ORDINARY MEETING 14 APRIL 2015	5.3

QUARTERLY WATER AND WASTEWATER REPORT
Wouter van der Merwe: Manager Water and Wastewater
Paul Hoye: General Manager Operations

RECOMMENDATION:

That Council receive and note the Quarterly Report of the Water and Wastewater branch for the period ending 31 March, 2015.

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 1 - to March 31,2015.

Whilst the results are generally positive the areas for improvement are noted and will be the focus of the branch over the next quarter. Notable capital improvements include the completion of process and safety improvements at Mossman and Port Douglas Wastewater Treatment Plants (WWTP). At the Port Douglas WWTP, a new gravity drainage deck (GDD) was successfully installed. The GDD is a cost effective and energy efficient way to thicken sludge. The old GDD was in service for 18 years before it became maintenance intensive. The new improved GDD will improve bio-solid handling and deliver a higher percentage bio-solid product and reduce operating and maintenance costs

Old GDD after 18 years of service New GDD installed and fully functional (PDWWTP)

New handrails fitted at Mossman WWTP

BACKGROUND:

This report is the third Quarterly Report submitted by the Water and Wastewater Branch. 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 third 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.

CORPORATE/OPERATIONAL PLAN, POLICY REFERENCE:

Theme 5 Governance, Goal 2:
To demonstrate leadership in local government through sound, transparent, accountable and equitable decision making.

Operational Plan: Water and Waste
Meeting compliance with statutory requirements and licence conditions.

Supplying drinking water and recycled water that meets customer quality requirements and agreed service standards.

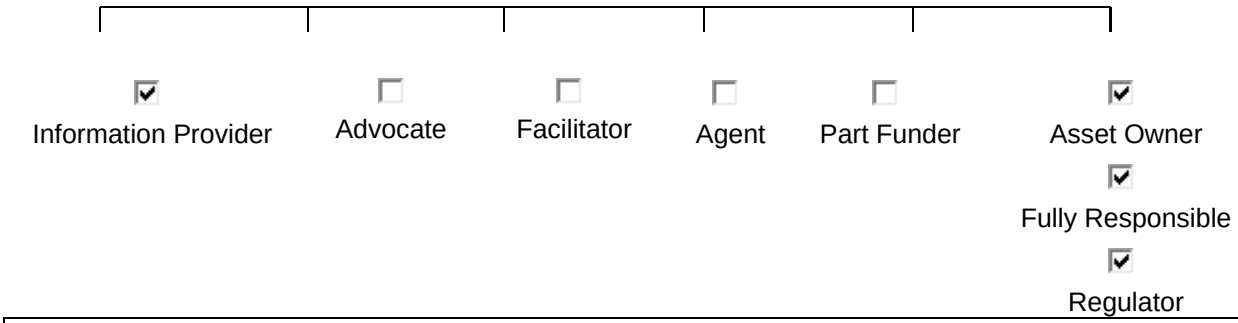
Maintaining Council's Water and Waste assets to ensure maximum lifespan and output capacity in the lifecycle of those assets.

Monitoring of systems, procedures and workplace environments to ensure equipment, plant and machinery is safe to operate and work processes comply with workplace health and safety legislation and standards.

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: Providing access to information to assist communities and organisations.	
Asset Owner:	Meeting the responsibilities associated with owning or being the custodian of assets such as infrastructure.
Fully Responsible:	Funding the full cost of a program or activity.
Regulator:	Meeting the responsibilities associated with regulating activities through legislation or local law.

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 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.

INTERNAL/EXTERNAL CONSULTATION:

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.

ATTACHMENTS:

Water and Wastewater Quarterly Report for the period ending 31 March 2015.

Attachment 1 - Water and Wastewater Quarterly Report
1 January 2015 - 31 March 2015

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 as these are the subject of 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	92
New water services connections	12
Service repairs	96
Water mains repairs	0
Callouts and breaks	22
Water Quality Complaints	4

Table 2 Water Complaints

Address	CRM Number and Date	Nature of water complaint	How was it resolved	Response Time
40 Johnstone Rd Mossman	CRM5696; 4/02/15	Metallic Tasting Water	Flushed hydrants and dead end mains in the area and at meter/ boundary. Chlorine residual: 0.67mg/l after flushing. Water was clear and cold with no obvious metallic taste at the boundary.	1hr20mins
13 Billfish Close Wonga Beach	CRM5758; 24/02/15	Strong Chlorine Taste	Flushed all hydrant points in the immediate area and at the meter, at first water was warm due to high day time temperatures. After flushing water was cooler and clear. Chlorine residual: low, 0.07mg/l with very little chlorine taste and smell. Carried out further flushing in the Wonga area as a precaution.	1hr00mins

5 Camelia Close Wonga Beach	CRM5801; 27/02/15	Strong Chlorine Taste	Flushed the immediate area and at meter/boundary. Afterwards Chlorine residual was 0.1mg/l with no obvious chlorine smell or taste.	5 mins– Callout
5-Orchid Ave Rocky Point Views	CRM5902; 10/03/15	Strong Chlorine Taste	Flushed all hydrant points in the Port Views area and at the meter/boundary. Afterwards Chlorine residual was 1.15mg/l and water was clear at low temperature.	35 mins

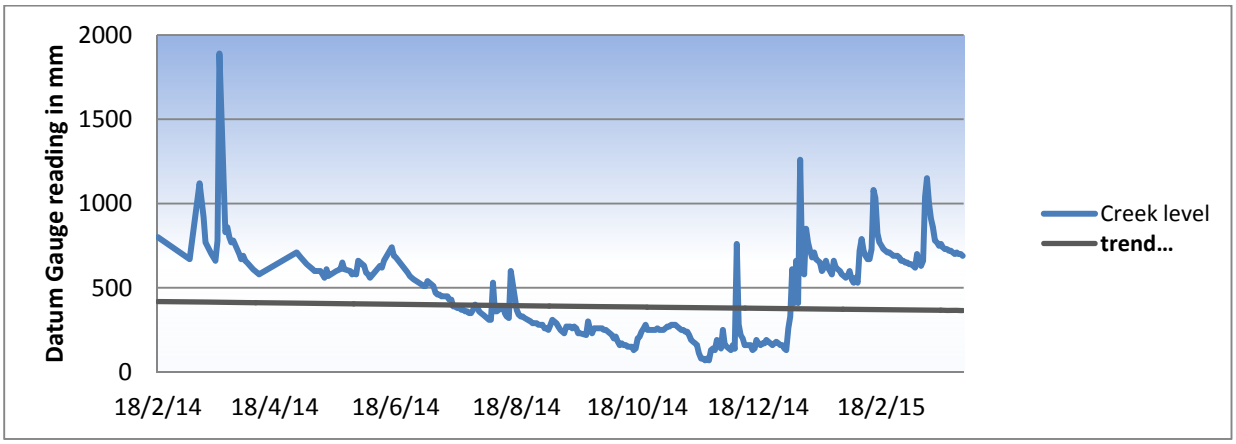
2. Water schemes and potable water consumption

Intake stream water levels have increased significantly following wet season rains with prolonged surface run off ensuring a good stable supply of raw water in all intakes. The wet season rains have also resulted in a number of flooding and turbidity events in all intakes. Stream levels have increased upwards as a result of flash flooding, with large amounts on sand and debris washing into the intakes. There have been a number of plant outages that have presented challenges for the operations team in supplying adequate and safe water to the Shire.

Mossman/Port Douglas Schemes
Stable intake levels with reduced seasonal consumption have ensured adequate water supplies for the Shire over the reporting period.

Rex Creek intake level had adequate capacity to meet maximum extraction flows of >200L/s (See Rex Creek level in Fig 1). The intake level trend indicates a “dry” wet season for the region.

Fig 1. Rex Creek Intake Level in 2014 and 2015



Mossman water treatment plant is meeting demand capacity. From January 2015 to March 2015 the total consumption for the Mossman and Port Douglas scheme has steadily decreased on average by 27% on the previous quarter, which is in line with 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 3 shows the daily water consumption in Mossman, Cooya Beach and Newell Beach areas during March 2015.

