

19. Deloraine STP

19.1 Activity and report details

Activity name	Deloraine STP		
Activity address	Off Racecourse Drive, Deloraine		
Permit number	Permit Conditions Environmental - 6237	Date of issue	2/07/2002
EPN	7775	Date of issue	21/12/2011
Treatment level	Secondary Treatment		
Authorised dry weather flows	860 kL/day		
Key influent source	Residential/Industrial		
Contact person	Kate Westgate		
Report author	Luisa Romero (Environmental Scientist)		
Contact details	Environment@taswater.com.au		
Date of submission	30 September 2024		

Figure 19-1: Deloraine Sewage Treatment Plant



19.2 Monitoring and compliance summary

19.2.1. Flow data

Table 19–A: Flow monitoring summary

	Influent	Effluent	Reuse
Location name	Inlet	Meander River	No reuse scheme
Coordinates	E 472073 N 5403613	E 472240 N 5403970	NA
Method of measurement	Level sensor	Level sensor	NA
Date of last calibration/validation (if applicable).	05/08/2024	05/08/2024	NA

Table 19–B: Annual flow and rainfall data

Month	Average daily influent volume (kL/day)	Rainfall (mm/month) BOM Station ID 91227	Discharge to waters total effluent volume (ML)	Discharge to reuse total effluent volume (ML)
July 2023	1,472	99.4	45.64	--
August 2023	1,397	91.0	43.32	--
September 2023	889	29.4	26.66	--
October 2023	632	48.6	19.58	--
November 2023	640	47.2	19.21	--
December 2023	734	80.8	22.75	--
January 2024	708	79.8	21.94	--
February 2024	654	5.0	18.97	--
March 2024	644	19.0	19.96	--
April 2024	644	69.6	19.31	--
May 2024	618	50.2	19.16	--
June 2024	714	92.4	21.41	--
Annual 2023–24	816	712.4	297.90	--
% of total discharge	--	--	100.0%	--

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

19.3 Bypass events

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

19.4 Discharge compliance with permit limits

Table 19–C: Discharge compliance with permit limits

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	5.0	15	--	15.0	10.0	8.5	8.0	200	20.0
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	11.2	58	--	19.4	1.9	10.6	3.7	275	227.0
90th percentile	7.2	51	--	17.7	1.6	10.4	2.9	97	138.4
50th percentile	3.0	16	--	9.6	1.0	9.0	1.3	31	37.0
Minimum	0.0	5	--	5.3	1.0	7.0	0.2	10	4.0
EPN limit compliance									
% compliance with maximum	83%	50%	--	75%	100%	--	100%	92%	33%
% compliance with 90th percentile	--	--	--	--	--	--	--	--	--
% compliance with 50th percentile	--	--	--	--	--	--	--	--	--
% compliance with pH range	--	--	--	--	--	42%	--	--	--

Table 19–D: Mass loads to the environment

Parameter	EPN limit	Frequency	2023–24 result
Nitrogen	--	Annual	2929.8
Phosphorous (kg)	--	Annual	364.1
Method	Time weighted/Grab sample method		

Table 19–E: Performance analysis (discharge to environment)

Effluent compliance parameter	Date(s) of non-compliance		Reasons for non-compliance	Actions to improve performance
pH	3/10/2023 7/11/2023 9/01/2024 6/02/2024	5/03/2024 9/04/2024 7/05/2024	Algae is believed to be the primary reason for elevated pH due to CO ₂ uptake during photosynthesis. Algae is a source of oxygen and is fundamental to lagoon treatment.	No specific action taken
TSS	3/10/2023 7/11/2023 9/01/2024 6/02/2024	5/03/2024 9/04/2024 7/05/2024 4/06/2024	Algae and significant sludge accumulation in the polishing lagoons are believed to be the primary reason for non-compliant BOD, E. coli and TSS. Algae contributes directly to effluent TSS and BOD. Most of the non-compliant results were in warmer months when algal blooms occur. Shading from algae can also decrease UV disinfection of pathogens.	Desludging Lagoon 1 and 2 scheduled to occur in 2025, as per the current prioritisation planning schedule.
BOD	3/10/2023 7/11/2023 9/01/2024	6/02/2024 5/03/2024 7/05/2024	High sludge accumulation decreases the effective lagoon treatment capacity, resulting in high effluent BOD and E. coli. These issues are exacerbated during colder months when high inflows can contribute to lagoon short-circuiting.	
E. coli	4/07/2023			

