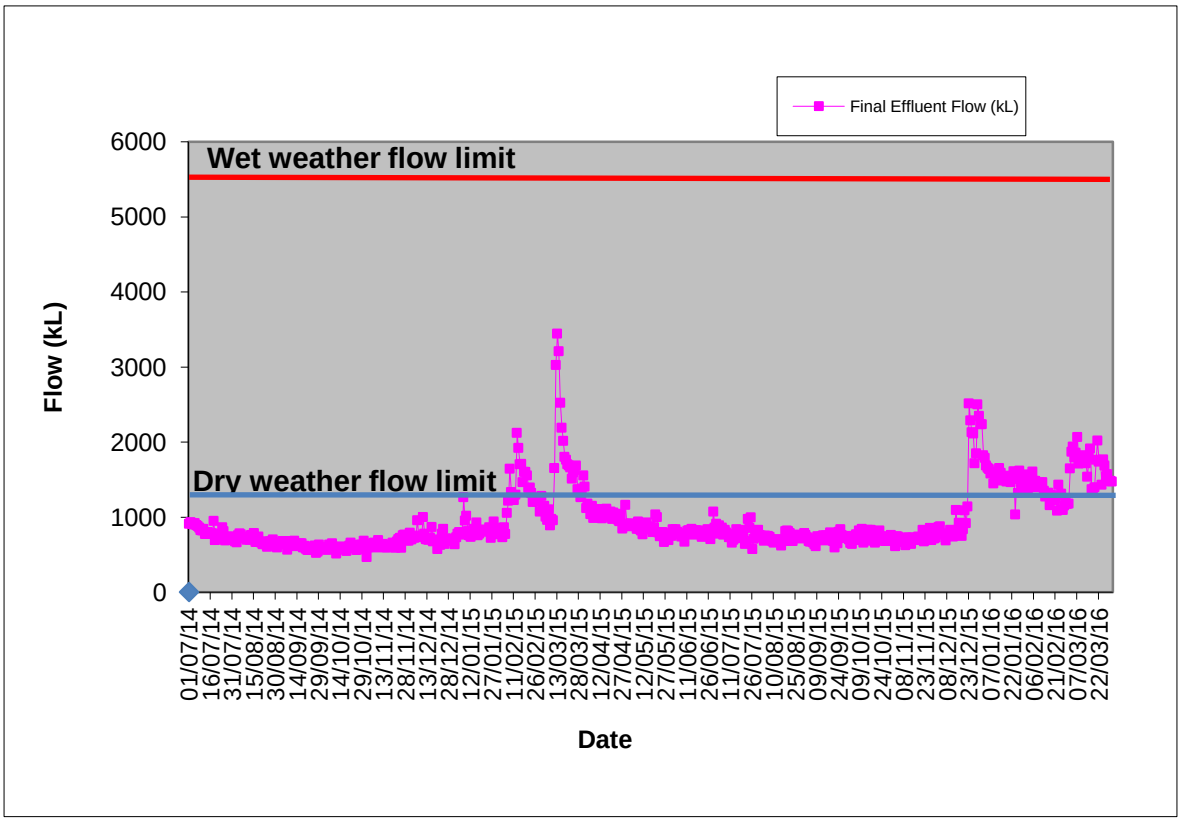
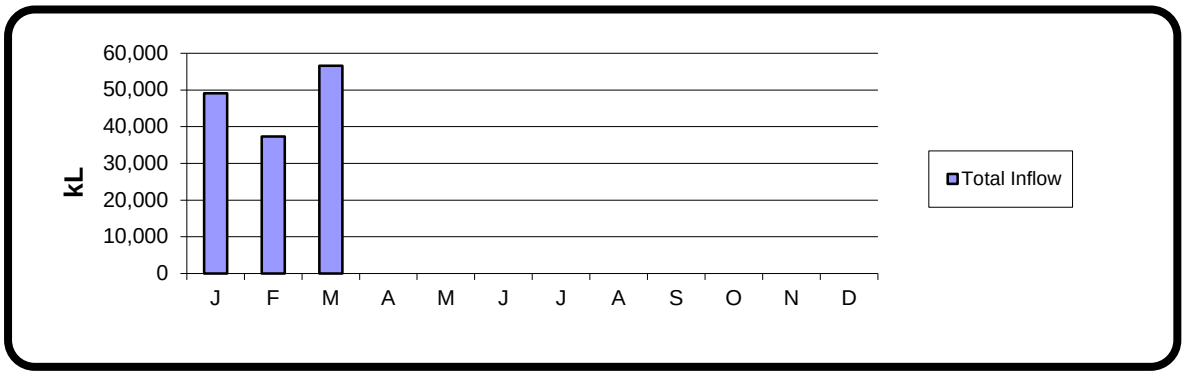