Fig 2. Mossman Scheme Monthly Consumption figures

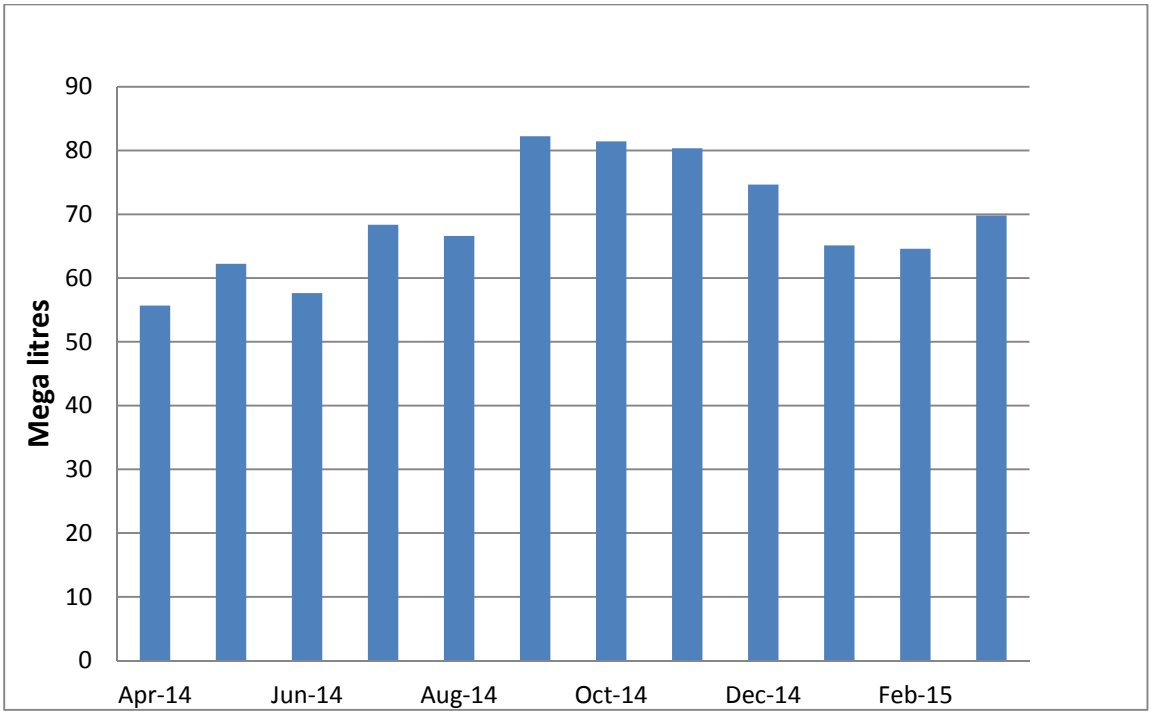
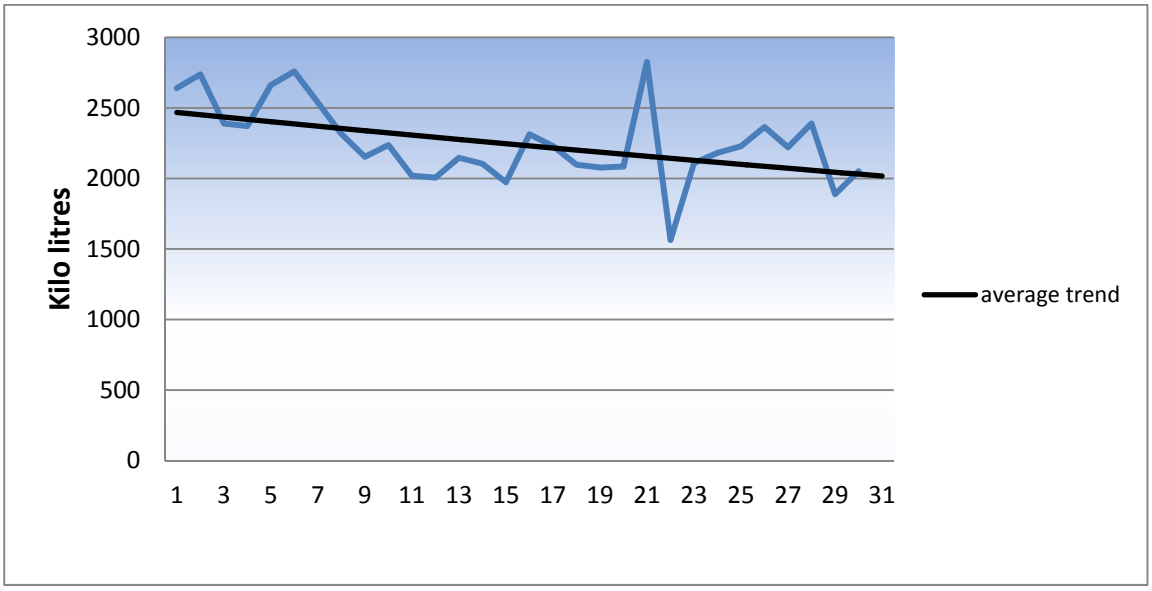


Fig 3. Mossman Scheme Daily Consumption during March 2015



Port Douglas Water Supply
The total monthly consumption of water in Port Douglas can be seen in Fig 4.

Fig 5 shows the daily water consumption in the Port Douglas scheme during March 2015.

Fig 4. Port Douglas Scheme Monthly Consumption figures

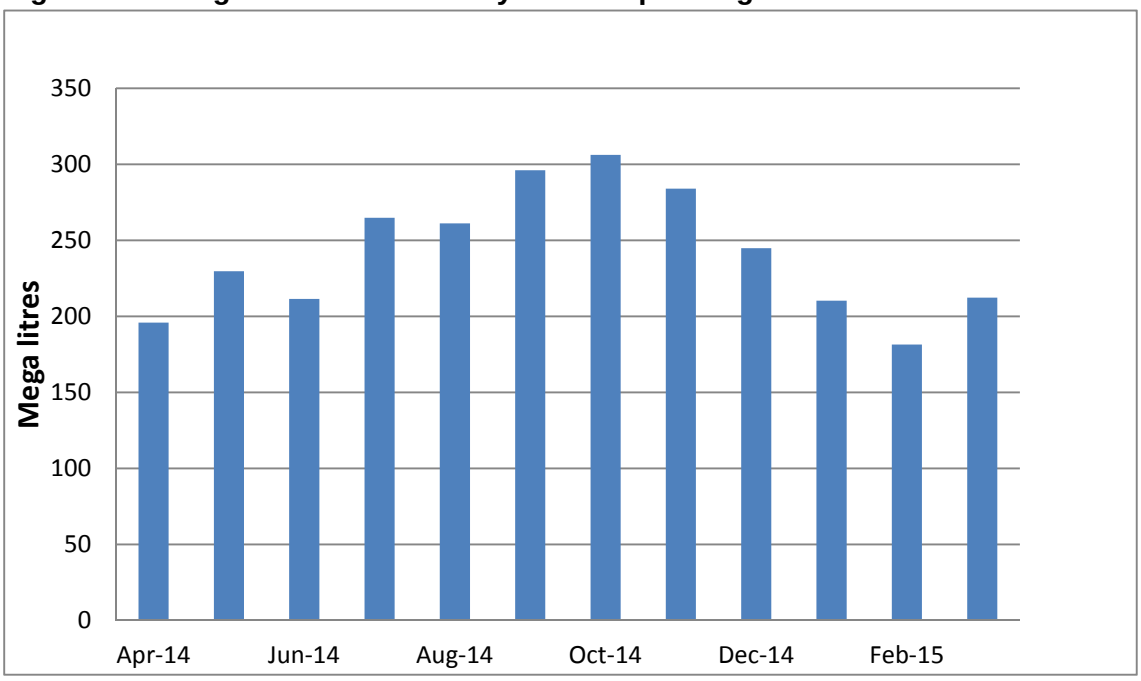
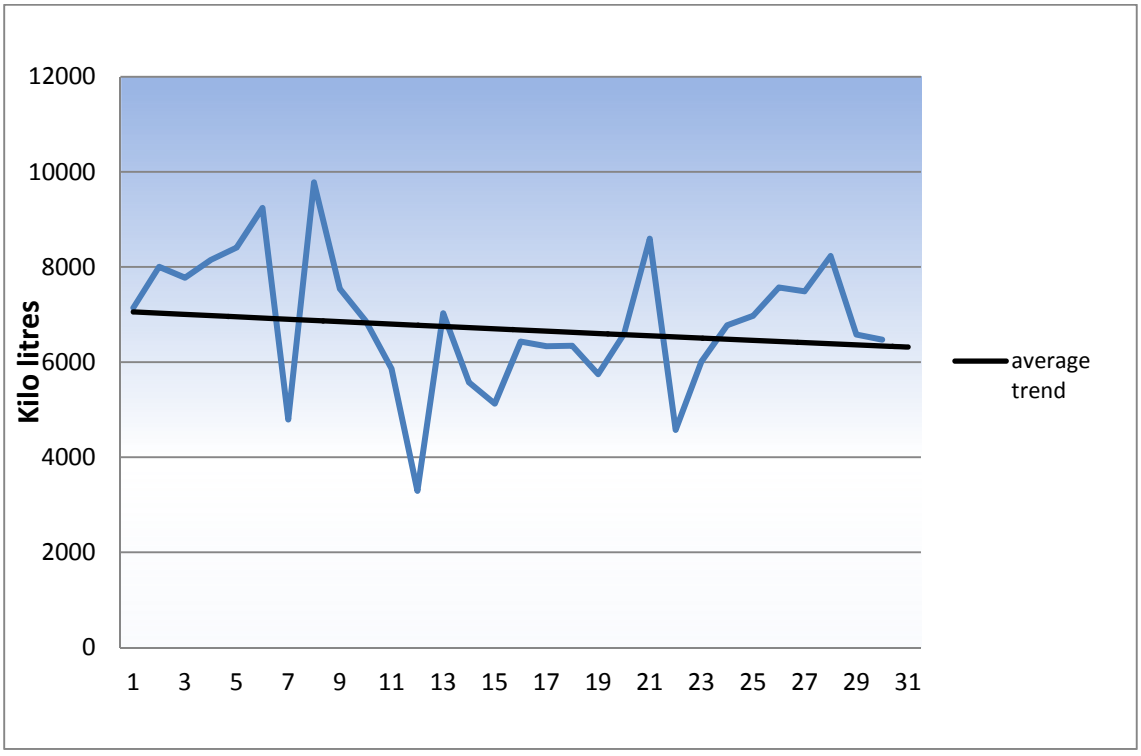


Fig 5. Port Douglas Scheme Daily Consumption during March 2015



Whyanbeel Scheme

Whyanbeel plant is operating and meeting demand. Intake levels at Little Falls creek have increased with wet season rains and are adequate for full plant production capacity. From January 2015 to March 2015 the total consumption for the Whyanbeel scheme has decreased on average by 20 % on the previous quarter. Consumption for this scheme has decreased in line with seasonal trends.

Whyanbeel Water Supply

The total monthly consumption of water in the Whyanbeel Scheme can be seen in Fig 6 and Fig 7 shows the daily water consumption in the Whyanbeel Scheme during March 2015.

