5.6. WATER AND WASTEWATER QUARTERLY REPORT FOR THE PERIOD ENDING DECEMBER 2018

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DEPARTMENT:	Water and Wastewater

RECOMMENDATION

That council receives and notes the Quarterly Report of the Water and Wastewater branch for the period ending 31 December 2018.

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 2018.

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 the Mossman – Whyanbeel water mains interconnection phase 3 and the Port Douglas Wastewater Treatment Plant ultra violet lamp replacements.

BACKGROUND

This report is the second Quarterly Report submitted by the Water and Wastewater Branch during the 2018/2019 Financial Year. This report highlights progress against key performance areas required by the Department of Energy and Water Supply and required compliance levels by the Department of Environment and Heritage Protection.

COMMENT

This report enables Councillors and the community to obtain a strategic view of activities within the Water and Wastewater Branch.

The Quarterly Report documents progress on key operational and service delivery aspects and regulatory compliance levels.

The Water and Wastewater Quarterly Report does not include comprehensive progress reporting in terms of the Capital Works Programs, Operational Plan and financial statements as these are dealt with in separate Quarterly Reports to Council.

FINANCIAL/RESOURCE IMPLICATIONS

Failure to comply with required standards and to respond quickly and effectively to water and wastewater incidents may result in harm to the community and substantial penalties.

RISK MANAGEMENT IMPLICATIONS

Council, as a registered water service provider, has a statutory obligation to ensure it provides 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 3 - Improve Environmental Performance

3.2.3 - Investigate process improvements at Council's wastewater treatment plants to improve wastewater quality, save energy and identify markets for end products.

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 2018-2019 Actions:

2.1.2 - Additional water extraction site designed and integrated into existing water infrastructure.

2.1.3 - Asset Edge trial for Water and Wastewater operations.

3.1.1 - Develop and implement a Trade Waste Environmental Management Plan and update processes and software to ensure compliance and efficiency.

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:

- **Asset-Owner** Meeting the responsibilities associated with owning or being the custodian of assets such as infrastructure.
- **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 2018 [5.6.1]

1 October 2018 – 31 December 2018

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 of Natural Resources, Mines and Energy (DNRME) and the Department of Environment and Science (DES).

The amended Drinking Water Quality Management Plan (DWQMP) is a new user friendly health based risk management plan that demonstrates how public health risks are managed. In addition, the plan also describes how Douglas meets the requirements of the environmental authority for the Mossman Water Treatment Plant under the Environmental Protection Act (1994) and Water Licences under the Water Act 2000.

Water

1. Water reticulation services

General maintenance was carried out on all schemes for this quarter including all intakes. Due to the continued dry weather in this reporting period flushing was carried out when necessary for example when there is a water mains break or a water quality complaint

Regular reservoir and pump station checks and intake maintenance are carried out on all schemes. Table 1 below shows the number of maintenance activities undertaken across all schemes.

Table 1. Water Reticulation Services

Douglas Shire Reticulation (all schemes)							
Settlement Meter Reads	116						
New Water Services Connections	14						
Service Repairs	149						
Water Mains Repairs	14						
Water Quality Complaints	2						
Flushing Events: Mossman/Port Douglas/Cooya/ Newell							
Flushing Events: Whyanbeel/Wonga							

There were 2 water quality complaints during the reporting period. Table 2 below shows the nature of the complaint, how it was resolved and the response time.

Table 2. Water Complaints

Address	CRM No & Date	Nature of water complaint	How it was resolved	Response Time
43-47 Macrossan St, & 24 Andrews St, Port Douglas	65484 16/11/2018	Tap water was brown in colour	Water main was flushed with good results and water became clear without any further issues.	20 mins
5 Cyril Cl, Newell Beach	65712 26/11/2018	Large white particles coming from water taps	Flushed at meter and sampled residual 1.02 mg/L. Customer was satisfied and no further action required.	30 mins

Capital works program is complete on the Mossman – Whyanbeel water mains interconnection phase 3 and is within budget. This capital works project connects the Mossman scheme to the Wonga scheme within a 225 mm water main and will increase water security for both schemes. Installation of a bore for the Daintree water scheme phase 2 is well underway and is progressing well. All other water reticulation capital works programs are currently in design stages.