Fig 12. Mossman Wastewater Treatment Plant Total Monthly Flow



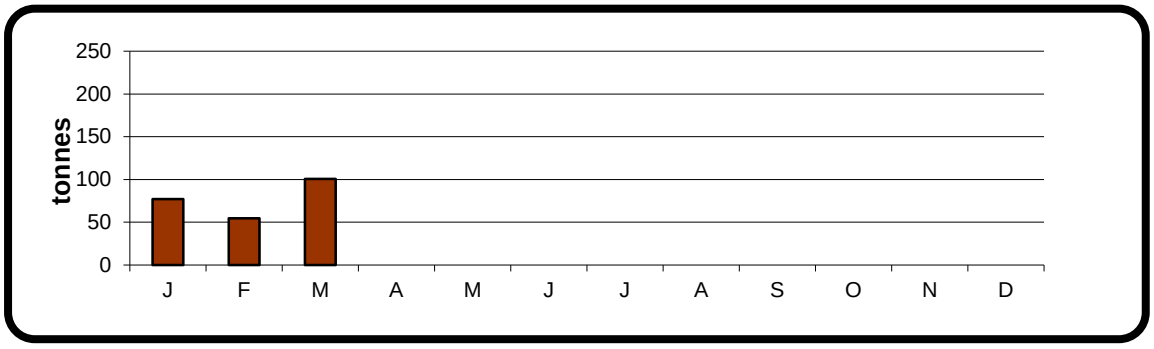
6. Bio-solids Production

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

At Port Douglas Wastewater Treatment Plant, 232 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 33 dry tonnes. The monthly bio-solids production trends can be seen in Fig 13.

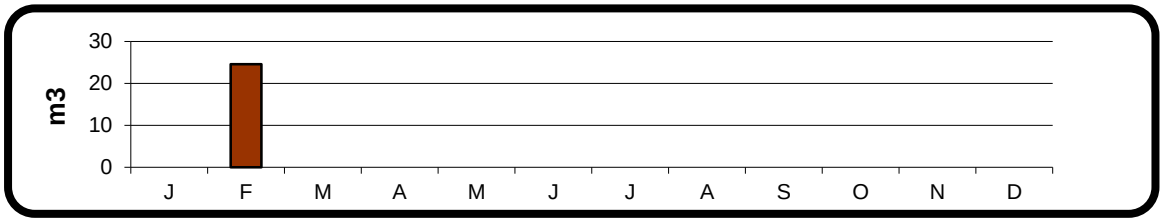
Fig 13. Port Douglas Wastewater Treatment Plant monthly bio-solids production



Mossman Wastewater Treatment Plant

At Mossman Wastewater Treatment Plant, 72.92m^3 of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet biosolids equates to 10.20 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 187 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, short and long term 80th percentile concentrations as per licence definitions and conditions. Mossman WWTP intermittently didn't comply with the dry weather flow limit due to ingress and infiltration into the sewer network.

The process and compliance is monitored each day by in-house analyses of samples at the plants. Process settings, effluent quality, flow rates, pump stations performance and maintenance aspects are monitored and controlled with SCADA Citect via an extensive telemetry network.