Fig 6. Whyanbeel Scheme Monthly Consumption figures

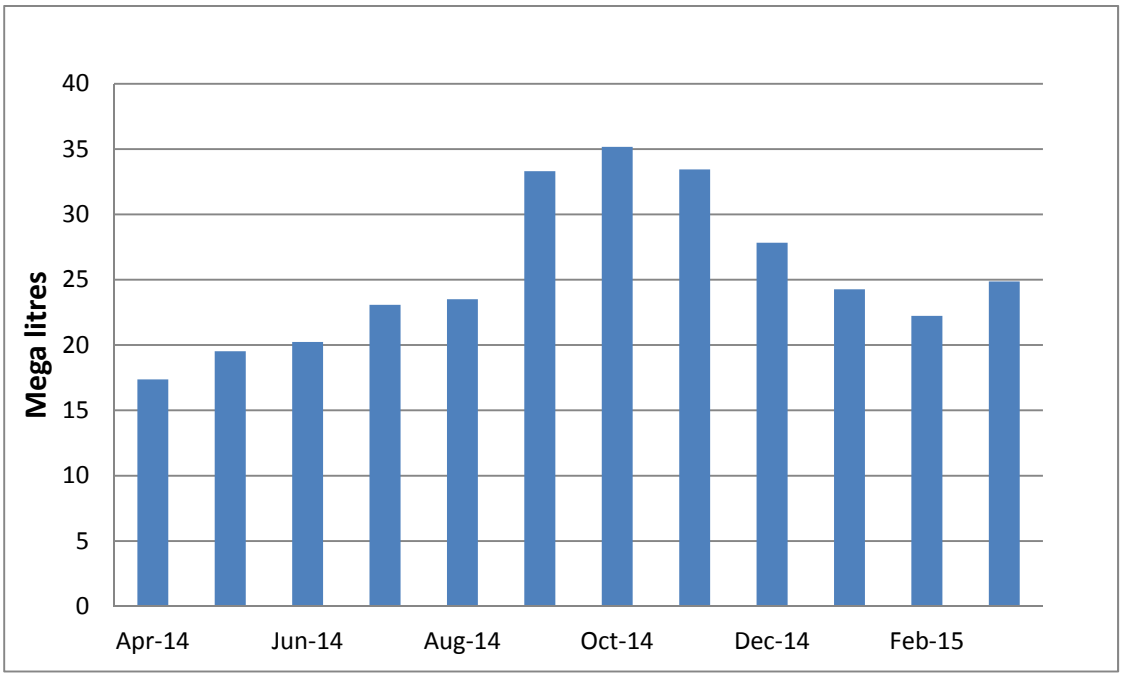
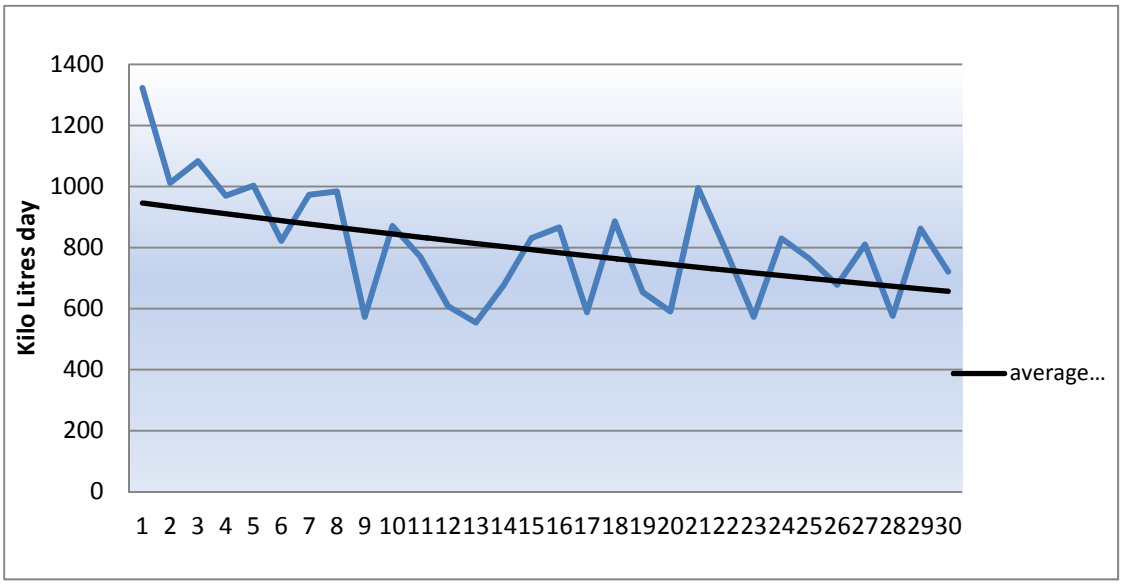


Fig 7. Whyanbeel Daily Consumption during March 2015



Daintree Scheme

Daintree plant is operating and meeting demand. Intake levels at Intake Creek have increased with wet season rains and are adequate for full plant production capacity. From January 2015 to March 2015 the total consumption for the Daintree scheme has increased by 6% on the previous quarter.

Daintree Water Supply

The total monthly consumption of water in the Daintree Scheme can be seen in Fig 8 and Fig 9 shows the daily water consumption in the Daintree Scheme during March 2015.

Fig 8. Daintree Scheme Monthly Consumption figures

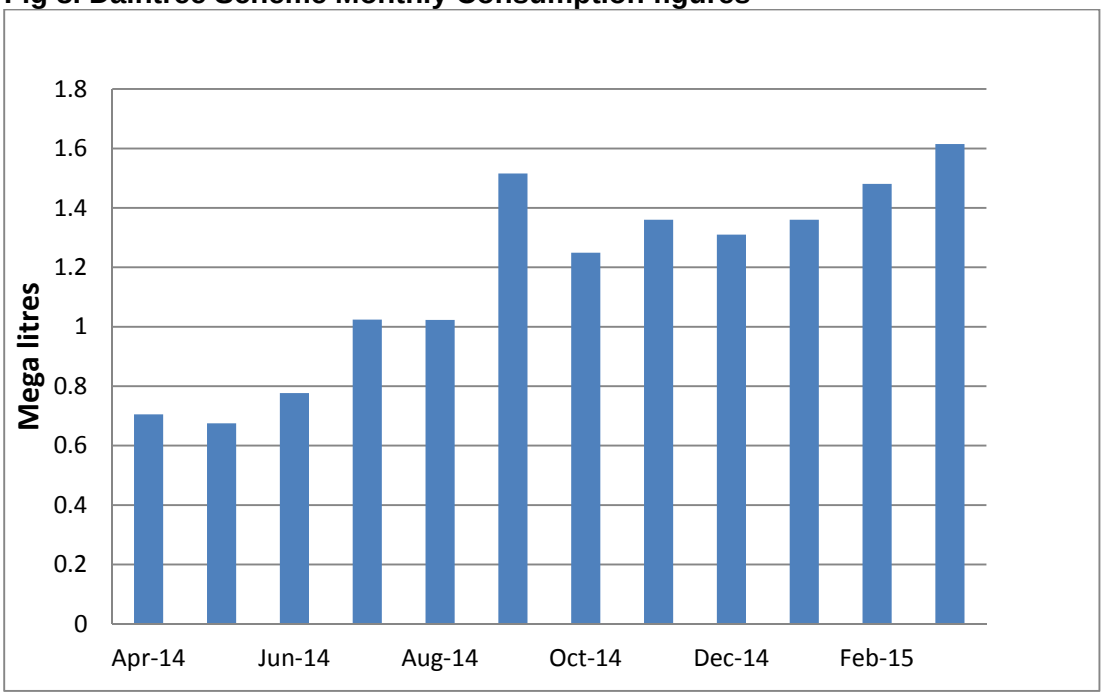
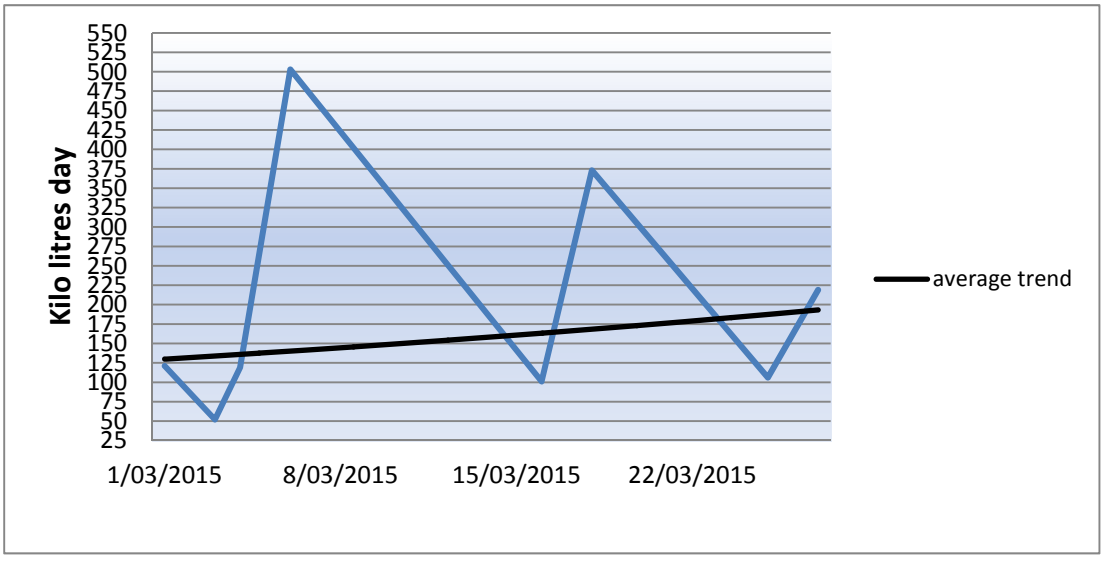


Fig 9. Daintree Daily Consumption during March 2015



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 to 31 March 2015, a total of 323 water samples were taken in the 4 water supply schemes. A total of 162 samples were tested in the Douglas Water Laboratory and 161 samples were tested by a NATA accredited laboratory for physical, chemical and microbiological parameters. Of these 323 water samples, 188 samples were taken from the public reticulation network, 40 at reservoirs and 95 were samples taken at the treatment process. All tested parameters in water samples taken during the reporting period were compliant with ADW Guidelines.

