

22 Exeter STP

22.1 Activity and report details

Activity name	Exeter STP		
Activity address	Off West Tamar Highway, Exeter		
Permit number	Licence to Operate - 2726	Date of issue	6/08/1982
EPN	498/1	Date of issue	6/06/2003
Treatment level	Secondary Treatment		
Authorised Dry Weather Flows	150 kL/day		
Key Influent Source	Residential		
Contact person	Kate Westgate		
Report author	George Fitzgibbon		
Contact details	Environment@taswater.com.au		
Date of submission	30 September 2023		

Figure 22--1: Exeter Sewage Treatment Plant



22.2 Monitoring and compliance summary

22.2.1 Flow data

Table 22-A: Flow monitoring summary

	Influent	Effluent	Reuse
Location Name	Inlet	Unnamed tributary to the Tamar River	Exeter Golf Course
Coordinates	E 496812 N 5427495	E 496197 N 5427654	E 496770 N 5427639
Method of Measurement	In line meter	Influent less Reuse	In line meter
Date of last Calibration/Validation (if applicable).	26/09/2022	NA	12/07/2022

Table 22-B: Annual flow and rainfall data

Month	Average Daily Influent Volume (kL/day)	Rainfall (mm/month) BOM Station ID 91341	Discharge to Waters Total Effluent Volume (ML)	Discharge to Reuse Total Effluent Volume (ML)
July 2022	209	34.6	0.00	6.49
August 2022	362	145.6	9.77	1.45
September 2022	261	76.2	7.83	0.00
October 2022	330	205.0	10.23	0.00
November 2022	268	84.6	8.05	0.00
December 2022	133	19.8	4.13	0.00
January 2023	122	30.2	1.49	2.30
February 2023	129	34.2	0.00	2.97
March 2023	140	77.2	0.00	3.91
April 2023	154	59.0	0.00	4.72
May 2023	162	37.2	0.00	4.59
June 2023	271	75.4	2.53	5.58
Annual 2022-23	212	879.0	44.04	32.01
% of Total Discharge	--	--	57.9%	42.1%

2022-23 monthly flow data was submitted directly to the EPA.

22.2.2 Bypass events

There were no bypass events associated with the STP during the reporting period.

22.3 Discharge compliance with permit limits

Table 22-C: Compliance Summary

Parameter	Ammonia	BOD5	Chlorine	Nitrogen	Oil and grease	pH	Phosphorous	E coli	Total suspended solids
Permit/EPN limit	mg/L	mg/L	mg/L	mg/L	mg/L	Units	mg/L	MPN/100ml	mg/L
Maximum	30	50	--	40	10	9.0	15	--	50
90th percentile	--	--	--	--	--	--	--	--	--
50th Percentile	--	--	--	--	--	--	--	1000	--
Minimum	--	--	--	--	--	5.5	--	--	--
Samples analysed									
Number required	12	12	--	12	12	12	12	12	12
Number analysed	12	12	--	12	12	12	12	12	12
Statistical summary									
Max	32.2	99	--	42.5	3.9	7.8	7.7	24196	88.0
90th percentile	25.6	91	--	35.6	3.6	7.7	7.3	22012	84.9
50th percentile	11.7	48	--	23.8	2.4	7.6	5.3	491	30.5
Min	4.9	21	--	13.0	1.0	7.1	3.0	20	12.9
EPN Limit Compliance									
% compliance with Maximum	92%	50%	--	92%	100%	--	100%	--	67%
% compliance with 90th percentile	--	--	--	--	--	--	--	--	--
% compliance with 50th percentile	--	--	--	--	--	--	--	67%	--
% compliance with pH range	--	--	--	--	--	100%	--	--	--

Note: Percentages reflective of complete data set for the year

Table 22-D: Mass loads to the environment

Parameter	EPN Limit	Frequency	2022-23 result
Nitrogen (kg)	2200	Annual	1001.7
Phosphorous (kg)	850	Annual	171.6
Method	Time weighted/Grab sample method		

Table 22-E: Performance Analysis (Discharge to environment)

Effluent compliance parameter	Date(s) of non-compliance	Reasons for non-compliance	Actions to improve performance
BOD	12/10/2022 14/12/2022	Algae and sludge accumulation in the lagoons are believed to be the primary reason for non-compliant BOD and TSS.	Desludging of the lagoons
TSS	12/10/2022	High sludge accumulation decreases the effective lagoon treatment capacity, resulting in high effluent BOD. Accumulated sludge can also be carried over due to poor settling, increasing effluent TSS. Algae further contributes directly to effluent TSS and BOD.	