Port Douglas Wastewater Treatment Plant

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, and Total Suspended Solids & BOD_5) are shown in Fig 15, 16, 17 & 18

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

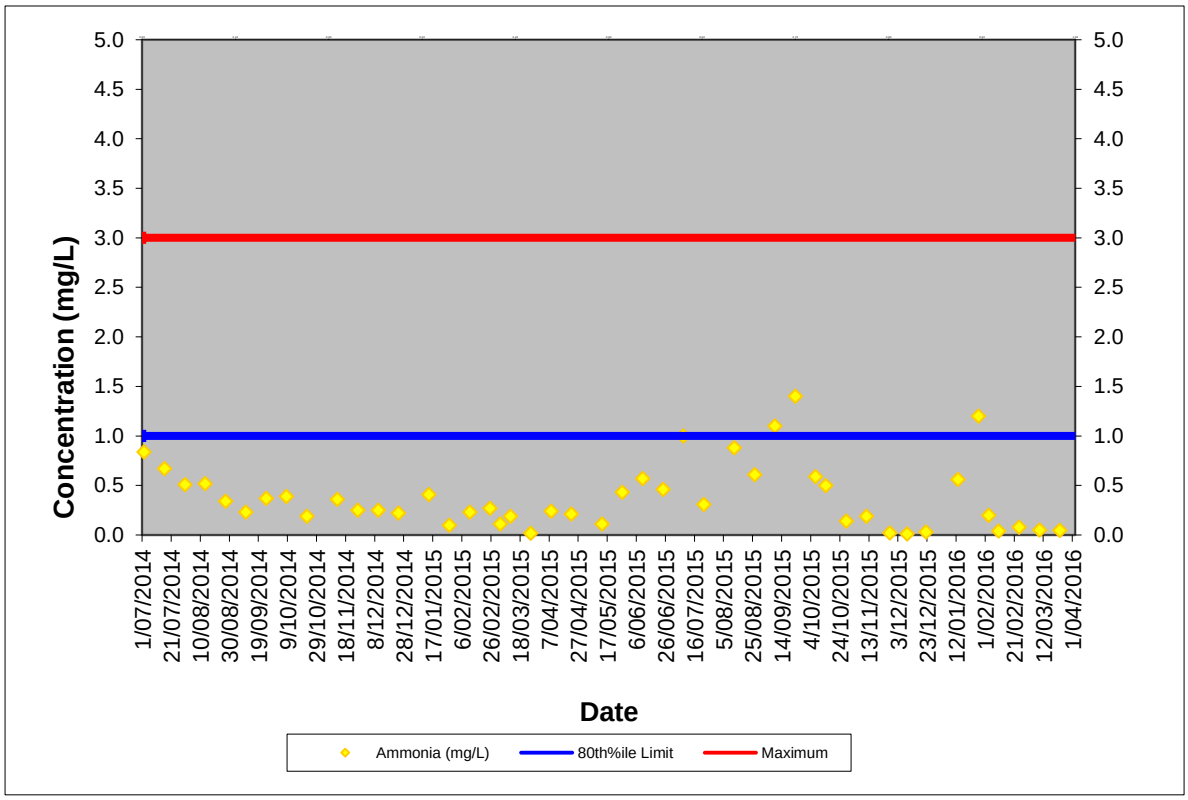


Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous

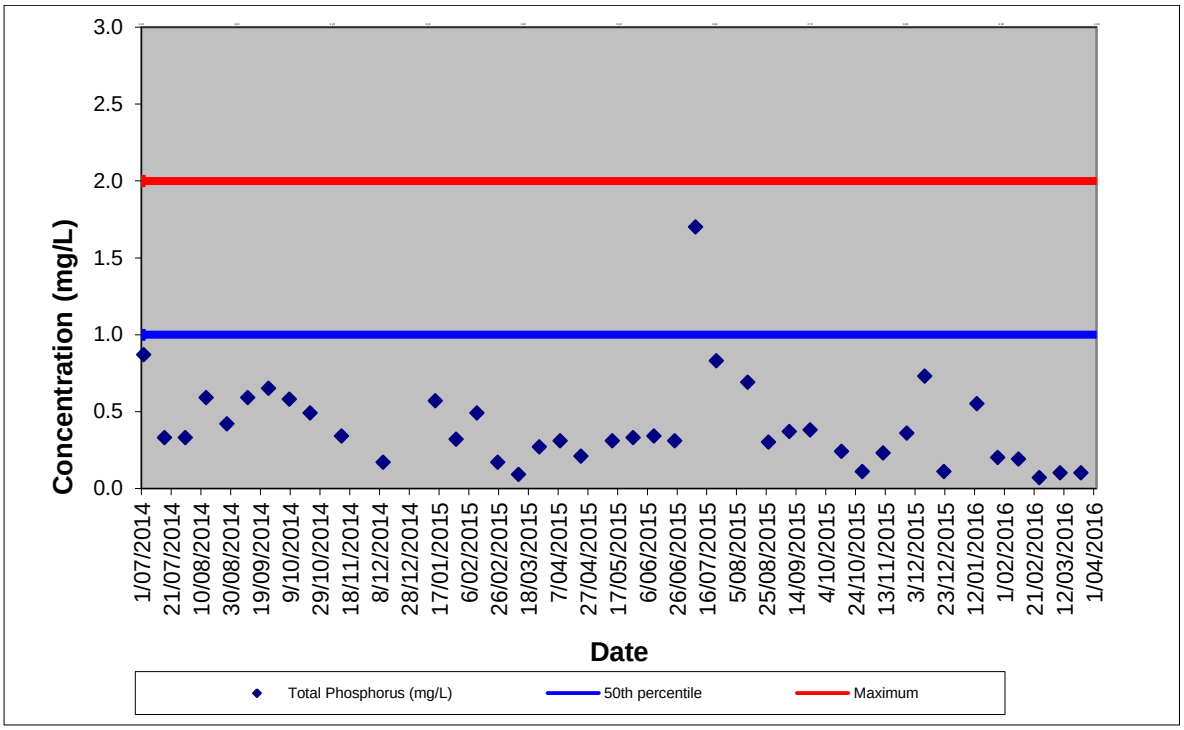


