

**Sarina Water Recycling Facility
Department of the Environment
and Energy Annual Report 01 July
2018 to 30 June 2019**

Contents

Introduction.....	2
Annual Report Submission.....	2
Average Dry Weather Flow and Maximum Peak Weather Flow	2
Total Nitrogen and Total Phosphorus	3
Annual Mass Loads	5
Non-compliance with EPBC approval 2011/6005	6

Figures

Figure 1: SWRF Treated Effluent Total Nitrogen (01 July 2018 to 30 June 2019)	4
Figure 2: SWRF Treated Effluent Total Phosphorous (01 July 2018 to 30 June 2019)	5

Tables

Table 1: SWRF Treated Effluent Total Nitrogen and Total Phosphorous (01 July 2018 to 30 June 2019)	3
Table 2: Mass Loads Total Nitrogen and Total Phosphorous SWRF (01 July 2018 to 30 June 2019)	5

Annual Report Sarina Recycled Water Recycling Facility EPBC 2011-6005 for the reporting period 01 July 2018 – 30 June 2019

Introduction

Construction of the Sarina Water Recycling Facility (SWRF) commenced on 04 February 2013. The first inflow into the plant commenced on 01 August 2014 with the first releases to Plane Creek on 09 August 2014. The plant was formally handed over to council on 14 November 2014.

The SWRF replaced the 40-year-old Sarina Sewage Treatment Plant which used an outdated Biological Trickle Filter treatment process. The SWRF is an 8,000 EP biological nutrient removal plant utilising a membrane bioreactor process. The main plant comprises of inlet works, a biological reactor and a submerged membrane reactor. The sludge handling is by aerobic digestion and centrifuge dewatering.

Additional and peripheral plant includes the chemical dosing systems for sodium hypochlorite, alum, caustic soda, citric acid and polymer additions, dewatering plant, chemical storage, switchroom and transformer, and the associated support equipment for the central process area. With the addition of an integrated membrane system, the plant can meet effluent pathogen quality requirements and also provides for tertiary filtration, allowing the effluent to be utilised for supply to recycled water schemes.

Annual Report Submission

This is the annual report as per EPBC approval 2011/6005 for the twelve-month period from 01 July 2018 to 30 June 2019. This report was submitted to the Department of the Environment and Energy and uploaded to council's website as per Condition 2 of the authorisation.

01 July to 30 June is an amended reporting period and was requested by Mackay Regional Council to bring the EPBC reporting into line with other statutory reporting periods. The Department of the Environment and Energy approved the amendment to the reporting period on 02 August 2016.

Maximum Dry and Wet Weather Flows

The maximum release to waters from SWRF on any wet weather day for the period of 01 July 2018 to 30 June 2019 was 7.53 ML. The maximum release to waters from SWRF on any dry weather day for the period of 01 July 2018 to 30 June 2019 was 0.94 ML. These release volumes are below the limits stipulated in Condition 5 of EPBC approval 2011/6005.

Total Nitrogen and Total Phosphorus

The maximum concentrations of Total Nitrogen and Total Phosphorus for treated effluent released to Plane Creek during the reporting period are represented in Table 1 and graphically in Figures 1 and 2.

Table 1: SWRF Treated Effluent Total Nitrogen and Total Phosphorus (01 July 2018 to 30 June 2019)

Sample Date	Total Nitrogen (mg/L)		Total Phosphorus (mg/L)	
	Result	Maximum*	Result	Maximum*
2/07/2018	3.2	15	0.32	3
10/07/2018	3	15	0.51	3
18/07/2018	3.3	15	0.15	3
26/07/2018	4	15	0.44	3
3/08/2018	3.4	15	0.47	3
11/08/2018	4.9	15	1.09	3
19/08/2018	3.8	15	3.28	3
27/08/2018	3.5	15	0.49	3
4/09/2018	2.1	15	0.69	3
12/09/2018	4.1	15	0.54	3
20/09/2018	3.1	15	0.77	3
28/09/2018	2.8	15	0.43	3
6/10/2018	3.5	15	0.58	3
14/10/2018	4.5	15	0.55	3
22/10/2018	3.7	15	0.41	3
30/10/2018	3.8	15	0.52	3
7/11/2018	4	15	0.49	3
15/11/2018	3.4	15	0.82	3
23/11/2018	3.4	15	0.64	3
1/12/2018	4	15	1.11	3
9/12/2018	3.6	15	0.22	3
17/12/2018	2.4	15	0.74	3
27/12/2018	2.1	15	0.5	3
2/01/2019	2.7	15	0.46	3
10/01/2019	2.6	15	0.76	3
18/01/2019	2.4	15	0.62	3
26/01/2019	3.4	15	0.32	3
3/02/2019	2.3	15	0.88	3
11/02/2019	5.3	15	0.75	3
19/02/2019	4.6	15	<0.1	3
27/02/2019	3.2	15	0.2	3
7/03/2019	2.6	15	0.2	3
15/03/2019	4.8	15	0.63	3
23/03/2019	4.3	15	0.32	3
31/03/2019	1.9	15	0.2	3
8/04/2019	4.3	15	0.15	3