Effluent compliance parameter	Date(s) of non-compliance	Reasons for non-compliance	Actions to improve performance
Ammonia	3/10/2023 7/11/2023	<p>The ability of the treatment process to achieve nitrification at times is inhibited by power faults and lack of pH correction. Power faults can cause aerators to be offline for extended periods (e.g., over weekends), leading to an accumulation of ammonia and decreased biomass capacity. Aeration tank pH is often low due to alum dosing for phosphorus removal, below to ideal range of 7.5 to 8.5 to maximise nitrification.</p> <p>Effluent ammonia is typically higher than aeration tank decant levels, suggesting that sludge accumulation within the polishing lagoons is releasing ammonia back into the effluent.</p>	<p>Desludging Lagoon 1 and 2 scheduled to occur in 2025, as per the current prioritisation planning schedule.</p> <p>Investigate substituting alum for aluminium chlorohydrate due to lower consumption of alkalinity.</p>
Nitrogen	7/11/2023 6/02/2024 5/03/2024	Elevated nitrogen is likely caused by insufficient denitrification in IDEAL 1 due to over-aeration. The site lacks DO control, requiring the aerators to run on a timer rather than a setpoint target.	No specific action taken

No other parameters had exceedances in the reporting period.

19.5 Reuse annual reporting

No Recycled Water Scheme associated with this STP.

19.6 Ambient monitoring program

Table 19–F: Program details

Program	Deloraine AMP and in accordance with EPN Conditions
Status	Ambient water quality and biennial, seasonal (spring/autumn) biological (AusRivAS) monitoring undertaken within the Meander River receiving environment.
Update	Ambient water quality (monthly) and biennial, seasonal (spring/autumn) biological (AusRivAS) monitoring has been undertaken within the Meander River receiving environment during the reporting period.
Comments	<p>Monthly ambient water quality and biological monitoring in spring (September) 2023 and autumn (March) 2024 was completed within the Meander River receiving environment. Key findings from the ambient water quality and biological monitoring are summarised below:</p> <ul style="list-style-type: none"> • Ammonia levels in the Meander River did not exceed the ANZG Default Guideline Value (tDGV) at any time at the upstream or downstream monitoring locations during effluent discharges. Downstream ammonia levels correlated with upstream ammonia levels within the Meander River with downstream levels only exceeding the EPA Meander Catchment DGVs when upstream levels exceeded the DGVs mostly during the winter months and likely high river flows. • The nitrate EPA DGV was exceeded during the winter higher river flow months with downstream levels slightly higher but generally correlating with upstream levels. The nitrate tDGV was not exceeded at any time, either upstream or downstream. • Total nitrogen levels downstream generally correlated with levels upstream except in January and February 2024 when downstream levels were elevated above the EPA DGVs • Total phosphorous levels downstream correlated with upstream levels with both exceeding the EPA DGV the majority of the time. An elevation above upstream levels was observed downstream in January 2024. • Total suspended solids levels downstream were equivalent to upstream levels and within the EPA DGV at all times. • Enterococci levels within the Meander River varied with upstream levels sometimes exceeding downstream levels and vice versa. Both levels upstream and downstream generally exceeded the EPA low risk guideline values for waters with current or potential recreational use especially during the summer months, although effluent levels were lower than both ambient monitoring locations during the same period. • E. coli levels upstream generally exceeded and correlated with downstream levels with a significant peak observed at both locations in January 2024. This did not coincide with an increased level in the STP effluent discharge. Generally, E. coli levels at both the upstream and downstream monitoring locations exceeded the EPA low risk guideline values for waters with current or potential recreational use. • Potentially toxin producing blue-green algae (BGA) were detected at the downstream monitoring location during December 2023 to May 2024 but at levels well below the EPA/NHMRC low alert level classification for recreational water. STP effluent levels were significantly elevated with BGA during the same period. Toxicity testing undertaken in May 2024 identified no detectable levels of microcystin toxins in the effluent or at the downstream monitoring location within the Meander River. <p>Effluent discharges appear to be having minimal impact on water quality within the Meander River receiving environment with sufficient mixing and dilution due to river flows. Water quality downstream of the effluent discharge mostly correlated with upstream water quality that is likely affected by agriculture and other inputs into the river system, as well as the STP effluent discharge. Elevated levels of nutrients and pathogens were observed in the Meander River in January and February 2024, but this did not correlate with effluent quality being discharged at the time. Water quality at both the upstream and downstream monitoring locations poses a risk to recreational Protected Environmental Values in the Meander River.</p>