Fig 17. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids

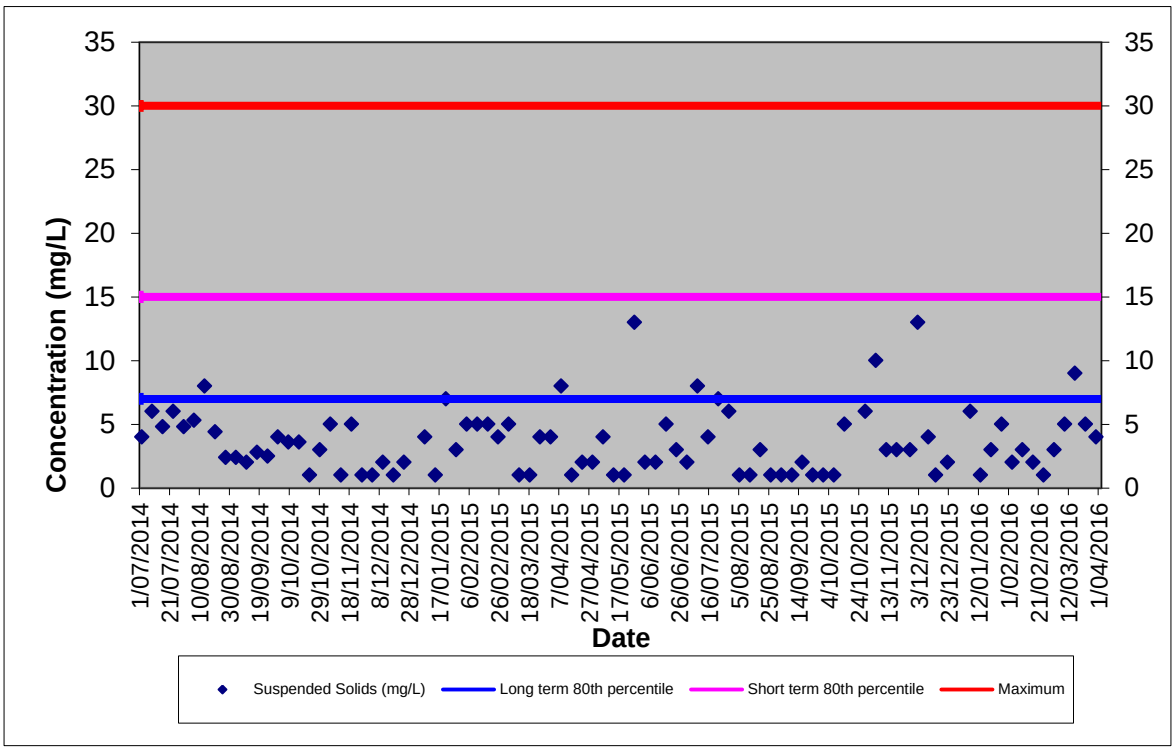
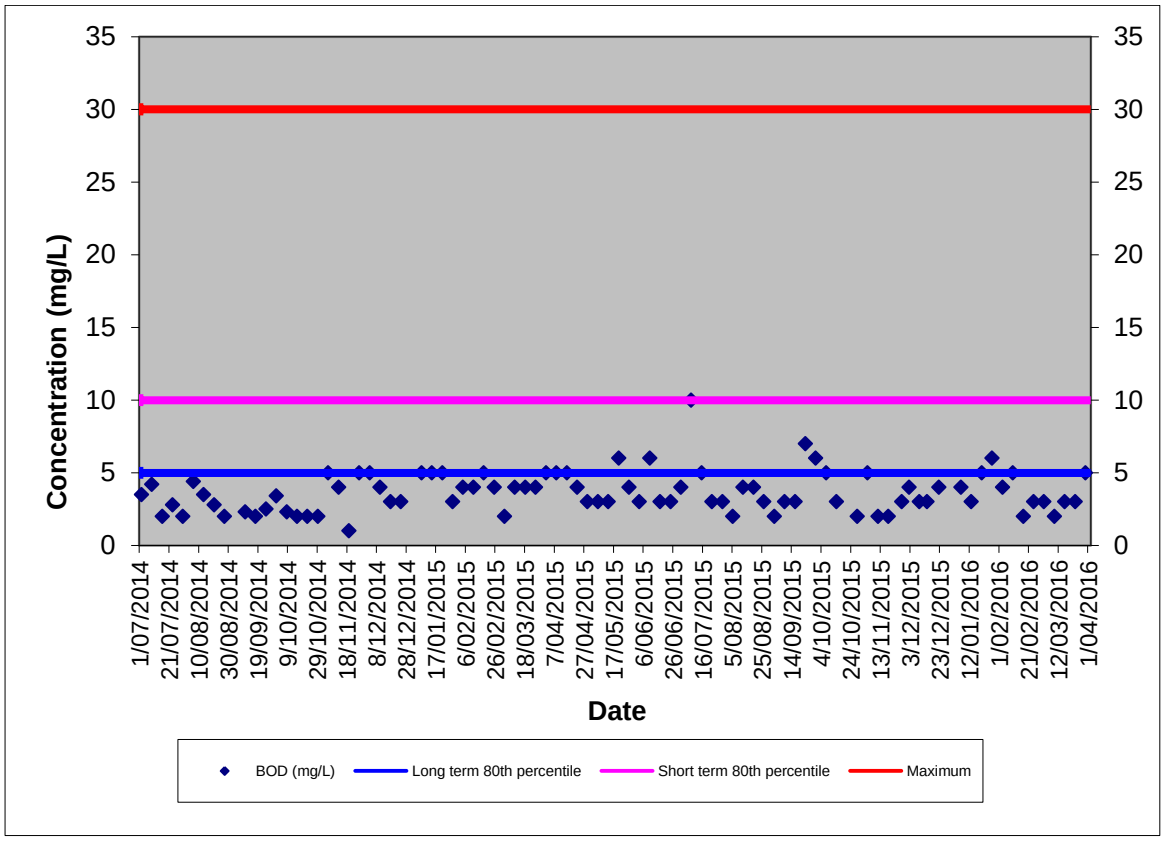


Fig. 18 Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)



