

## 72. Turners Beach STP

### 72.1 Activity and report details

<b>Activity name</b>	Turners Beach STP		
<b>Activity address</b>	Turners Beach Road, Turners Beach		
<b>Permit number</b>	Licence to Operate - 3392	<b>Date of issue</b>	28/03/1991
<b>EPN</b>	10440/1	<b>Date of issue</b>	12/01/2021
<b>Treatment level</b>	Secondary Treatment		
<b>Authorised dry weather flows</b>	600 kL/day		
<b>Key influent source</b>	Residential		
<b>Contact person</b>	Kate Westgate (Manager Environmental Performance)		
<b>Report author</b>	Jake Crisp (Environmental Scientist)		
<b>Contact details</b>	Environment@taswater.com.au		
<b>Date of submission</b>	30 September 2024		

**Figure 72-1: Turners Beach Sewage Treatment Plant**



## 72.2 Monitoring and compliance summary

### 72.2.1 Flow data

**Table 72-A: Flow monitoring summary**

	Influent	Effluent	Reuse
Location name	Inlet Sample Point	Forth River	No reuse scheme
Coordinates	E 436570 N 5442607	E 426696 N 5442386	NA
Method of measurement	In line meter	Estimation based on influent	NA
Date of last calibration/validation (if applicable).	28/09/2023	NA	NA

**Table 72-B: Annual flow and rainfall data**

Month	Average daily influent volume (kL/day)	Rainfall (mm/month) BOM Station ID 91186	Discharge to waters total effluent volume (ML)	Discharge to reuse total effluent volume (ML)
July 2023	647	35.4	20.06	--
August 2023	663	82.2	20.54	--
September 2023	592	32.0	17.77	--
October 2023	524	33.4	16.24	--
November 2023	495	27.2	14.84	--
December 2023	524	85.0	16.24	--
January 2024	532	89.6	16.50	--
February 2024	470	2.2	13.64	--
March 2024	444	17.8	13.78	--
April 2024	460	47.0	13.81	--
May 2024	468	26.7	14.50	--
June 2024	465	41.6	13.95	--
Annual 2023-24	526	520.1	191.87	--
% of total discharge	--	--	100.0%	--

2023-24 monthly flow data was submitted directly to the EPA.

### 72.3 Bypass events

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

## 72.4 Discharge compliance with permit limits

**Table 72-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	15.0	30	--	40.0	10.0	8.5	10.0	750	40.0
90th percentile	--	--	--	--	--	--	--	--	--
50th percentile	--	--	--	--	--	--	--	--	--
Minimum	--	--	--	--	--	6.5	--	--	--
Samples analysed									
Number required	12	12	--	12	12	12	12	12	12
Number analysed	12	12	--	12	12	12	12	12	12
Statistical summary									
Maximum	23.6	105	--	29.6	3.8	9.5	7.0	4379	139.0
90th percentile	20.9	100	--	26.8	2.9	9.1	6.6	3017	74.7
50th percentile	8.0	47	--	20.6	1.1	8.1	4.7	1211	46.0
Minimum	0.2	5	--	11.3	1.0	7.5	3.9	86	4.0
EPN limit compliance									
% compliance with maximum	75%	25%	--	100%	100%	--	100%	50%	42%
% compliance with 90th percentile	--	--	--	--	--	--	--	--	--
% compliance with 50th percentile	--	--	--	--	--	--	--	--	--
% compliance with pH range	--	--	--	--	--	67%	--	--	--

**Table 72-D: Mass loads to the environment**

Parameter	EPN limit	Frequency	2023-24 result
Nitrogen (kg)	--	Annual	4022.9
Phosphorous (kg)	--	Annual	946.6
Method	Time weighted/grab sample method		

