

## 41 Perth STP

### 41.1 Activity and report details

Activity name	Perth STP		
Activity address	Midlands Highway, Perth		
Permit number	Licence to Operate - 3574	Date of issue	3/11/1988
EPN	654/1	Date of issue	31/01/2003
Treatment level	Secondary Treatment		
Authorised Dry Weather Flows	450 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 41--1: Perth Sewage Treatment Plant



## 41.2 Monitoring and compliance summary

### 41.2.1 Flow data

Table 41-A: Flow monitoring summary

	Influent	Effluent	Reuse
Location Name	Inlet	South Esk River	Scone property
Coordinates	E514010 N5395571	E513714 N5394791	E514002 N5395287
Method of Measurement	In line meter	In line meter	In line meter
Date of last Calibration/Validation (if applicable).	12/07/2022	23/05/2022	NA

Table 41-B: Annual flow and rainfall data

Month	Average Daily Influent Volume (kL/day)	Rainfall (mm/month) BOM Station ID 91167	Discharge to Waters Total Effluent Volume (ML)	Discharge to Reuse Total Effluent Volume (ML)
July 2022	613	19.6	0.00	1.66
August 2022	991	101.7	27.10	3.63
September 2022	894	52.8	23.91	2.90
October 2022	1013	120.6	27.45	3.94
November 2022	849	56.6	0.00	2.23
December 2022	691	44.2	0.00	1.50
January 2023	569	21.8	0.00	1.34
February 2023	587	28.4	0.00	1.41
March 2023	618	62.1	0.00	2.09
April 2023	643	43.8	0.00	0.87
May 2023	604	11.6	0.00	1.70
June 2023	775	24.8	0.00	1.99
Annual 2022-23	738	588.0	78.46	25.26
% of Total Discharge	--	--	75.6%	24.4%

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

### 41.2.2 Bypass events

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

### 41.3 Discharge compliance with permit limits

Table 41-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	8.5	10	--	50
90th percentile	--	--	--	--	--	--	--	--	--
50th Percentile	--	--	--	--	--	--	--	1000	--
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									
Max	37.5	138	--	56.6	5.0	9.1	9.1	24196	153.0
90th percentile	35.8	122	--	52.2	4.6	8.7	8.8	23330	110.3
50th percentile	23.8	76	--	39.3	3.4	8.1	7.4	1787	78.0
Min	10.0	28	--	30.9	1.0	7.3	5.5	201	24.5
EPN Limit Compliance									
% compliance with Maximum	58%	8%	--	50%	100%	--	100%	--	8%
% compliance with 90th percentile	--	--	--	--	--	--	--	--	--
% compliance with 50th percentile	--	--	--	--	--	--	--	42%	--
% compliance with pH range	--	--	--	--	--	83%	--	--	--

Table 41-D: Mass loads to the environment

Parameter	EPN Limit	Frequency	2022-23 result
Nitrogen (kg)	6800	Annual	3275.9
Phosphorous (kg)	1700	Annual	477.3
Method	Time weighted/Grab sample method		

Table 41-E: Performance Analysis (Discharge to environment)

Effluent compliance parameter	Date(s) of non-compliance	Reasons for non-compliance	Actions to improve performance
BOD	3/08/2022 1/09/2022	Perth STP is significantly overloaded. There was a significant amount of sludge accumulation in Lagoon 1 (prior to desludging in April 2023). These issues are believed to be the main reason for elevated BOD and TSS levels in colder months. Algae can also contribute to elevated BOD and TSS levels.	Lagoon 1 desludged to increase treatment capacity. The future site strategy is being reviewed under the Meander Valley regional strategy (see Section 41.11).
TSS	3/08/2022 1/09/2022		
Ammonia	3/08/2022		
Nitrogen	3/08/2022 1/09/2022		
E. coli	12-month 50 <sup>th</sup> percentile limit exceeded		

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

No other parameters had exceedances in the reporting period.

#### 41.4 Reuse Annual Reporting

Perth STP supplies treated effluent for irrigation purposes to the Perth recycled water scheme (RWS) located at the Scone property.