2. Water schemes and potable water consumption

Water Restrictions

Level 2 water restrictions remained in force throughout October and November however on 28 November 2018 Council implemented level 3 water restrictions. The implementation was introduced due to Rex Creek Intake water level dropping fast during a very dry couple of months. The climate outlook overview from the Bureau of Metrology stated that November, in particular, would be much drier than average. Level 3 water restrictions ban the use of sprinklers and irrigation systems. During the level 3 water restrictions period Council water reticulation and local laws teams enforced this regulation.

In early December ex-cyclone Owen which crossed the far northern coast on 10 December 2018. This weather system increased the water levels at Rex Creek Intake which resulted in recommending Council to downgrade the level 3 water restrictions to level 2 on 11 December 2018.

During the Christmas shut down period another heavy rain monsoonal event increased the water intake levels. As a result, Council removed the level 2 water restrictions and Council implemented NO water restrictions on 2 January 2019. Figure 1 shows the Mossman Water Treatment Plant usage and Rex Creek Intake levels for the period 01 October through to 31 December 2018.



Fig 1. Mossman WTP usage and Rex Creek intake levels for the period 1 October 2018 – 31 December 2018

All Schemes

Raw water quality has been good throughout all schemes aside from during the major rain events. In October and November the weather continued to be extremely dry with the intake levels dropping alarmingly. However, in the month of December we received monsoonal rain from ex-tropical cyclone Owen and ex-tropical cyclone Penny resulting in heavy rainfalls in the catchments. Intake levels recovered and have remained stable with good flows. Raw water quality (aside for the weather events) has been good with average turbidity below 0.9 NTU.

Throughout the water schemes, all pump stations performed well with no incidents.

The De Meio Drive bore field and non-potable storage reservoir operated at normal production. Both Flagstaff and Rocky Point reservoirs performed well and chlorine levels have been stable in all schemes. Craiglie reservoir was fully operational and Port Douglas (Crees Road) reservoir was commissioned and filled to capacity augmenting the regions water supply with an additional 20ML of storage.

Cert IV water industry training continued for two plant operators and additionally gas chlorine handling safety and breathing apparatus training was completed.

Mossman/Port Douglas Scheme

Mossman Water Treatment Plant met all demand requirements during the reporting period.

Consumer demand continued to increase in line with seasonal trends resulting in water restrictions across the shire.

Rex Creek intake levels slowly decreased (typical of the dry season) and were at a low of 0.17m in the early part of the reporting period but in the latter part of the period heavy rains and flooding replenished the catchments resulting in good flows in all intakes.

Attachment 5.6.1 45 of 61 All Ultra Filtration (UF) racks were operational and maintenance works continued with cartridge repairs to ensure compliance with UF rack integrity test limits. General maintenance works were also undertaken.

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

Mossman Water Supply

The total monthly consumption of water in Mossman, Cooya Beach and Newell Beach areas can be seen in Figure 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 Figure 3.

Fig 3. Port Douglas Scheme Monthly Consumption Figures

Whyanbeel Water Treatment Plant met all demand requirements during the reporting period.

The little falls creek intake level dropped steadily to a low of 0.15m and then in the latter part of the period heavy rains and flooding in the catchment resulted in good flows and high levels at the intake. Reservoir levels remained near capacity to ensure consumer demand was met.

The UF rack was fully operational during the reporting period. To maintain UF filter efficiency chemical clean-in-place operations were undertaken and general maintenance work continued.

There were no water quality reportable incidents in the Whyanbeel water scheme for the reporting period.

Whyanbeel Water Supply



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

Fig 4. Whyanbeel Scheme Monthly Consumption Figures

Daintree Scheme

Daintree Water Treatment Plant met all demand requirements during the reporting period.

During October and November the intake levels at Martin Creek steadily decreased. Heavy rains in December resulted in flooding; a number of blockages at the intake and raw water turbidity events. After the heavy rains the intake level recovered and has remained high. Reservoir levels were adequate to meet consumer demand.

To maintain UF filter efficiency chemical clean-in-place operations were undertaken and general maintenance works continued.

There were no water quality reportable incidents in the Daintree water scheme for the reporting period.

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The total monthly consumption of water in the Daintree scheme can be seen in Fig 5.

Fig 5. Daintree Scheme Monthly Consumption Figures

3. Water quality monitoring and results

Drinking water is sampled at intakes, reservoirs and in the reticulation network to ensure compliance with the Australian Drinking Water Guideline (ADWG).