**Table 72-E: Performance analysis (discharge to environment)**

Parameter	Date(s) of non-compliance	Reasons for non-compliance	Actions to improve performance
E. coli	6/07/2023 14/12/2023 14/02/2024	14/03/2024 11/04/2024 14/06/2024	<p>Process modelling suggests that the Turners Beach lagoons have sufficient hydraulic retention time for meeting the effluent <i>E. coli</i> target. The reason for occasional non-compliances could be high inflow following rain events, which can cause short circuiting.</p> <p>Algae is believed to be the primary reason for elevated pH, BOD, and suspended solids.</p> <p>Through photosynthesis, algae absorb carbon dioxide and produce oxygen, which can increase the pH levels in the effluent. High algae count can contribute to elevated total suspended solids and BOD by increasing the biomass in the lagoons, which adds to the particulate matter suspended in the system.</p> <p>The main nitrogen removal process in lagoon systems is ammonia stripping which occurs at high temperature and pH levels. In colder months when the lagoons pH and temperature drop, ammonia stripping rate drops which can result in effluent non-compliance.</p>
BOD	12/10/2023 16/11/2023 14/12/2023 24/01/2024 14/02/2024	14/03/2024 11/04/2024 2/05/2024 14/06/2024	
pH	14/12/2023 24/01/2024	14/02/2024 2/05/2024	
TSS	14/12/2023 24/01/2024 14/02/2024 14/03/2024	11/04/2024 2/05/2024 14/06/2024	
Ammonia	6/07/2023 15/08/2023 21/09/2023		

No other parameters have had exceedances in the FY period.

## 72.5 Reuse annual reporting

No Recycled Water Scheme associated with this STP.

## 72.6 Ambient monitoring program

**Table 72-F: Program details**

<b>Program</b>	Routine quarterly ambient water quality monitoring in accordance with EPN.
<b>Status</b>	Quarterly ambient water quality monitoring completed during the reporting period.
<b>Update</b>	<p>Ambient water quality monitoring occurred at the upstream and downstream monitoring locations on a quarterly basis during the reporting period in accordance with EPN requirements.</p> <p>Additional biennial, seasonal (summer and autumn) water quality and biological monitoring was conducted in the Forth River Estuary receiving environment during the reporting period.</p> <p>Ongoing biennial, seasonal (summer and winter) ambient monitoring is planned with the next round scheduled for FY 2025-26.</p>
<b>Comments</b>	<p>Ambient water quality monitoring occurred during effluent discharges into the Forth River Estuary receiving environment in September &amp; December 2023, and March and June 2024. Key findings from the quarterly ambient water quality data review were:</p> <ul style="list-style-type: none"> <li>• Ammonia levels in the Forth River Estuary did not exceed the ANZG Default Guideline Value (tDGV) at any time at either the upstream or downstream monitoring locations. Downstream ammonia levels closely correlated with upstream ammonia levels with the upstream monitoring location exceeding the EPA DGVs for well flushed estuarine waters on one occasion in June 2024.</li> <li>• Nitrate levels at either the upstream or downstream monitoring locations did not exceed either the nitrate freshwater tDGV nor the EPA DGV for estuarine waters. Downstream nitrate levels closely correlated with upstream levels.</li> <li>• Total nitrogen levels downstream closely correlated with levels upstream with levels downstream slightly elevated above upstream levels in September 2023 and June 2024. The EPD DGV for nitrogen in estuarine waters was not exceeded at any time.</li> <li>• Total phosphorous levels downstream correlated with upstream levels with both exceeding the EPA DGV for estuarine waters in December 2023, but all levels were below the DGV on other monitoring occasions.</li> <li>• Total suspended solids levels upstream were elevated in December 2023 and March 2024 while downstream levels were elevated in March 2024 also.</li> <li>• Enterococci levels within the Forth River Estuary varied with upstream levels exceeding downstream levels. Enterococci levels upstream and downstream generally exceeded the EPA low risk guideline values for waters with current or potential recreational use especially in December 2023.</li> <li>• <i>E. coli</i> levels upstream generally exceeded downstream levels with a significant peak observed at the upstream location in December 2023 that exceeded the EPA low risk guideline values for waters with current or potential recreational use. Downstream levels were within the EPA low risk guideline on all occasions. use.</li> <li>• Potentially toxin producing blue-green algae (<i>Microcystis aeruginosa</i> and <i>Microcystis flos-aquae</i>) were detected at elevated levels in the STP effluent in March and June 2024, however no detectable levels were reported at the downstream (or upstream) monitoring location on these dates.</li> <li>• Aluminium (dissolved) levels downstream closely correlated with upstream levels with levels upstream and downstream exceeding the draft marine tDGV for 95% species protection in September 2023 and June 2024.</li> <li>• Copper (dissolved) levels upstream exceeding downstream levels on all monitoring occasions with upstream levels exceeding the draft marine tDGV for 95% species protection in December 2023 and June 2024.</li> <li>• Iron (total) levels upstream generally exceeded downstream levels and the draft ANZG Interim Working Group marine tDGV for 95% species protection in December 2023 and June 2024.</li> </ul>

Downstream levels exceed the draft marine tDGV in June 2024. Stream closely correlated with upstream levels with both upstream and downstream levels within on all occasions.