Table 41-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	138	9.1	24196
90th percentile	122	8.7	23330
50th percentile	76	8.1	1787
Min	28	7.3	201
Summary of results			
% compliance with Maximum	8%	--	75%
% compliance with 90th percentile	--	--	--
% compliance with 50th percentile	--	--	42%
% compliance with pH range	--	92%	--

Table 41-G: Performance analysis (Discharge to reuse)

Reuse Compliance Parameter	Date(s) of non-compliance	Reasons for non-compliance	Actions to improve performance
E. coli	7/03/2023 6/06/2023 12-month 50 <sup>th</sup> percentile limit exceeded	Prior to desludging in April 2023, the Perth treatment lagoons had a reduced hydraulic capacity resulting in short circuiting. Shorter lagoon retention decreases the time available to achieve disinfection of pathogens.  E. coli levels decreased following desludging, although increased flows during wet months again reduced lagoon HRT, resulting in elevated pathogens.	See Section 41.3
BOD	21/07/2022 17/11/2022 14/12/2022 16/01/2023 22/02/2023 7/03/2023 4/04/2023 2/05/2023 6/06/2023	High plant loading as well as sludge accumulation are the primary reasons for high effluent BOD.  Algal blooms in warmer months and increased flows in colder months also contribute to effluent non-compliance.	

Reuse Compliance Parameter	Date(s) of non-compliance	Reasons for non-compliance	Actions to improve performance
pH	14/12/2022	Algae is believed to be the primary reason for elevated pH due to CO <sub>2</sub> uptake during photosynthesis. Algae is a source of oxygen and is fundamental to lagoon treatment.	No specific actions undertaken in reporting period.

\* Non-compliances only identified for the times STP has discharged to reuse

Annual soil sampling was completed at five sites (P1, P2, P4-P6) at the RWS in April 2023. The annual compliance audit was completed in conjunction with the soil sampling. A summary of the findings of the programs is provided in

Table 41-H.

Table 41-H: Annual recycled water scheme compliance audit and soil monitoring summary

Program	Compliance audit	Soil monitoring
Compliance status	Compliant	Soil salinity and sodicity remain within recommended levels at all sites, exception of site P6 which remains non-saline and sodic. All sites recorded phosphorous levels above recommended range for agricultural production with exception of site P3. Site P1 phosphorous levels are considered excessive.
Comments	During audit customer advised they had been notified multiple times of potential BGA risk. Increased withholding times for stock was implemented and maintained until notification levels are below required limits.	Management strategies to minimise impact of sodicity at site P6 is recommended. Phosphorous fertiliser is not recommended at site P1. Soil data and recommendations are provided to the customer as part of the annual program. Excessive nutrient levels are attributed to fertiliser application and not recycled water irrigation due to low irrigation rates and low nutrients supplied by recycled water.

RWS groundwater status: Amber – Minor to moderate issue identified.

Perth RWS groundwater network consists of five groundwater monitoring bores ID numbers PEGW1-2 and PEGW5-7. Annual sampling was completed in June and July 2023. Biannual sampling was not completed due to timing and resourcing constraints.

Monitoring bore ID PEGW1 is showing an increasing trend in ammonia and above guideline criterion. No visual evidence of impact from recycled water irrigation on groundwater quality when long term charts are reviewed. Several bores recorded nutrient levels above adopted criterion but within previously seen ranges.

Biannual sampling is scheduled for all bores during the 2023-24 groundwater monitoring program.

#### 41.5 Ambient monitoring program

Table 41-I: Program details

Program	Seasonal Discharge Program - Routine monitoring during discharge to water
Status	Ambient monitoring completed during discharge events within the reporting period.