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 10 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/100 ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
Jan-15	7.55	24.23	8	0.92	1.03	<1	<2	<1
Feb-15	7.46	23.75	5	0.99	1.03	<1	<2	<1
Mar-15	7.53	23.5	5.5	0.73	0.91	<1	<1	<1

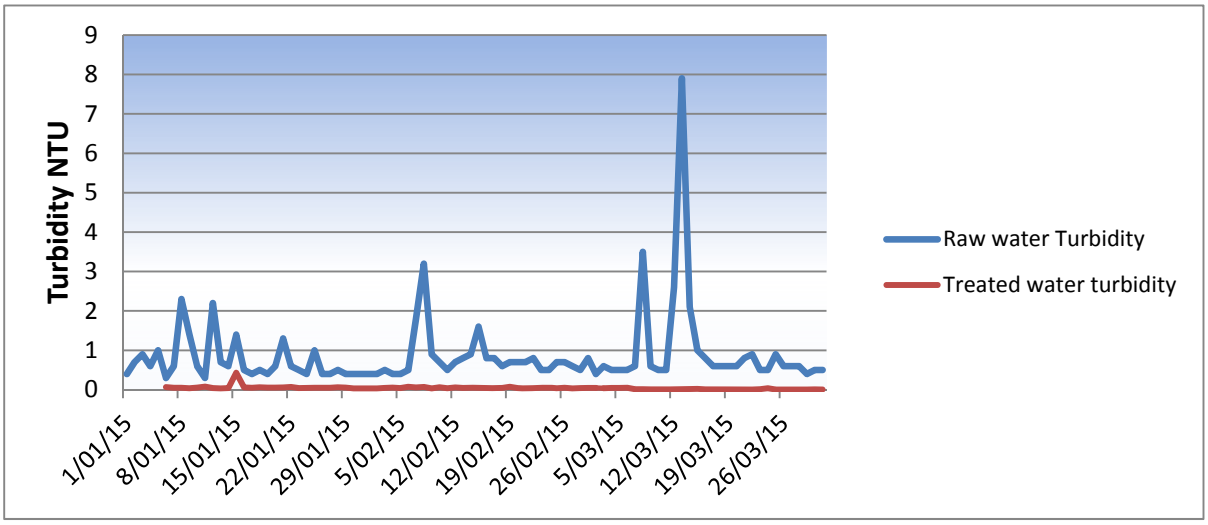
Table 4. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/100 ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
Jan-15	7.75	25.58	11.5	0.64	0.73	<1	<4	<1
Feb-15	7.99	26.79	7	0.69	0.73	<1	<2	<1
Mar-15	7.82	26.02	9	0.82	0.88	<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	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/100 ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
Jan-15	8.09	28.08	na	0.29	0.33	<1	<32	<1
Feb-15	8.20	26.79	na	0.40	0.44	<1	<4	<1
Mar-15	8.08	26.02	na	0.48	0.56	<1	<3	<1

Fig 10. Turbidity trends at the Rex Creek intake and treated water at the Mossman WTP



Whyanbeel Supply Scheme

Average monthly values for key operational and compliance parameters can be seen In Table 6, 7 and 8 for treated water at the Whyanbeel Treatment Plant, Whyanbeel Reservoir and Whyanbeel Reticulation network, respectively. Fig 11 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 2015.

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/100 ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
Jan-15	7.12	24.2	7	0.94	1.03	<1	<1	<1
Feb-15	7.23	25.1	5	0.89	0.94	<1	<1	<1
Mar-15	7.16	23.93	5	0.86	0.95	<1	<1	<1

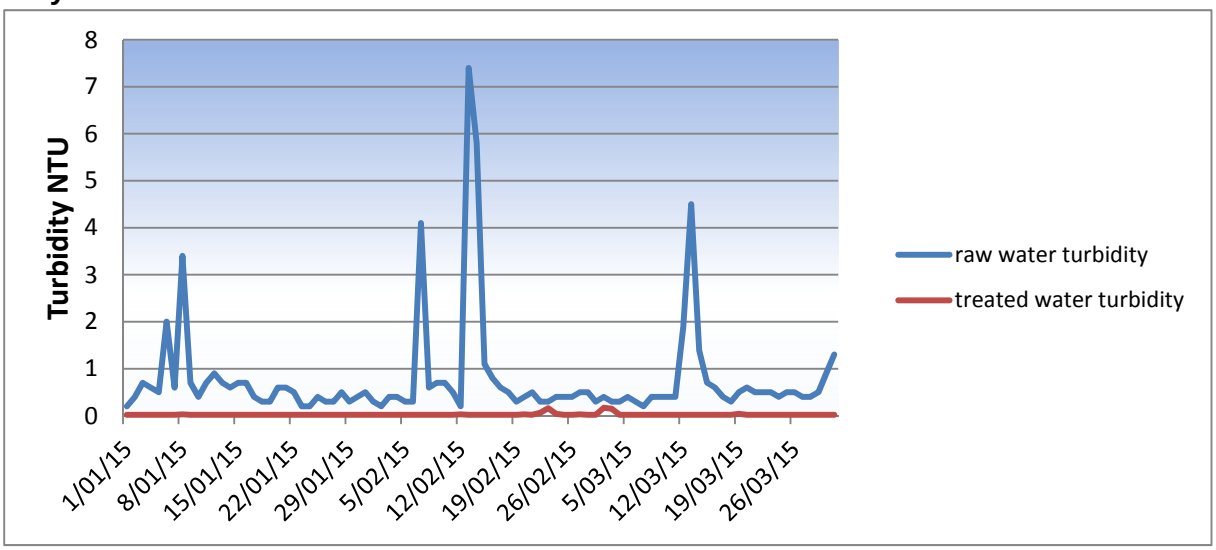
Table 7. Average monthly values for key operational and compliance parameters in the Whyanbeel Reservoir.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/100 ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
Jan-15	7.12	27.03	11	0.45	0.55	<1	<1	<1
Feb-15	7.26	27.83	8	0.73	0.81	<1	<1	<1
Mar-15	7.34	28.17	9	0.78	0.84	<1	<1	<1

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

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/100 ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
Jan-15	8.02	28.16	na	0.12	0.15	<1	200+	<1
Feb-15	8.14	28.69	na	0.3	0.34	<1	<23	<1
Mar-15	8.32	29.39	na	0.46	0.55	<1	<1	<1

Fig 11. Turbidity trends at the Little Falls Creek intake and treated water at the Whyanbeel WTP



Daintree Supply Scheme

Average monthly values for key operational and compliance parameters can be seen In Table 9 and 10 for treated water at the Daintree Treatment Plant and Daintree Reticulation network, respectively. Fig 12 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 2015.

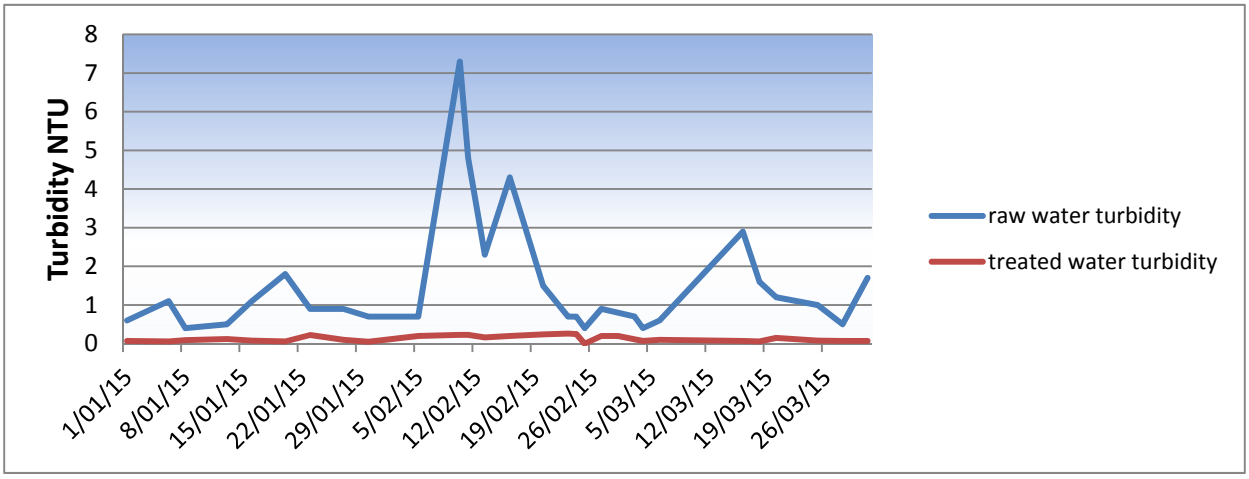
Table 9. Average monthly values for key operational and compliance parameters in treated water at Daintree treatment plant.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/100 ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
Jan-15	7.55	26.2	23	0.47	0.55	<1	<1	<1
Feb-15	7.29	27.25	20	0.46	0.53	<1	<2	<1
Mar-15	7.23	27.07	17	0.33	0.37	<1	<1	<1

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

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/100 ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
Jan-15	7.54	26.5	na	0	0.01	<1	<130	<1
Feb-15	7.47	27.53	na	0.03	0.07	<1	<37	<1
Mar-15	7.41	28.03	na	0.01	0.04	<1	300+	<1

Fig 12. Turbidity trends at the Intake/Martin Creek intake and treated water at the Daintree WTP



Wastewater

4. Wastewater Reticulation Services

General maintenance was carried out at all 31 sewage pump stations and reticulation networks in the Mossman and Port Douglas catchments. All generators fully maintained and inspected for the cyclone season.

Capital projects are progressing well and in particular the process and safety improvements at Mossman WWTP. Contractors have installed the new waste activated sludge (WAS) and return activated sludge (RAS) lines and these alterations will relieve hydraulic pressure on the clarifier tank. Contractors have removed 130m^3 of accumulated sand from the Mossman oxidation ditch thereby increasing the treatment capacity of the oxidation ditch with 18%. The sand is carted away to Springmount Waste Facility by the bio-solids contractor. The installation of the safety rails is now completed.

At the Port Douglas WWTP, the new gravity drainage deck (GDD) was successfully installed and commissioned. The GDD is a cost effective and energy efficient way to thicken sludge. The old GDD was in service for 18 years before it became maintenance intensive. The new improved GDD will improve bio-solid handling and deliver a higher percentage bio-solid product.

Table 11. Wastewater Reticulation Services

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

Odour complaint:
Ongoing complaint at 2-4 Alchera Drive, Mossman, opposite Sewer Pump Station MB; Lids sealed at pump station. Contractor carried out smoke test and found sewer in satisfactory condition.

5. Influent and Irrigation Flows

Port Douglas WWTP
A total of 368,304 kL of influent entered the Port Douglas wastewater plant during the reporting period. The average daily flow was 3,116 kL/d. Tanker truck contractors delivered 588 kL of septage to the plant. Influent is treated in a Sequencing Batch Reactor (SBR) and produced compliant effluent during the reporting period. A total of 44% of the treated effluent was pumped to two resorts and the remaining discharged in the Dickson Inlet. The Sheraton Mirage received 49,613 kL and Reef Links received 72,476 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 1057 mm. Daily SBR flows and total monthly flows for 2014/2015 are presented in Fig 13 and 14 respectively.