The findings of the biennial seasonal biological monitoring are summarised below:

- For spring 2023, AusRivAS analyses placed upstream sites in the lower range of impairment band B ('significantly impaired'), while downstream sites were placed in the mid-range of impairment band B ('significantly impaired').
- For autumn 2024, AusRivAS analyses placed both upstream and downstream sites in the lower range of impairment band B ('significantly impaired').
- The results of AusRivAS analyses for both spring 2023 and autumn 2024 suggest a slight improvement in several AusRivAS indicators at sites downstream of the STP outfall.
- This apparent improvement downstream of the STP outfall may reflect localised characteristics of the sample sites, or alternatively it may reflect moderate organic enrichment from the STP effluent discharge which can lead to an increase in macroinvertebrate abundance and diversity.

19.7. Groundwater monitoring

Site Status: Amber – (2022–23 report)

Deloraine STP groundwater monitoring network consists of six groundwater monitoring bores, ID numbers DLGW1 – 6. One round of sampling (6-monthly) was completed in May 2024 at monitoring bore ID's DLGW2–6. No sampling was taken from bore ID DLGW1 due to access restrictions. The second (annual) sampling round was not completed. TasWater has put measures in place for the 2024–25 sampling program to address scheduling and resourcing delays experienced in recent years.

Following delays, the 2023–24 report will be finalised and available in October 2024. Any actions to address identified potential issues will be determined following the hydrogeological review.

Biannual sampling at the extended analytical suite is scheduled to resume at all monitoring bores during the 2024–25 groundwater monitoring program.

19.8. 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 52 out of 108 in priority.

19.9. 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 2022–23 SSMP.

No stockpiling occurred at this site.

Table 19-G: Desludging status and comments

Desludging status	Comments
High Priority	Desludging Lagoon 1 and 2 scheduled to occur in 2025-26, as per the current prioritisation planning schedule.

19.10. Non-compliance with other permit requirements

Table 19-H: EPN Non-compliances

EPN condition	Description of non-conformance	Future actions to be taken
EM1 Effluent Management	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.
EM3 Discharge Management Plan	Discharge Management Plan overdue	

19.11. Complaints and incident reporting

No complaints or incidents reported during the FY 2023-24 reporting period.

19.12. Any other relevant information

Table 19-I: Projects or significant operational events that occurred in FY 2023-24:

Project or significant operational event	Progress
Meander Valley Sewerage Strategy (MVSS)	Deloraine is currently being investigated for rationalisation within the MVSS. A MVSS Strategic Business Case has been completed identifying preferred options and priorities. Work package Detailed Business Cases for specific prioritised options will be developed within PSP4/5 period.
Deloraine Inlet Screen replacement	Completed and operational.

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

www.taswater.com.au