Sample Date	Total Nitrogen (mg/L)		Total Phosphorus (mg/L)	
	Result	Maximum*	Result	Maximum*
16/04/2019	4.2	15	0.17	3
24/04/2019	3.7	15	0.3	3
1/05/2019	4.3	15	0.33	3
10/05/2019	3.8	15	0.3	3
18/05/2019	4.1	15	0.35	3
26/05/2019	4.2	15	0.32	3
3/06/2019	5	15	0.46	3
11/06/2019	3.4	15	0.23	3
19/06/2019	3.8	15	0.14	3
27/06/2019	3.5	15	0.34	3

* as per Condition 6 of EPBC Approval 2011/6005

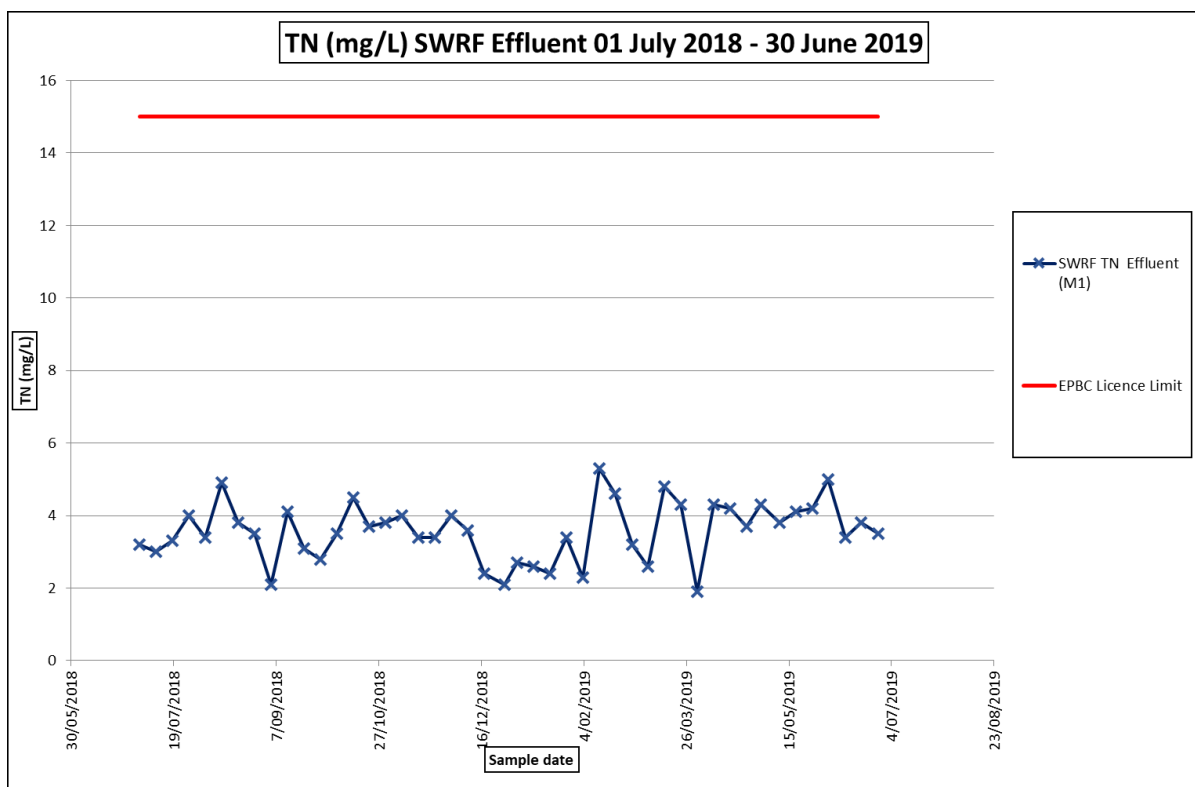


Figure 1: SWRF Treated Effluent Total Nitrogen (01 July 2018 to 30 June 2019)