Fig 13. Port Douglas SBR Daily Flow

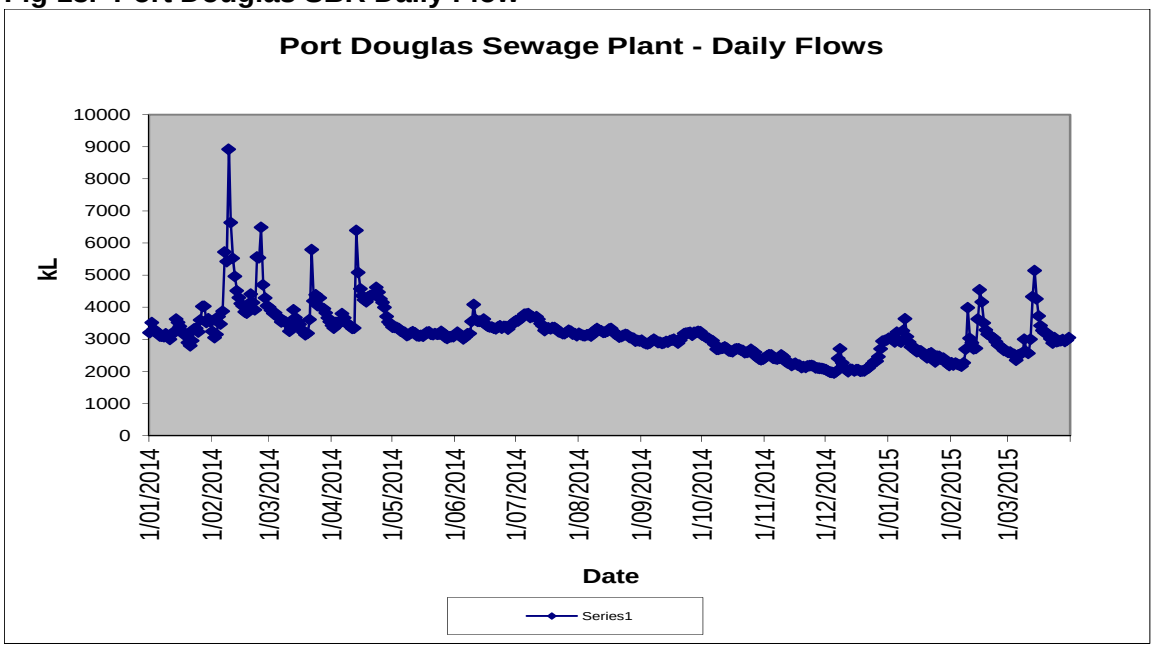
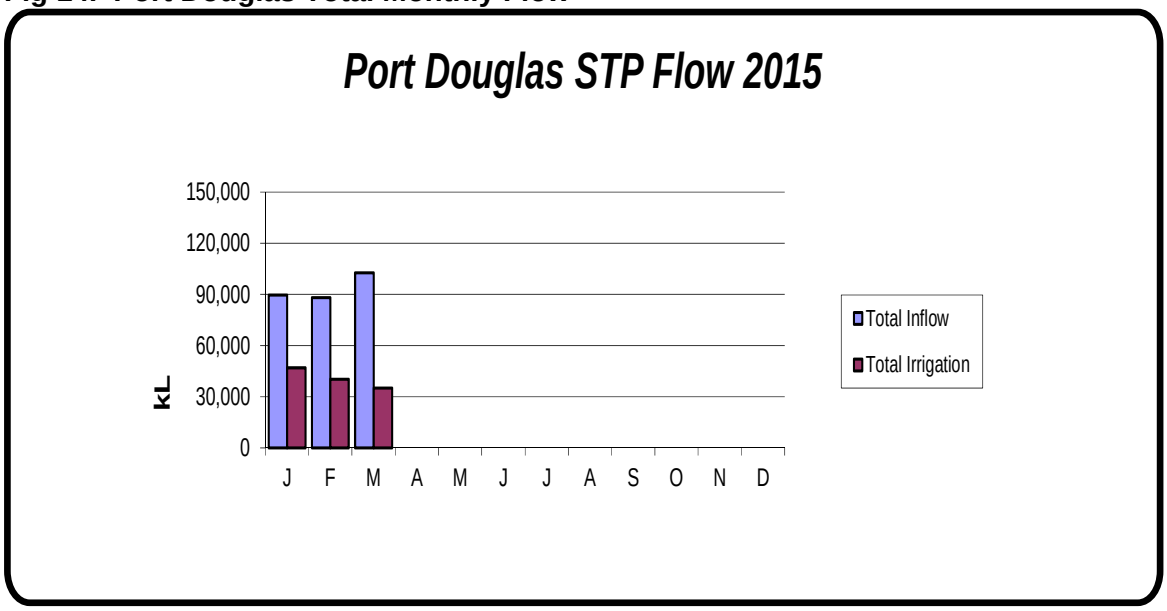


Fig 14. Port Douglas Total Monthly Flow



Mossman WWTP

The Mossman wastewater plant received a total influent flow of 106,471 kL during the reporting period. The average daily flow was 1189 kL/d. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged in the Mossman River. Total rainfall on site during the reporting period was measured as 1042 mm with the highest daily rainfall measured as 145 mm on 12 March 2015.

Daily flows from the Mossman treatment plant and total monthly flows for 2015 are presented in Fig 15 and 16 respectively.

Fig 15. Mossman wastewater treatment plant Daily Flow

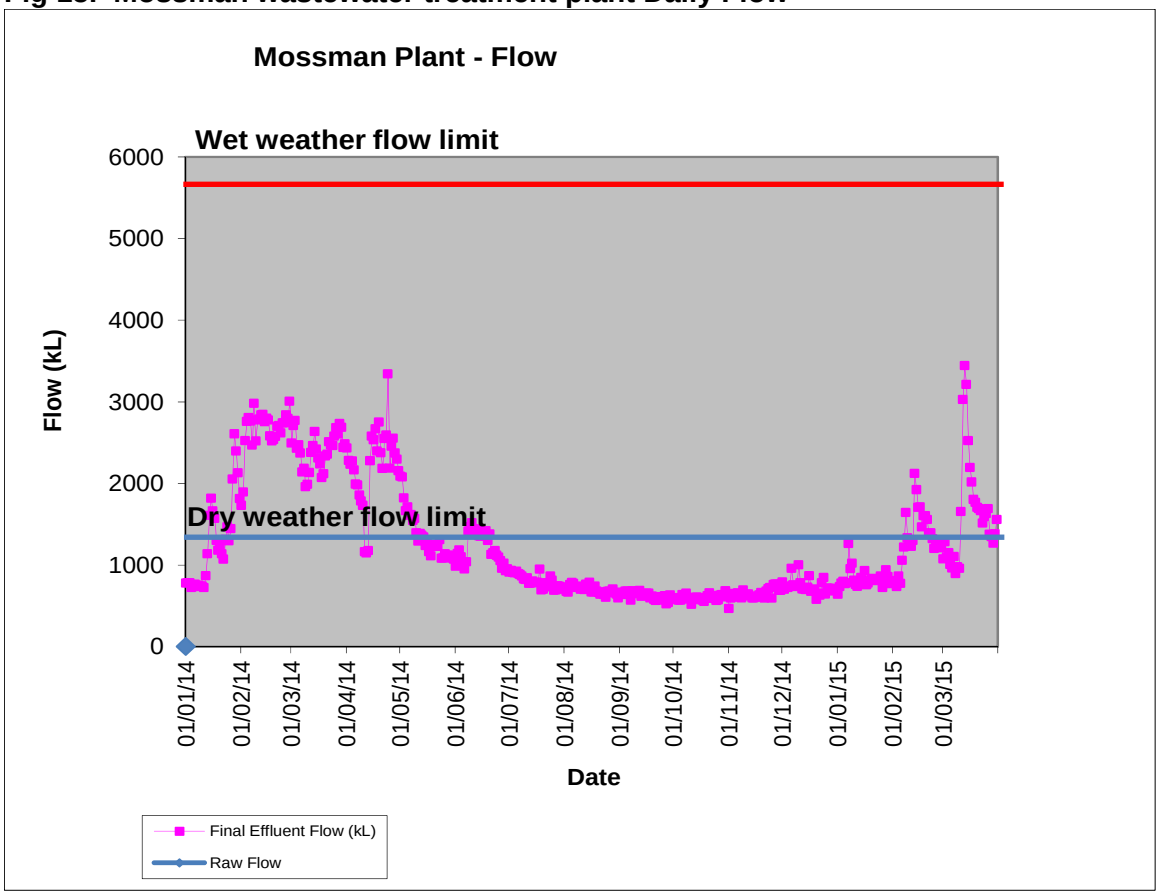
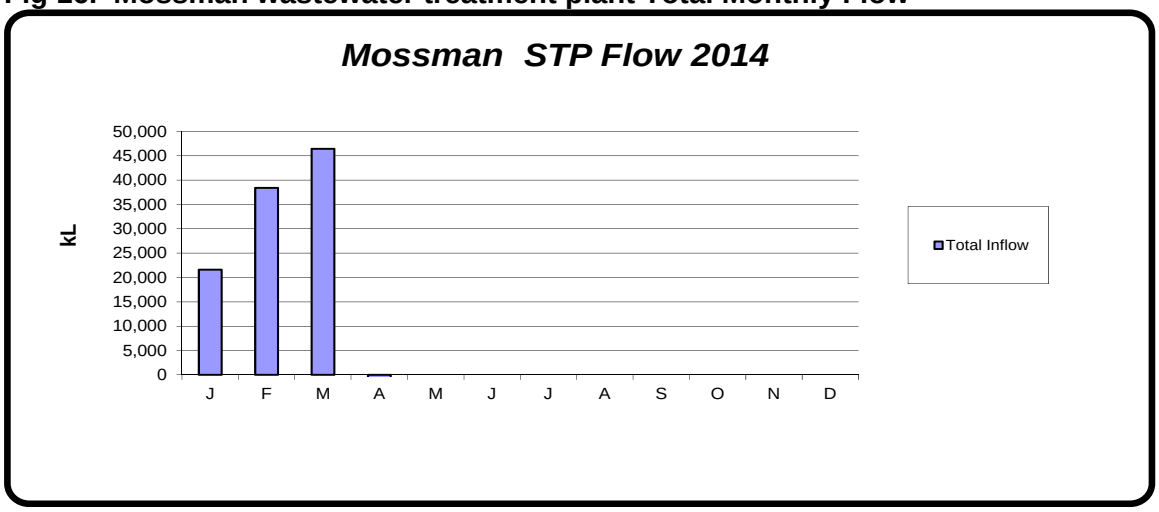


