

## 10 Cambridge STP

### 10.1 Activity and report details

Activity name	Cambridge STP		
Activity address	Hobart International Airport Pty Ltd Lease, Cambridge		
Permit number	NA	Date of issue	NA
EPN	7447/3	Date of issue	22/10/2019
Treatment level	Tertiary - (Nitrogen + Phosphorus)		
Authorised Dry Weather Flows	800 kL/day		
Key Influent Source	Residential/Industrial 2 x Category 3 Customer, 5 x Category 4 Customer		
Contact person	Kate Westgate		
Report author	George Fitzgibbon		
Contact details	Environment@taswater.com.au		
Date of submission	30 September 2023		

Figure 10-1: Sewage Treatment Plant



## 10.2 Monitoring and compliance summary

### 10.2.1 Flow data

Table 10-A: Flow monitoring summary

	Influent	Effluent	Reuse
Location Name	Inlet	Sinclair's Creek to Pitt Water	Effluent Reuse Scheme - Coal River
Coordinates	E 541665 N 5256539	E 541895 N 5256954	E 541640 N 5256568
Method of Measurement	In Line meter	In Line meter	In Line meter
Date of last Calibration/Validation (if applicable).	18/09/22	18/09/22	18/09/22

Table 10-B: Annual flow and rainfall data

Month	Average Daily Influent Volume (kL/day)	Rainfall (mm/month) BOM Station ID 94082	Discharge to Waters Total Effluent Volume (ML)	Discharge to Reuse Total Effluent Volume (ML)
July 2022	765	38.2	15.65	10.52
August 2022	984	99.4	25.11	3.85
September 2022	836	78.6	17.16	11.35
October 2022	1,002	115.8	15.00	11.78
November 2022	887	66.4	7.05	20.62
December 2022	881	101.2	14.44	13.41
January 2023	601	4.4	9.09	17.34
February 2023	683	54.6	0.00	20.89
March 2023	628	30.8	7.97	17.48
April 2023	635	34.4	4.71	16.94
May 2023	542	25.6	3.57	15.98
June 2023	684	38.8	10.23	11.60
Annual 2022-23	761	688.2	129.97	171.78
% of Total Discharge	--	--	43.1%	56.9%

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

## 10.2.2 Bypass events

There were 7 bypass events associated with the STP during the reporting period.

Table 10-C: Bypass events summary

<b>Bypass ID:</b>	CABST01-OND				
<b>Bypass description:</b>	Pumped bypass from storm balancing tanks to outfall				
<b>Treatment bypassed:</b>	Secondary Treatment, Filtration, Disinfection (UV & Chlorine)				
<b>Treatment level of impacted effluent:</b>	Screened, bypass chlorination				
<b>Flows exceeding:</b>	~18.5 L/s				
<b>Discharge location:</b>	Lower Pittwater via Sinclairs Creek: 541895E, 5256954N (GDA94)				
<b>Start date / time</b>	<b>End date / time</b>	<b>Duration</b>	<b>Volume estimate</b>	<b>Cause</b>	<b>Response actions</b>
14/08/22 16:36	14/08/22 19:22	2.8 h	261 kL	Rainfall Event	No specific actions undertaken
16/08/22 13:39	18/08/22 16:02	50.4 h	5489 kL	Rainfall Event	No specific actions undertaken
03/11/22 14:11	03/11/22 14:30	0.3 h	35 kL	Rainfall Event	No specific actions undertaken
14/12/22 01:39	15/12/22 01:19	23.7 h	1824 kL	Rainfall Event	No specific actions undertaken
15/12/22 08:09	15/12/22 21:02	12.9 h	512 kL	Rainfall Event	No specific actions undertaken
16/12/22 17:32	16/12/22 18:22	0.8 h	98 kL	Rainfall Event	No specific actions undertaken
17/12/22 07:02	17/12/22 12:32	5.5 h	117 kL	Rainfall Event	No specific actions undertaken