Water quality verification monitoring includes testing of individual reticulation zones regularly with monthly sampling at the reservoirs. Supporting programs for the verification of drinking water quality include;

- Water treatment plants and reservoirs that have SCADA alarms for action and critical limits and are operated under critical control points;
- Reservoir inspections that are done regularly to ensure that the reservoirs are intact and that any points of ingress are repaired; and
- Network operations that have a flushing program that ensures the chlorine residual is above 0.2 mg/L.

For the reporting period a total of 78 treated water E.coli compliance samples were taken in the three drinking water schemes. A total of 25 E.coli samples were tested in the Douglas water laboratory and 53 in NATA accredited laboratory. Other parameters monitored allow us to observe trends in water quality through the schemes. All tested parameters in drinking water samples during the reporting period were compliant with ADWG health guideline values and standards required by the Water Supply Regulator and Queensland Health.

In addition 9 raw water E.coli samples were taken at the intakes. Raw water sampling assists us to understand the treatment plant needs and the health based targets.

Mossman/Port Douglas Supply Scheme

Average monthly values for key operational and compliance parameters can be seen in Tables 3 and 4 for treated water at Port Douglas Reservoirs and Port Douglas/Mossman Reticulation network, respectively. Figure 6 indicates the daily turbidity trends at the intake

Table 3. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.

Month	рН	Temp °C	Total Alkalinity mg CaCO3/L	Free Cl mg/L	Total Cl mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0 - 200	0.2 - 5.0	<5	<1
Oct-18	6.3	23	8	1.1	1.1	<1
Nov-18	6.7	27	7	1.1	1.2	<1
Dec-18	6.8	27	<5	1.1	1.1	<1

Table 4. Average monthly values for key operational and compliance parameters in the Mossman/Port Douglas Reticulation Network.

Month	рН	Temp °C	Free Cl mg/L	Total Cl mg/L	Colour PCU	Cu mg/L	Fe mg/L	Mn mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0.2 - 5.0	<5	<15	<1	<0.3	<0.1	<1
Oct-18	6.9	27	0.9	0.9	<5	0.018	0.012	<0.005	<1
Nov-18	6.8	29	0.7	0.8	<5	0.013	0.006	<0.005	<1
Dec-18	6.7	29	0.5	0.6	<5	0.012	0.008	<0.005	<1





Whyanbeel Supply Scheme

Average monthly values for key operational and compliance parameters can be seen in Tables 5 and 6 for treated water at the Whyanbeel Reservoir and Whyanbeel Reticulation Network, respectively. Figure 7 indicates the daily turbidity trends at the intake and treated

Table	5.	Average	monthly	values	for	key	operational	and	compliance	parameters	in	the
Whyar	۱be	el Reserv	oir.			-	-		-	-		

Month	рН	Temp °C	Total Alkalinity mg CaCO3/L	Free Cl mg/L	Total Cl mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0 - 200	0.2 - 5.0	<5	<1
Oct-18	7.4	27	11	1.1	1.1	<1
Nov-18	7.4	30	11	1.1	1.2	<1
Dec-18	7.6	29	11	1.0	1.2	<1

Table 6. Average monthly values for key operational and compliance parameters in the Whyanbeel Reticulation Network.

Month	рН	Temp °C	Free Cl mg/L	Total Cl mg/L	Colour PCU	Cu mg/L	Fe mg/L	Mn mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0.2 - 5.0	<5	<15	<1	<0.3	<0.1	<1
Oct-18	7.3	27	0.9	1.0	<5	0.008	0.017	<0.005	<1
Nov-18	7.2	29	0.8	0.8	<5	0.005	0.018	<0.005	<1
Dec-18	7.3	29	0.7	0.7	<5	0.006	0.020	<0.005	<1

Fig 7. Turbidity trends at the Little Falls Creek intake and treated water at the Whyanbeel Water Treatment Plant



Average monthly values for key operational and compliance parameters can be seen in Table 7 for treated water at Daintree Reticulation network. Figure 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 2018.

Table	7.	Average	monthly	values	for	key	operational	and	compliance	parameters	in	the
Daintr	ee	Reticulation	on Networ	rk.								