Fig 16. Mossman wastewater treatment plant Total Monthly Flow



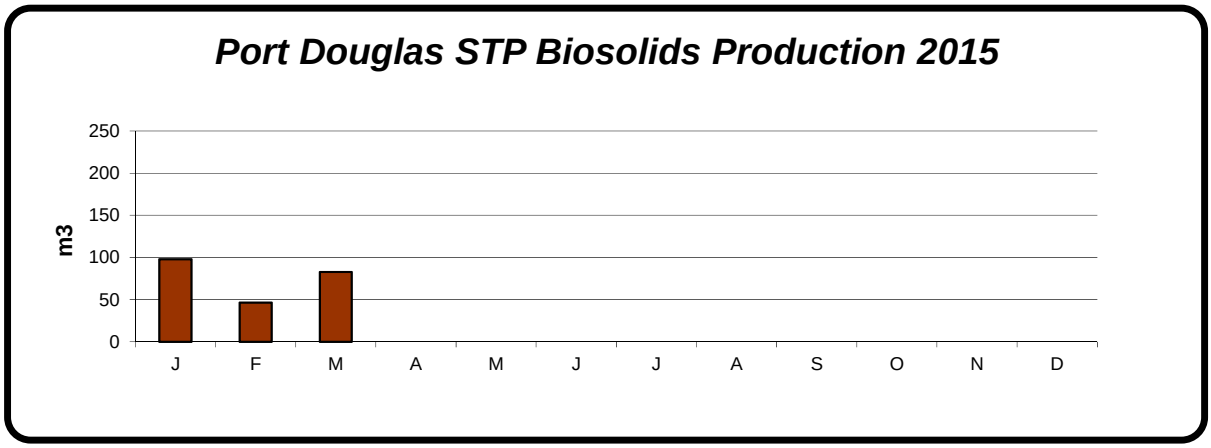
6. Bio-solids Production

Bio-solids were produced at the dewatering plants at Mossman WWTP (18% solids) and Port Douglas WWTP (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 WWTP

At Port Douglas WWTP, 31.78 dry tons (202.68m^3) of bio-solids were produced during the reporting period. The monthly bio-solids production trends can be seen in Fig 17.

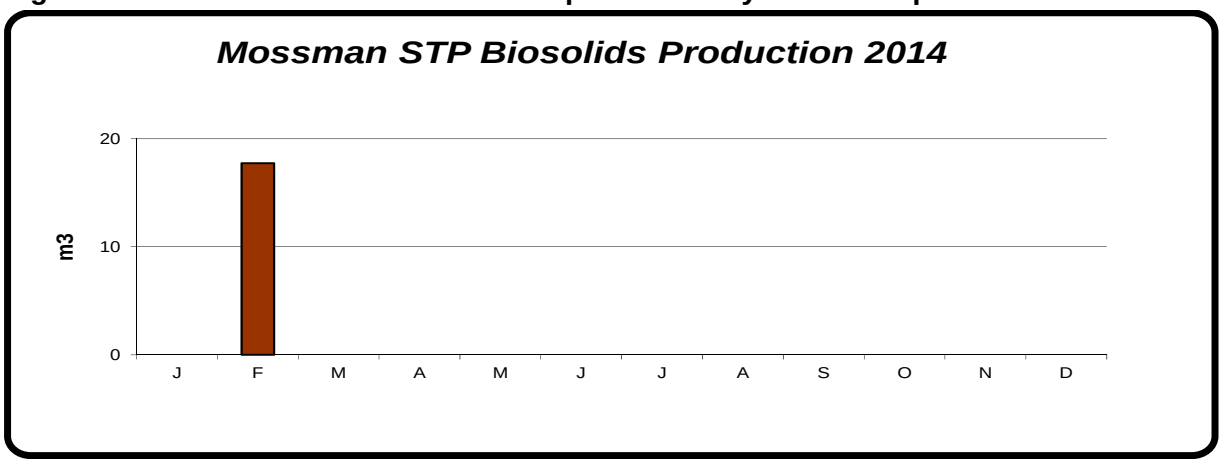
Fig 17. Port Douglas wastewater treatment plant monthly bio-solids production.



Mossman WWTP

At Mossman WWTP, 2.4 dry tons (17.74.m^3) of bio-solids were produced during the reporting period. The monthly bio-solids production trends can be seen in Fig 18.

Fig 18. Mossman wastewater treatment plant monthly bio-solids production.



7. Effluent Quality and Compliance

During the reporting period a total number of 163 wastewater compliance samples were taken from the treatment processes, bio-solids, final effluent, receiving waters and bores in both wastewater catchments. Samples were tested by a NATA accredited laboratory for physical, chemical and microbiological parameters.

All parameters tested in the Port Douglas and Mossman catchment were compliant with licence conditions during the reporting period.

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 WWTP

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, and Total Suspended Solids & BOD) are shown in Fig 19, 20, 21 & 22.