Note: Non-compliances only identified for the times STP has discharged to water

No other parameters had exceedances in the reporting period.

22.4 Reuse Annual Reporting

The Exeter STP supplies treated effluent to the Exeter recycled water scheme (RWS) for irrigation purposes at the Exeter Golf Course.

Table 22-F: Reuse Compliance Summary

Parameter	BOD5	pH	E coli
Permit/EPN limit	mg/L	Units	MPN/100ml
Maximum	50	9.0	10000
90th percentile	--	--	--
50th Percentile	--	--	1000
Minimum	--	5.5	--
Samples analysed			
Number required	12	12	12
Number analysed	12	12	12
Statistical summary			
Max	99	7.8	24196
90th percentile	91	7.7	22012
50th percentile	48	7.6	491
Min	21	7.1	20
Summary of results			
% compliance with Maximum	50%	--	83%
% compliance with 90th percentile	--	--	--
% compliance with 50th percentile	--	--	67%
% compliance with pH range	--	100%	--

Table 22-G: Performance analysis (Discharge to reuse)

Reuse Compliance Parameter	Date(s) of non-compliance	Reasons for non-compliance	FY23 actions to improve performance
BOD	01/02/2023 01/03/2023 11/04/2023 24/05/2023	During colder months, high flows due to excessive I/I (compounded by lagoon short circuiting and decreased UV disinfection) could be the root cause of non-compliant E. coli.	Desludging of the lagoons.
E. coli ^A	27/07/2022 04/08/2022	During warmer months, algal blooms can increase effluent BOD. Accumulated sludge also impacts the treatment process year-round due to the reduced effective lagoon treatment capacity.	

Note: Non-compliances only identified for the times STP has discharged to reuse

^ARisk mitigation measures of elevated E coli levels to reuse customers follows TasWater's E coli customer notification and management framework

Annual topsoil sampling was completed at five sites (ID's EX1-4 and ED Fairway 6) at the RWS in April 2023. The annual compliance audit was completed in conjunction with the soil sampling. A summary of the findings is provided in Table 22-H.

Table 22-H: Annual recycled water soil sampling and compliance audit summary

Program	Compliance audit	Soil monitoring
Summary	Ongoing minor non-compliance: Inadequate signage at clubhouse & first tee.	All sites have a history of being either borderline sodic or sodic. While ESP values decreased across all sites in 2023 (exception of EX Fairway 6 which slightly increased), all sites remain within the previously observed range. Nutrient levels are low or within recommended ranges.
Comments	Complimentary recycled water signs provided to golf course during site 2022 audit to rectify non-compliance.	Sodicity remains the main soil concern.

Groundwater site status: Green (2022 report)

Exeter RWS groundwater monitoring network consists of three groundwater bores, ID numbers EXGW1-3. Monitoring bore EXGW1 is located downslope of the recycled water storage dam. Due to timing and resourcing constraints no sampling was completed in the 2022-23 monitoring program. In response biannual sampling at the extended suite is scheduled for all bores in the 2023-24 groundwater monitoring program.

22.5 Ambient monitoring program

Table 22-I: Program details

Program	Seasonal Discharge Program - Routine monitoring during discharge to water.
Status	Ambient monitoring completed during discharge events within the reporting period.
Update	Ambient water quality monitoring conducted during seasonal discharge events.
Comments	Ambient water quality monitoring was conducted during effluent discharges into an unnamed tributary to the Tamar River receiving environment. Effluent discharges occurred from August 2022 – January 2023 and again in June 2023. Key findings from the ambient water quality monitoring data review were: <ul style="list-style-type: none"> The Default Guideline Values (DGV) for ammonia was significantly exceeded at the downstream monitoring location during effluent discharges. Ammonia levels at the upstream monitoring location were generally well below the toxicant DGV indicating the effluent discharges is the source of ammonia. Nitrate levels both at the upstream and downstream monitoring location were within the DGV for nitrate but downstream nitrate levels generally exceeded the EPA DGV for the Tamar Estuary catchment and upstream levels. There was some correlation of downstream levels with upstream levels especially in June 2023 when both locations were elevated. Generally downstream levels exceeded levels within the effluent discharge suggesting both a source of nitrate upstream and probable nitrification of ammonia downstream. Both upstream and downstream total nitrogen levels exceeded the EPA DGV with downstream levels higher than upstream levels suggesting an impact from effluent discharges.