Month	рН	Temp °C	Free Cl mg/L	Total Cl mg/L	Colour PCU	Cu mg/L	Fe mg/L	Mn mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0.2 - 5.0	<5	<15	<1	<0.3	<0.1	<1
Oct-18	7.6	27	0.7	0.7	<5	0.012	0.009	<0.005	<1
Nov-18	7.5	27	0.3	0.4	<5	0.011	<0.005	<0.005	<1
Dec-18	7.4	29	0.5	0.1	<5	0.009	0.008	<0.005	<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 8 below shows the number of maintenance activities undertaken across all schemes.

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	17	7
Sewer Chokes	4	1
Sewer Main Breaks	3	0
HCB Repairs (House Connection Branch)	2	2
Odour Complaints	0	0

Influent and irrigation flows

Port Douglas Wastewater Treatment Plant

A total of 258,007 kL of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average daily flow was 2,804 kL/day. Tanker truck contractors delivered 643.547 kL of septage to the plant and 1,695.7 kL of Leachate from the Killaloe Landfill and Transfer Station. Influent is treated in a Sequencing Batch Reactor (SBR) which produced compliant effluent during the reporting period. A total of 55.17% of the treated effluent was pumped to two resorts and the remaining discharged into the Dickson Inlet. The Sheraton Mirage received 95,578 kL and Palmer Sea Reef received 46,752 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 953.5 mm. On 25 December 2018, the highest rainfall on a day was recorded as 195 mm.

Daily inflows and total monthly flows for the reporting period are presented in Fig 9 and 10 respectively.



Fig 9. Port Douglas Daily Inflow



Fig 10. Port Douglas Total Monthly Flow 2018

Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 79,162 kL during the reporting period. The average daily flow was 860 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River. A total of 1,309 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 259 mm on 25 December 2018.

Douglas Shire Council Environmental Authority Permit EPPR01790513 states an inflow limit: Inflows must not exceed the peak design capacity of three times the Design Average Dry Weather Flow (DADWF) of 1.15 ML/day – equating to 3.45 ML/day – on any day unless the standard treatment processes of the plant are bypassed.

Outflow and Inflow data for the reporting period are shown in Fig 11 and 12 respectively.



Fig 11. Mossman Wastewater Treatment Plant Daily Outflow Ordinary Council Meeting - 19 February 2019



Fig 12. Mossman Wastewater Treatment Plant Total Daily Inflow 2018

5. Bio-solids Production

Bio-solids were produced at the dewatering plants at Mossman Wastewater Treatment Plant (12.1% solids) and Port Douglas Wastewater Treatment Plant (11.9% 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, 393.16 tonnes of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet Biosolids equates to 47.01 dry tonnes.



The monthly bio-solids production trends can be seen in Figure 13.

Fig 13. Port Douglas Wastewater Treatment Plant monthly bio-solids production 2018

Mossman Wastewater Treatment Plant

At Mossman Wastewater Treatment Plant, 36.08 tonnes of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet Biosolids equates to 4.37 dry tonnes.



The monthly bio-solids production trends can be seen in Figure 14.



*No Bio-solids removed in November 2018.

Effluent quality and compliance

During the reporting period compliance sampling was conducted as per EPPR01790513 license conditions, see Table 9.

Table 9. Monitoring of contaminant releases to waters as per Environmental Authority EPPR01790513

Characteristics Determination	PDWWTP Frequency	MWWTP Frequency
5-day Biochemical Oxygen Demand	weekly	fortnightly
Suspended Solids	weekly	fortnightly
рН	weekly	weekly
Dissolved Oxygen	weekly	weekly
Ammonia Nitrogen	fortnightly	fortnightly
Total Nitrogen	fortnightly	fortnightly
Total Phosphorus as P	fortnightly	fortnightly
Oil and Grease	fortnightly	fortnightly
Faecal Coliforms (Organisms/100ml)	fortnightly	fortnightly
Free residual chlorine	-	fortnightly

Additionally more samples were taken from the treatment processes, bio-solids, receiving waters and bores. Samples were tested by a NATA accredited laboratory for physical, chemical and microbiological parameters. All parameters tested during the reporting period in the Port Douglas and Mossman catchments were compliant.

The process and compliance is monitored each day by in-house analyses of samples at the

Attachment 5.6.1 55 of 61 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 Figure 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 & 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 BOD₅ (Biochemical Oxygen Demand)