Fig 19. Port Douglas WWTP Final Effluent Test Results for Ammonia

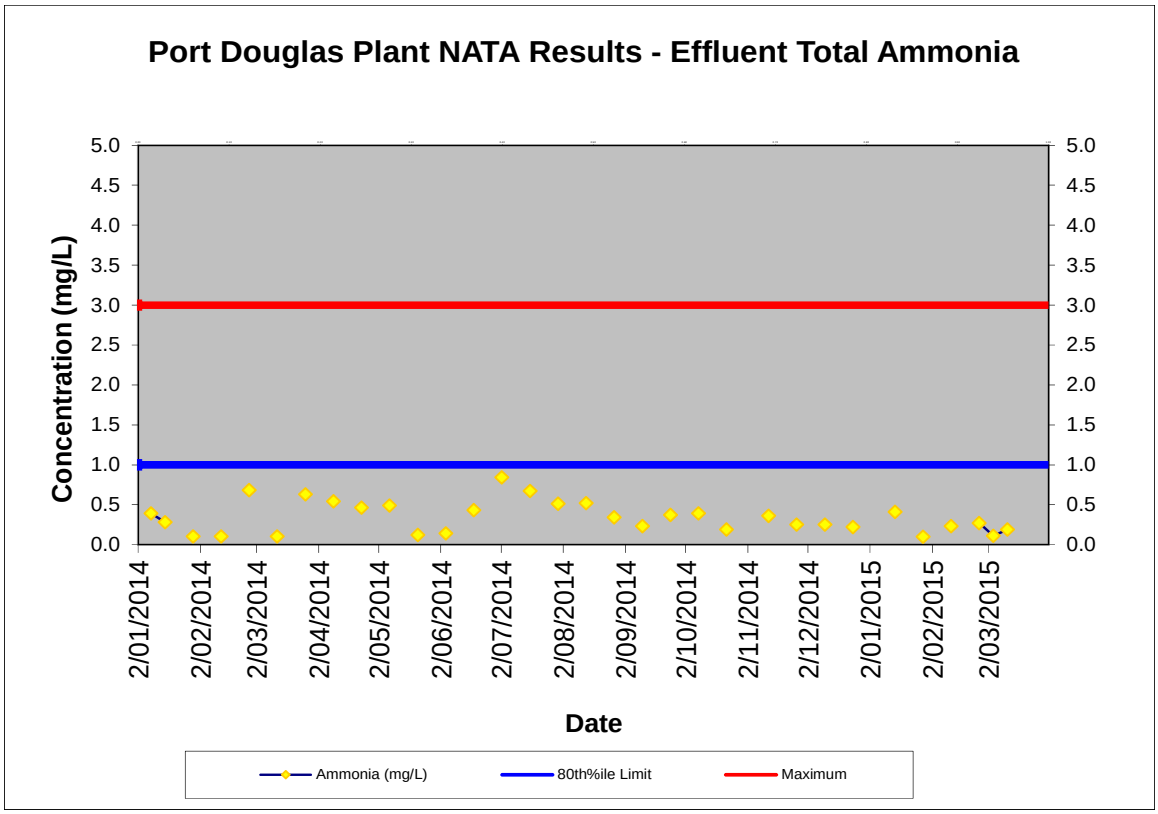


Fig 20. Port Douglas WWTP Final Effluent Test Results for Total Phosphorous

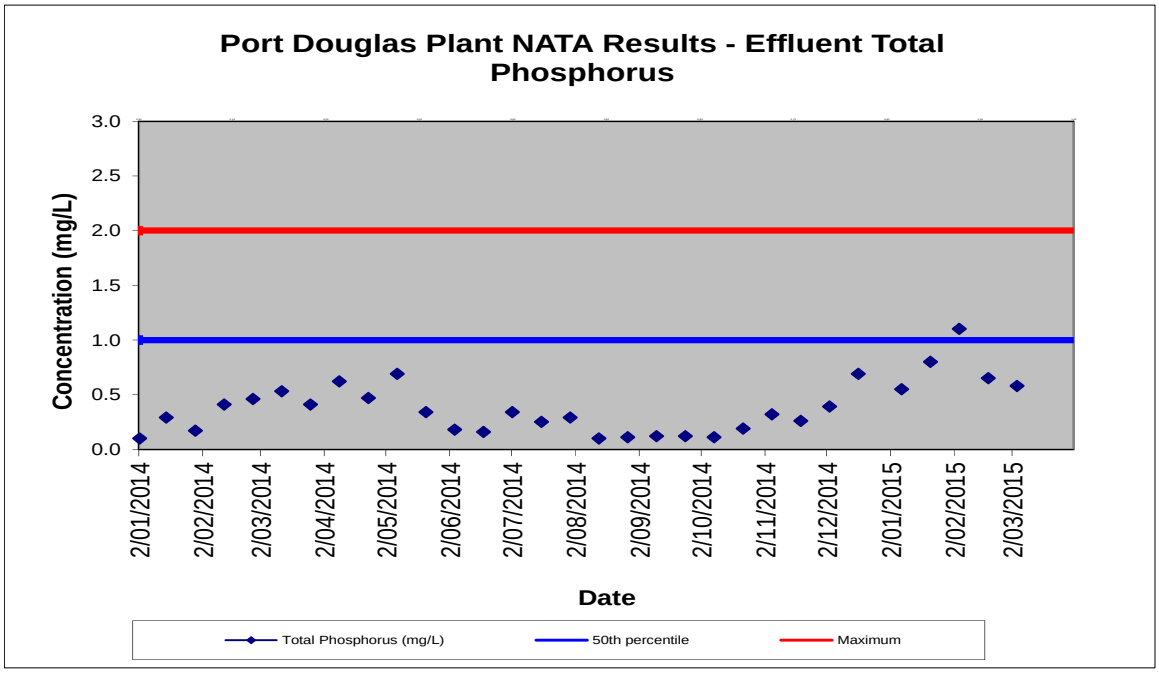


Fig 21. Port Douglas WWTP Final Effluent Test Results for Total Suspended Solids

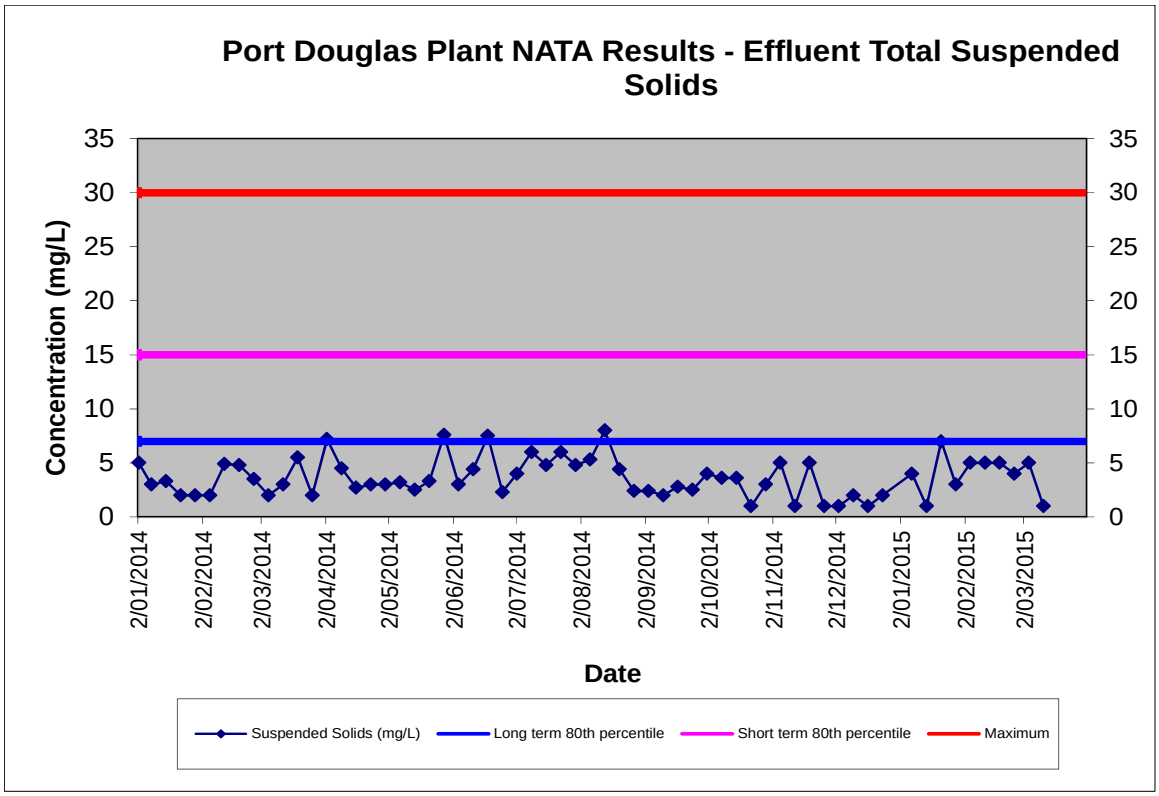
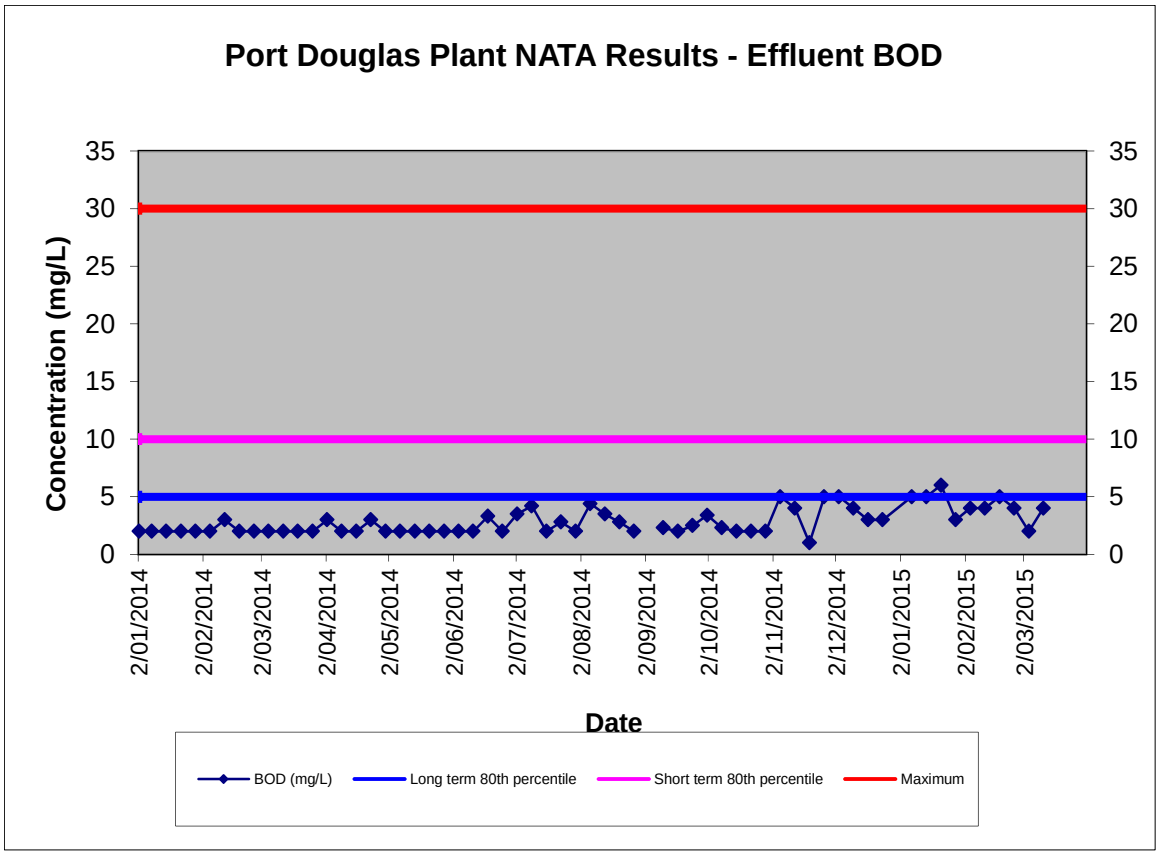


Fig. 22 Port Douglas WWTP Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)



Mossman WWTP

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids & BOD) are shown in Figures 23, 24, 25 & 26.