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

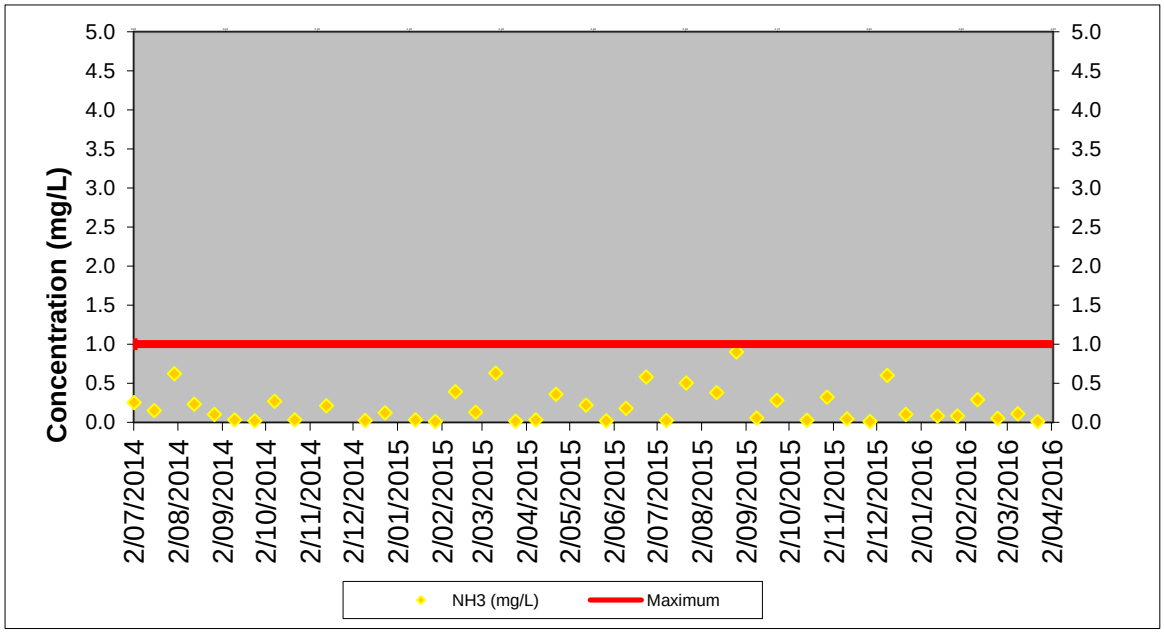


Fig. 20 Mossman WWTP Final Effluent Test Results for Total Phosphorous

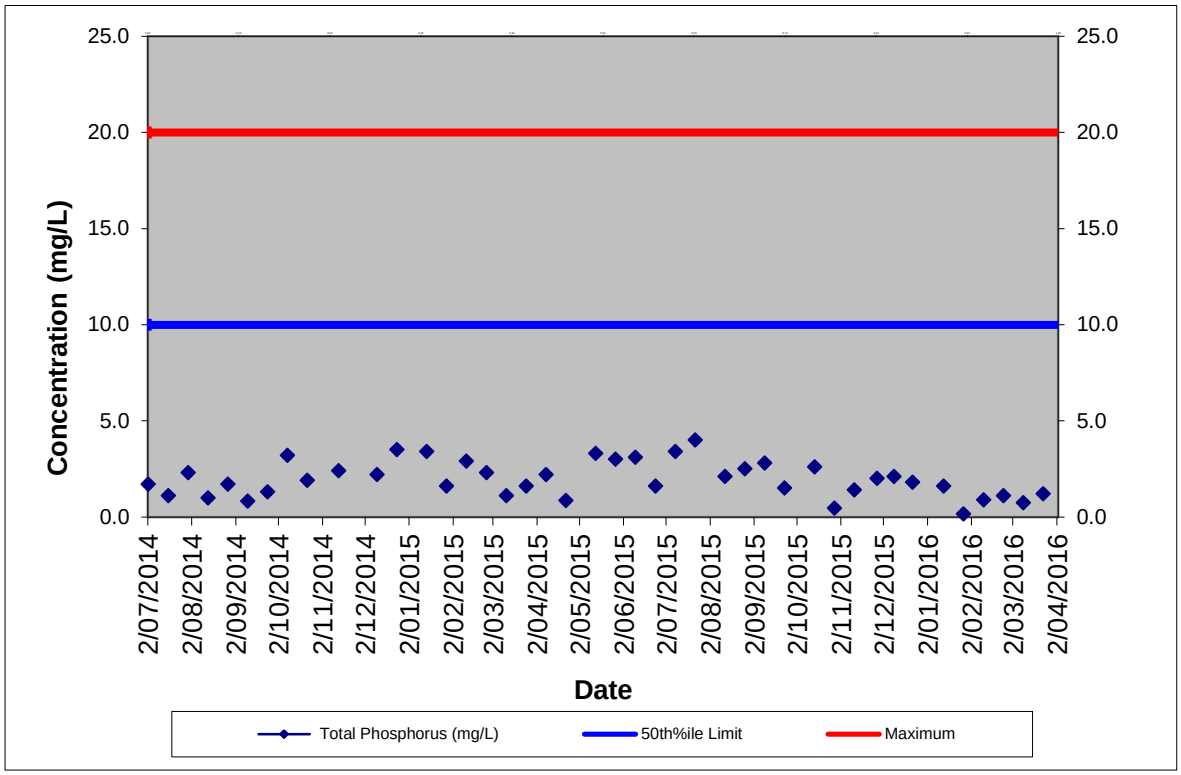