- Zinc (dissolved) levels at both the upstream and downstream monitoring locations were within the draft ANZG Interim Working Group marine tDGV for 95% species protection on all occasions with upstream levels slightly higher than downstream levels.

Based on the quarterly monitoring program, STP effluent discharges appear to have had minimal impact on the downstream monitoring location recreational Protected Environmental Values (PEVs) within the Forth River receiving environment, noting this monitoring location is > 1km downstream from the STP.

Additional ambient water quality and biological (benthic infauna and intertidal habitat survey) and sediment contamination monitoring was conducted in summer (December) 2023 and autumn (May) 2024. An Ambient Monitoring Report (AMR) is currently in preparation that will detail the investigation findings. The AMR will be submitted to the EPA on finalisation.

## 72.7 Groundwater monitoring

Site Status: Red

Turners Beach STP groundwater monitoring network consists of seven bores, ID numbers TRGW1-7. Bore ID's TRGW1, TRGW5 and 6 are located on the eastern boundary of the STP. Bore ID's TRGW2 and TRGW4 are located on the northern and southern boundary of Primary Lagoon respectively. Bore ID TRGW3 is located on the western boundary of the Faculty Lagoon. Bore ID TRGW7 is located south of the STP. Bi-annual sampling was completed at six of the seven bores in March and June 2024. Bore ID TRGW2 was unable to be located at time of sampling and was not sampled.

The groundwater monitoring report for the 2023-24 sampling event reported the data continued to suggest that seepage from the STP may be occurring in the southern end of the site. Bi-annual monitoring is recommended to continue due to the ongoing elevated concentrations of ammonia and potentially increasing trends at TRGW1, and TRGW3 monitoring locations and fluctuation concentrations of total nitrogen, it is to further understand and monitoring potential STP seepage risk to groundwater.

Bi-annual sampling at the extended analytical suite is scheduled to continue at all bores during the 2024-25 groundwater monitoring program. Surface water sampling at the extended analytical suite will also be completed at the STP lagoons on an annual basis during the program.

## 72.8 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 2024 to prioritise I&I investigation and works state-wide. This catchment was ranked 53 out of 108 in priority.

## 72.9 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 2023–24 SSMP.

No stockpiling occurs at this site.

**Table 72–G: Desludging status and comments**

Desludging status	Comments
Medium Priority	Desludging of lagoon 1 is scheduled to occur in 2027, as per the current prioritisation planning schedule.

## 72.10 Non-compliance with other permit requirements

**Table 72–H: EPN non-compliances**

EPN condition	Description of non-conformance	Future actions to be taken
EF2 Effluent quality limits for discharge to the Forth River	Discharge compliance with permit limit	See section 72.4 Discharge compliance with permit limits and Performance Analysis
EM2 Reuse Feasibility Study	Reuse Feasibility Study overdue.	Desktop reuse feasibility study completed in July 2021.
EM3 Discharge Management Plan	Discharge Management Plan overdue.	TasWater acknowledges the non-compliance associated with the DMP condition. We are working towards the intent of the EPN condition to prioritise discharge risk reduction projects in line with our EPA endorsed Wastewater Risk Management Plan and Price and Service Plan process.

## 72.11 Complaints and incident reporting

No complaints or incidents recorded in the FY2023–24 reporting period.

## 72.12 Any other relevant information

**Table 72–J: Projects or significant operational events that occurred in FY 2023–24:**

Project or significant operational event	Progress
Turners Beach STP Discharge Review	Feasibility in determining potential rationalisation of Turners Beach is included within the Ulverstone Regional Sewerage Strategy with a Strategic Options Report to be developed in PSP4.

For further information on Turners Beach STP please contact TasWater on 13 6992

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