<b>Update</b>  <b>Comments</b>	<p>Ambient monitoring completed during discharge events within the reporting period.</p> <p>Ambient water quality monitoring was conducted during effluent discharges into the South Esk River receiving environment. Effluent discharges occurred from August – December 2022. Lagoon desludging activities were undertaken during March – May 2023 but no discharges to environment occurred during this period. Key findings from the ambient water quality monitoring data review (during discharge events) were:</p> <ul style="list-style-type: none"> <li>• The Default Guideline Value (DGV) for ammonia was significantly exceeded at the upstream monitoring location in September 2022 (TAN=14.1 mg/L) but the downstream monitoring location levels were well within the DGV and the EPA South Esk Catchment DGV on all monitoring occasions.</li> <li>• Nitrate levels both at the upstream and downstream monitoring location were within the DGV, but both locations exceeded the EPA DGV in September. Both upstream and downstream monitoring locations were within the EPA DGV on all other monitoring occasions.</li> <li>• Upstream total nitrogen levels were significantly elevated in September 2022 coinciding with other elevated parameters in this month at this location. A coinciding elevation in total nitrogen was not observed at the downstream monitoring location. Both upstream and downstream total nitrogen levels slightly exceeded the EPA DGV with downstream levels equivalent to upstream levels on all other monitoring occasions.</li> <li>• Upstream total phosphorus levels were significantly elevated in September 2022 coinciding with other elevated parameters in this month at this location. Both upstream and downstream total phosphorus levels slightly exceeded the EPA DGV with downstream levels slightly higher than upstream levels on all other monitoring occasions.</li> <li>• Total suspended solids (TSS) levels at the upstream monitoring location generally exceeded levels at the downstream upstream monitoring location with a significant peak in September and December 2022.</li> <li>• Enterococci levels at the upstream monitoring location exceeded levels at the downstream monitoring location on all occasions with downstream levels trending with upstream levels. Generally, both upstream and downstream enterococci levels exceeded the low risk NHMRC recreational GV on all occasions. <i>E.coli</i> levels correlated with enterococci levels with upstream levels exceeding downstream levels on all monitoring occasions.</li> <li>• No significant levels blue-green algae (species of concern) were detected at the downstream monitoring location during effluent discharges.</li> </ul> <p>Seasonal discharges into the South Esk River receiving environment occurred throughout the winter 2022 – early summer 2023 period due to unavailability of the recycled water scheme. Effluent discharges appeared to have had a minimal impact on the receiving environment due to sufficient mixing and dilution. There are likely impacts on recreational PEVs with both upstream and downstream pathogen levels exceeding both primary and secondary contact GVs. Water quality at the upstream monitoring location appears to have been occasionally affected by the outfall pipeline manhole overflow/surcharging and discharge pipeline blockage during discharge events however the impacts are localised only, with water quality downstream not affected.</p>
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#### 41.6 Groundwater monitoring

Site status: Amber – Some signs of STP impact

Biannual monitoring was completed at the two monitoring bores (ID's PEGW3-4) in June 2023. Biannual sampling was unable to be completed due to timing and resourcing constraints.

Bore ID PEGW3 recorded exceedances of adopted guideline criterion for total nitrogen, total phosphorous and nitrate. Bore ID PEGW4 exceeded for ammonia.

Biannual sampling is scheduled at all bores at the extended analytical suite for both bores in the 2023-24 groundwater monitoring program. Annual sampling of the STP lagoons is scheduled to assist

in water classification assessment. Sampling of the potential receiving environment (South Esk River) will be reviewed in 2023-24 for possible inclusion in the 2024-25 monitoring program.

#### 41.7 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 64 out of 79 in priority.

#### 41.8 Sludge and Biosolids

The latest revision to the Sewage Sludge Management Plan (SSMP) includes full details of the desludging 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 41-J: Desludging status and comments

Desludging Status	Comments
Desludging completed.	3,912.5 wet tonnes removed from the lagoons.

Table 41-K: Desludging solids end use

Quantity (DST)	Average solids content	Stabilisation method	Stabilisation Grade	Contamination Grade	Biosolids Classification	End use destination
352.48	9.0%	Anaerobic digestion	B	B	2	Scone Farm

#### 41.9 Non-compliance with other permit requirements

Table 41-L: EPN non-compliances

EPN Condition	Description of non-conformance	Future Actions to be taken
1 Operational Manual	No contemporary Operational Procedures Manual	New SharePoint based solution for OPMs currently being developed. First version to be implemented in FY24
23 Effluent quality limits	Discharge compliance with permit limits	See section 41.3 Discharge compliance with permit limits and Performance Analysis

#### 41.10 Complaints and incident reporting

No complaints or incidents reported during the FY2022-23 reporting period.



#### 41.11 Any other relevant information

Table 41-M: Projects or significant operational events that occurred in FY 2022-23

Project or significant operational event	Progress
Meander Valley Sewerage Strategy (MVSS)	Perth is currently being investigated for rationalisation within MVSS. A MVSS Strategic Business Case and Strategic Options Report will be completed in FY 2023/24.

For further information on the Perth STP please contact TasWater on 13 6992

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