Fig. 21 Mossman WWTP Final Effluent Test Results for Total Suspended Solids

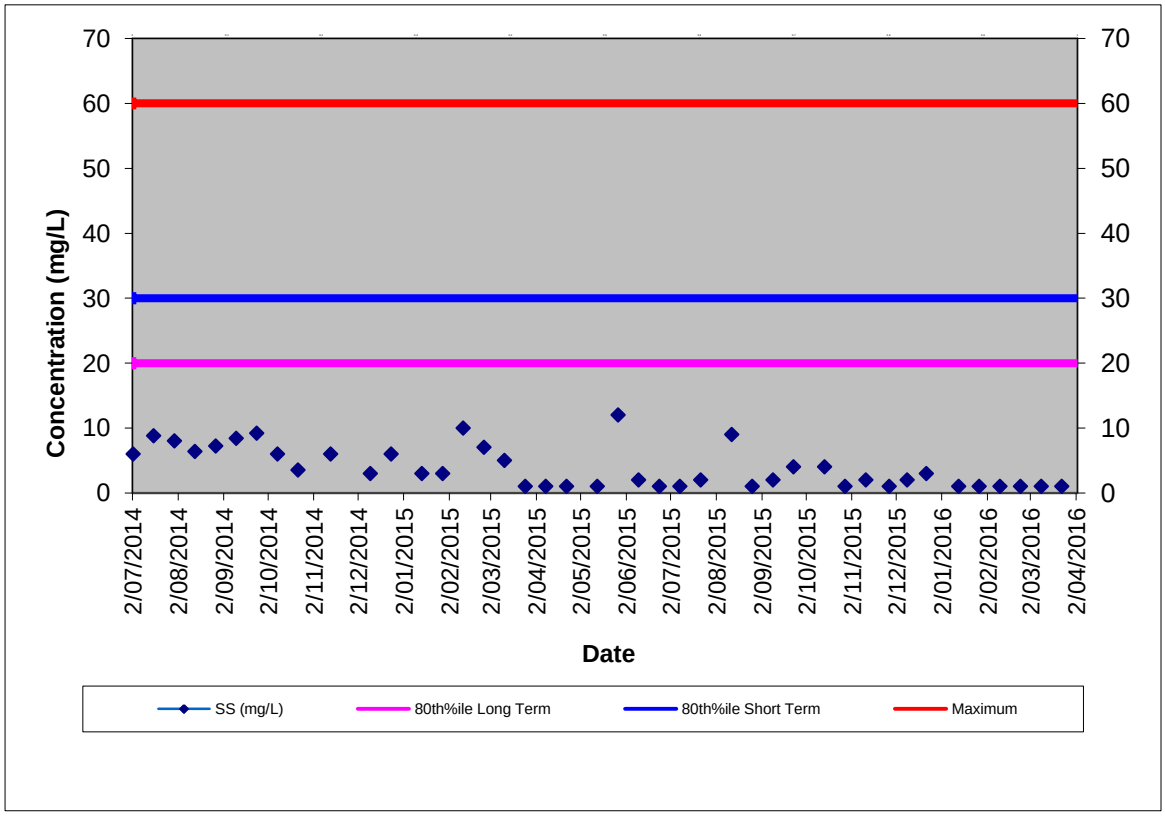


Fig. 22 Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)