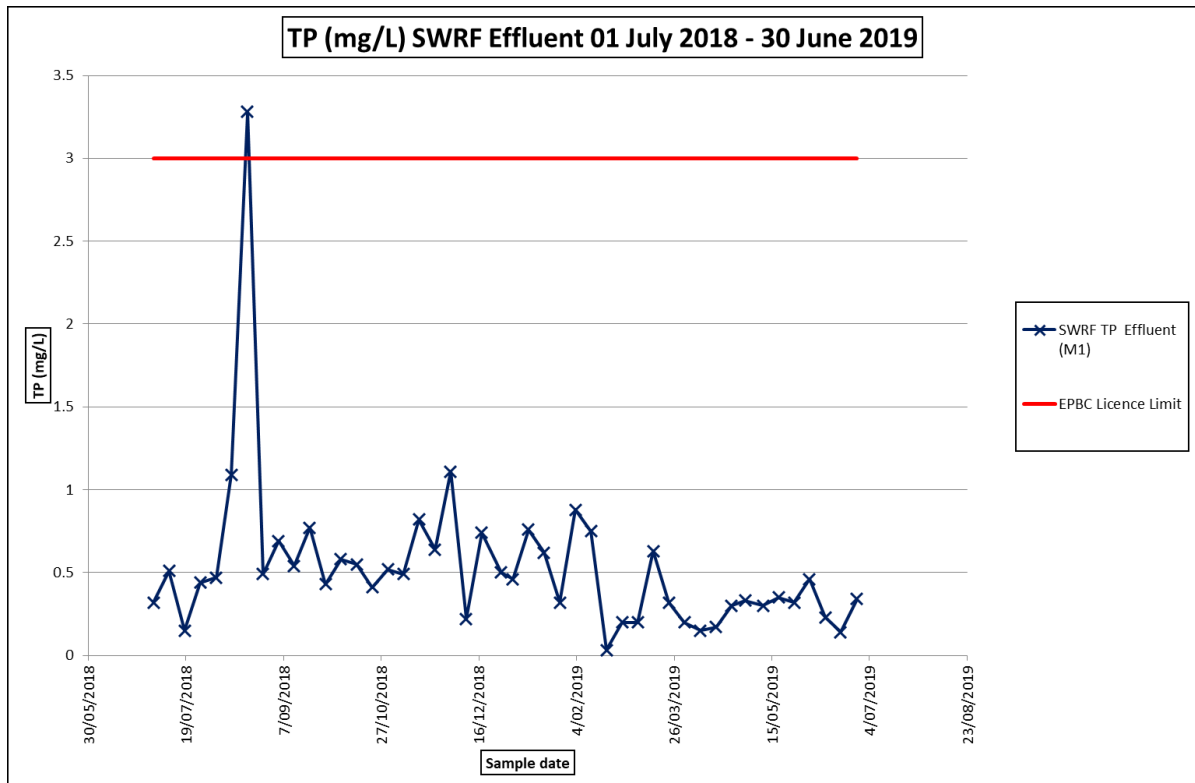


Figure 2: SWRF Treated Effluent Total Phosphorous (01 July 2018 to 30 June 2019)

Annual Mass Loads

Table 2 below shows the annual mass loads released to Plane Creek for the reporting period for both Total Nitrogen and Total Phosphorous. To bring the mass load calculation into line with annual NPI reporting, the methodology used to determine the mass loads of Total Nitrogen and Total Phosphorous was as per the methodology used in Example 7 of the NPI EET Manual for Sewage and Wastewater Treatment.

Both Total Nitrogen and Total Phosphorous mass loads were below the limits stipulated in Condition 7 of EPBC Approval 2011/6005.

Table 2: Mass Loads Total Nitrogen and Total Phosphorous SWRF (01 July 2018 to 30 June 2019)

	Mass Load (kg)	Limit (kg)
Total Nitrogen	916	4,338
Total Phosphorous	118	868

There have been no reports of any slick or visible evidence of oil or grease, litter or other objectionable matter at the release point M1.

Non-compliance with EPBC approval 2011/6005

There were two non-compliances with EPBC approval 2011/6005 within the reporting period:

- 21 - 22 July 2018- partial screen blockage and subsequent screened bypass of 642 kL to Plane Creek;
- 19 August 2018 – exceedance in total phosphorous;

These non-compliances were reported to the Department of the Environment and Energy within the required timeframes. Investigation reports submitted to the department outlined the details of the non-compliances including the cause, impacts and mitigation measures. A summary of the non-compliances is provided below.

Partial Screen Blockage and Screened bypass – 21- 22 July 2018

A service water supply failure at Sarina Water Recycling Facility (SWRF) caused a partial screen blockage which resulted in bypass to Plane Creek. An estimated volume of 642 kL of screened bypass was released to Plane Creek (via treated effluent release point SW1) from 10am Saturday 21 July 2018 until 11.15am Sunday 22 July 2018.

The bypass was not recorded by SCADA and was identified during an investigation on the 23 July 2018 in response to a customer complaint. The bypass volume and duration was determined after a review of log sheets and reconciliation of volumes of influent.

Impacts to water quality within Plane Creek as a result of the bypass event would have been short term (i.e. during and immediately following the bypass event). Short term impacts would have related to high nutrient concentrations, high turbidity and suspended solids and low dissolved oxygen as is associated with waste water treatment plant influent quality.

Exceedance in total phosphorous – 19 August 2018

A SWRF Permeate sample collected on 19 August 2018 returned a Total Phosphorous result of 3.3 mg/L. This is a breach of the 3.0 mg/L maximum Total Phosphorous release limit to waters as per 2011/6005 Condition 6.

The sample collected on the 19 August 2018 was taken from the SWRF's auto-sampler which collects composite samples from the previous 24 hours. As such this sample is representative of treated effluent from SWRF during this period. Treated effluent from SWRF was sent to both Plane Creek and the Sarina Golf Course (for re-use) during this period.

The breach was due to failure of the phosphate monitor in the treatment train and issues with the accuracy of the total phosphorous bench test conducted by the operators Both issues have been rectified.