- Both upstream and downstream total phosphorus levels exceeded the EPA DGV with downstream levels higher than upstream levels suggesting an impact from STP effluent discharges.
- Total suspended solids (TSS) levels at the downstream monitoring location generally exceeded levels at the upstream monitoring location with a significant peak in September 2022. Downstream levels did not appear to correlate with effluent discharges.
- Enterococci levels at the downstream monitoring location exceeded levels at the upstream downstream location in August 2022 and coincided with elevated STP effluent discharge levels. Generally, enterococci levels exceeded downstream levels during effluent discharges and exceeded the low risk NHMRC recreational GV. *E. coli* levels were significantly elevated in the effluent discharge in August 2022 and this was reflected in the downstream levels slightly exceeding the upstream monitoring location levels. Downstream monitoring location levels generally trended with upstream levels during STP effluent discharges on all other occasions.
- No toxin producing blue-green algae was detected at the downstream monitoring location during effluent discharges.

Seasonal discharges into the unnamed tributary of the Tamar River receiving environment occurred throughout the winter 2022 – early summer 2023 period and again in winter 2023 due to unavailability of the recycled water scheme. Effluent discharges appeared to have an impact on the receiving environment especially with ammonia and elevated total nitrogen and phosphorus.

22.6 Groundwater monitoring

Site status: Green – No sign STP impact (2022 report)

Exeter STP groundwater monitoring network consists of three bores ID numbers EXGW4-6. Due to timing and resourcing constraints no sampling was completed in the 2022-23 monitoring program. In response biannual sampling at the extended suite is scheduled for all bores in the 2023-24 groundwater monitoring program.

22.7 Inflow and infiltration (I&I)

The latest revision to the TasWater Inflow and Infiltration Management Plan includes details of the actions undertaken statewide to address I&I issues. Update to the actions completed will be provided in the next revision due September 2024.

A Multi Criteria Assessment was undertaken by TasWater in 2022 to prioritise I&I investigation and works state-wide. This catchment was ranked 49 out of 79 in priority.

22.8 Sludge and Biosolids

The latest revision to the Sewage Sludge Management Plan (SSMP) includes full details of the actions undertaken during the reporting period, the most recent sludge profiling results, and upcoming annual desludging program.

This STP was fully compliant with the 2022-23 SSMP.

No stockpiling occurs at this site.

Table 22-J: Desludging status and comments

Desludging Status	Comments
Low Priority	Desludging is outside of the current prioritisation planning schedule.

22.9 Non-compliance with other permit requirements

Table 22-K: EPN non-compliances

EPN Condition	Description of non-conformance	Future Actions to be taken
20 Effluent quality limits	Discharge compliance with permit limits	See section 22.3 Discharge compliance with permit limits and Performance Analysis
6 Lagoon maintenance	Floating matter present in Lagoon 1 corner. There was also some odour associated with this corner of the lagoon.	TasWater has engaged a contractor to remove floating matter from all lagoons. Photographic evidence provided to EPA to resolve non-compliance.
22 Wastewater Reuse	Discharge compliance with reuse permit limits	See section 22.4 Reuse Annual Reporting and Performance Analysis
1 Operations Manual	No contemporary Operational Procedures Manual	New SharePoint based solution for OPMMs currently being developed. First version to be implemented in FY24.

22.10 Complaints and incident reporting

No complaints received during 2022-23 reporting period.

There were no incidents during the 2022-23 reporting period.

22.11 Any other relevant information

For further information on Exeter STP please contact TasWater on 13 6992

www.taswater.com.au