Fig. 23 Mossman WWTP Final Effluent Test Results for Ammonia

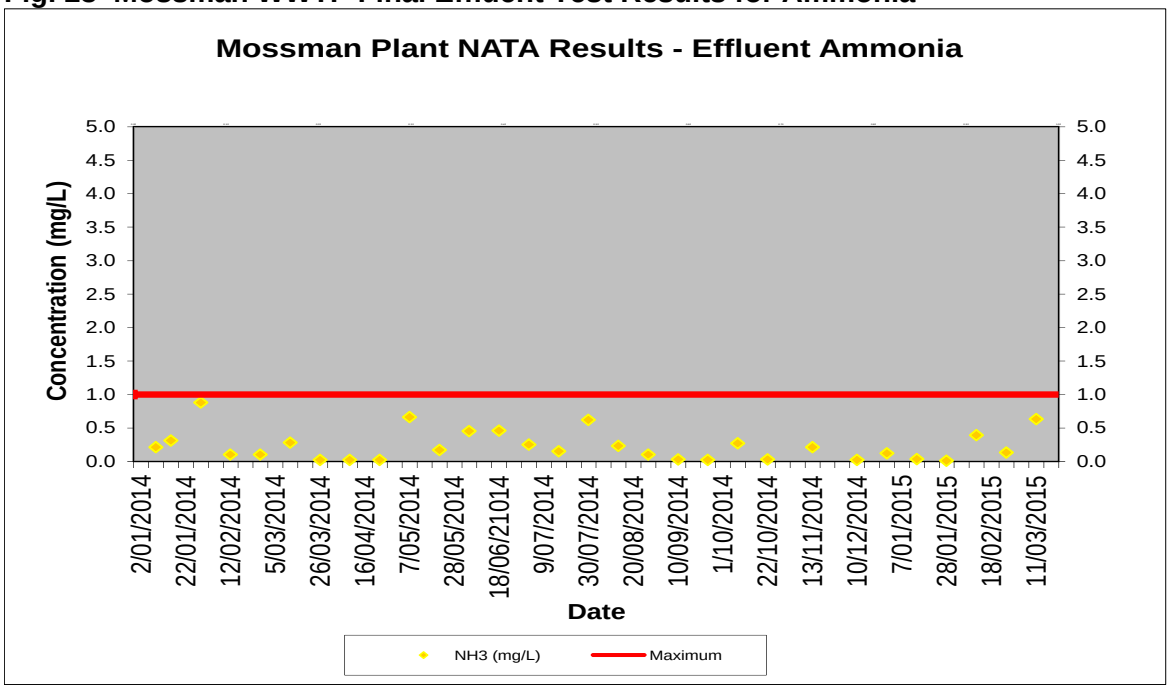


Fig. 24 Mossman WWTP Final Effluent Test Results for Total Phosphorous

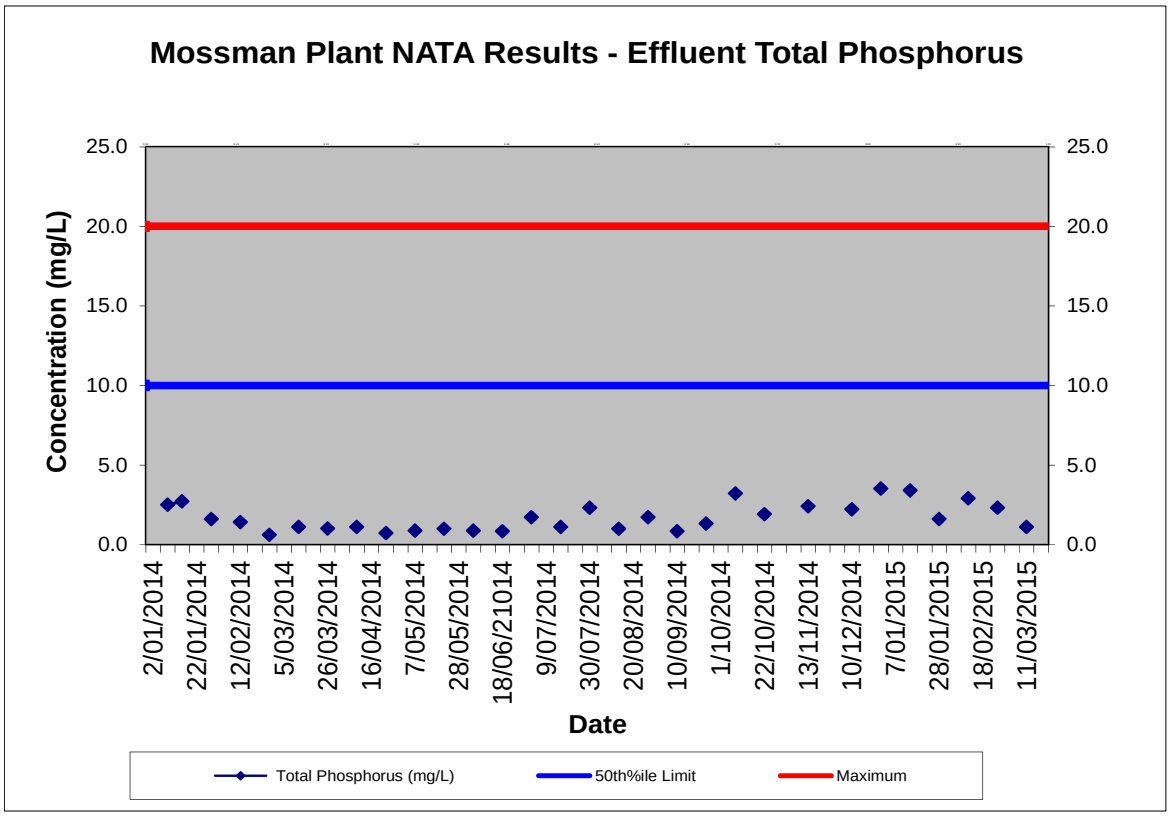


Fig. 25 Mossman WWTP Final Effluent Test Results for Total Suspended Solids

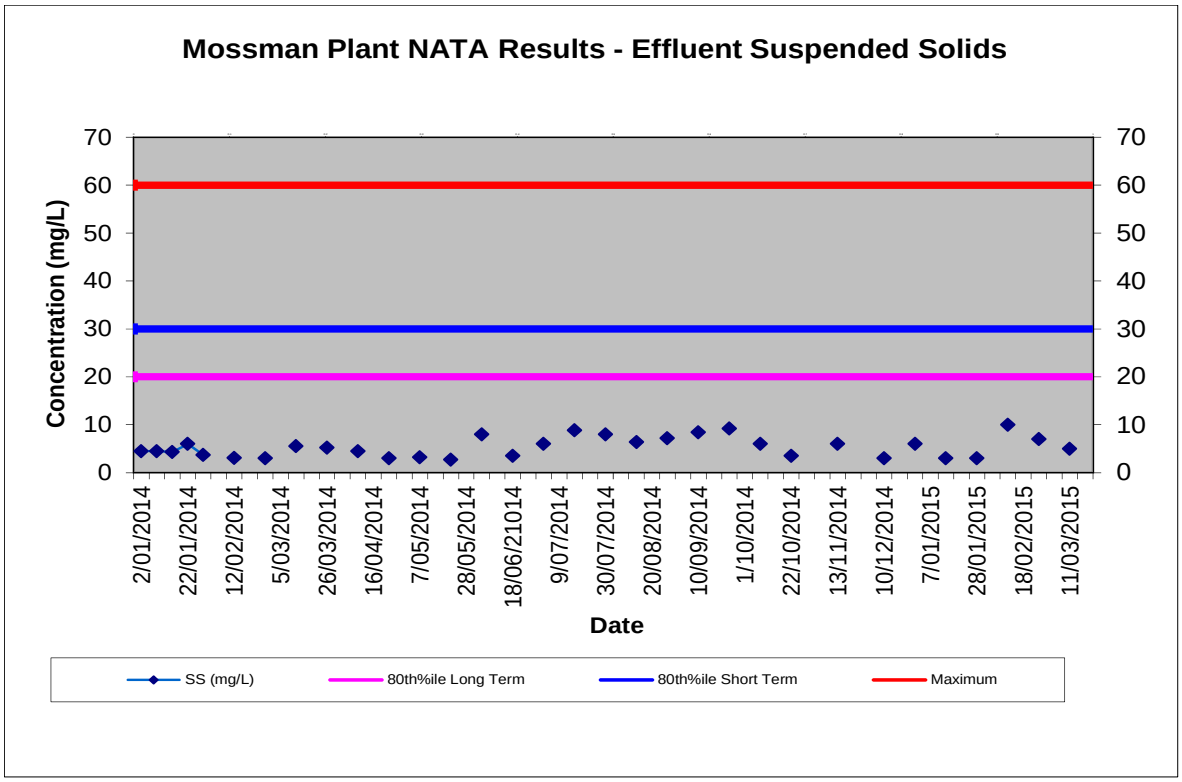
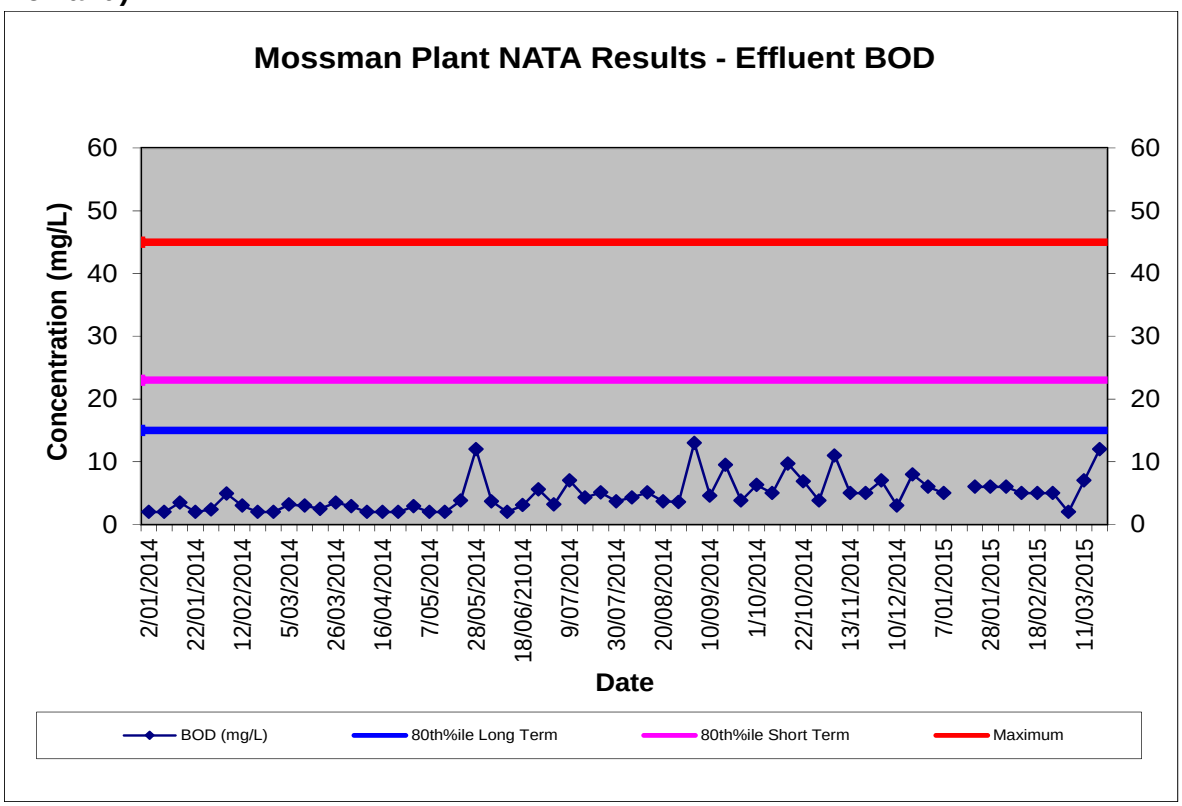


Fig. 26 Mossman WWTP Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)



8. Liquid Trade Waste

Six water and wastewater staff members attended training on the monitoring of Trade Waste during 10-12 February 2015. This is a nationally recognised course and prepared the staff to co-ordinate, implement and report on trade waste monitoring activities.

After analysis of Council's Authority system and associated modules relating to the trade waste register and taking into account legislative requirements, workflow processes for actions and outcomes were implemented in early March 2015. Since then extensive work has been done to streamline the current trade waste register aspects to improve efficiency, and to reflect the Douglas Shire Council process currently being implemented. This includes associated system modules that also interface with the register. Templates and additional information capture areas have also been improved to make the work flow process more effectively.

All aged debtor accounts that were inherited from Cairns Regional Council are now accounted for and only current financial aspects issued by Douglas Shire Council are being administered. These are within acceptable parameters.

Compliant trade waste discharges will greatly improve Council's maintenance of the sewerage system and improve wastewater plant performance.

Table 12. Trade Waste Dischargers - Inspections

Inspections	Total No
New applicants / Change of occupancy	6
Renewal applicants	21
Follow-up inspections	7

Table 13. Trade Waste Dischargers - Approvals

Approvals	Total No
New approvals issued	3
Renewal approvals issued	0
Other businesses identified as requiring approvals	8