### 10.3 Discharge compliance with permit limits

Table 10-D: 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	2	10	1.0	15	5	8.5	3	200	10
90th percentile	1	5	--	10	2	--	1	--	5
50th Percentile	0.5	--	--	7	1	--	0.5	10	4
Minimum	--	--	--	--	--	6.5	--	--	--
Samples analysed									
Number required	12	12	12	12	12	12	12	12	12
Number analysed	12	12	12	12	12	12	12	12	12
Statistical summary									
Max	0.4	5	0.75	14.7	1.0	8.1	2.4	41	4.0
90th percentile	0.4	5	0.70	14.0	1.0	7.9	1.8	19	4.0
50th percentile	0.1	5	0.45	9.7	1.0	7.7	0.1	10	4.0
Min	0.1	5	0.10	6.8	1.0	6.9	0.1	10	4.0
EPN Limit Compliance									
% compliance with Maximum	100%	100%	100%	100%	100%	--	100%	100%	100%
% compliance with 90th percentile	100%	100%	--	50%	100%	--	83%	--	100%
% compliance with 50th percentile	100%	--	--	8%	100%	--	75%	83%	100%
% compliance with pH range	--	--	--	--	--	100%	--	--	--

Note: Percentages reflective of complete data set for the year

Table 10-E: Mass loads to the environment

Parameter	EPN Limit	Frequency	2022-23 result
Nitrogen (kg)	--	Annual	
Phosphorous (kg)	--	Annual	
Method	Flow weighted/Composite method		

Table 10-F: Performance Analysis (Discharge to environment)

Effluent compliance parameter	Date(s) of non-compliance	Reasons for non-compliance	Actions to improve performance
Nitrogen	12-month 90 <sup>th</sup> percentile limit exceeded	The high proportion and variability of trade waste discharges affects the ability for the process to effectively and consistently achieve the required Nitrogen and Phosphorus removal.	No specific actions
	12-month 50 <sup>th</sup> percentile limit exceeded		
Phosphorus	12-month 90 <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.

## 10.4 Compliance with Airport Guidelines

Table 10-G: Compliance with Airport Guidelines

Parameter	Ammonia <sup>‡</sup>	Lead	Phosphate	E coli*	TKN	Zinc
Regulation limit	mg/L	mg/L	mg/L	MPN/100mL	mg/L	mg/L
AEP Reg	0.02	0.001	0.01	150	0.1	0.005
ANZECC (95%) Freshwater	0.9	--	--	--	--	0.008
ANZECC Marine	--	--	0.05	150	--	0.05
Samples analysed						
Number required	12	12	12	12	12	12
Number analysed	12	1	12	12	12	1
Statistical summary						
Max	0.4	0.0007	2.4	20	3.2	0.06
90th percentile	0.4	--	1.8	20	2.9	--
50th percentile	0.1	--	0.1	10	1.5	--
Min	<0.1	--	<0.1	<10	0.5	--
EPN Limit Compliance						
% compliance with AEP Reg	0%	100%	0%‡	100%	0%	0%
% compliance with ANZECC (95%) Freshwater	100%	--	--	--	--	0%
% compliance with ANZECC Marine	--	--	0%‡	100%	--	0%

\* Total coliform results unavailable

‡ Minimum detection limit for analysis is 0.1 mg/L.

Table 10-H: Compliance with Airport Guidelines

Parameter	PFOS	PFAS
NEMP freshwater/interim marine limit	µg/L	µg/L
99% Species Protection	0.00023	19
95% Species Protection	0.13	220
90% Species Protection	2	632
80% Species Protection	31	1824
Samples analysed		
Number required	12	12
Number analysed	3	3
Statistical summary		
Max	0.17	0.74
90th percentile	0.17	0.72
50th percentile	0.16	0.63
Min	0.06	0.3
EPN Limit Compliance		
% compliance with 99% Limit	0%	100%
% compliance with 95% Limit	33%	100%
% compliance with 90% Limit	100%	100%
% compliance with 80% Limit	100%	100%

## 10.5 Reuse Annual Reporting

The Rokeby, Rosny, Cambridge and Richmond STP's supply recycled water for irrigation purposes to the Clarence recycled water scheme. Currently twenty-six properties in the Coal Valley and Seven Mile Beach area connected to the recycled water scheme. The scheme operates under the current 2019-2024 Environmental Management Plan.

Table 10-I: Reuse Compliance Summary

Parameter	BOD5	pH	E coli
Permit/EPN limit	mg/L	Units	MPN/100 mL
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	5	8.1	20
90th percentile	5	7.9	20
50th percentile	5	7.7	10
Min	5	6.9	10
EPN Limit Compliance			
% compliance with Maximum	100%	--	100%
% compliance with 90th percentile	--	--	--
% compliance with 50th percentile	--	--	100%
% compliance with pH range	--	100%	--

No parameters exceeded for the period.

Annual soil sampling was completed at thirty-four sites on twenty properties across the Clarence RWS in late June and July 2022. The distribution of the sampling sites was based on the established sampling program and consideration of the irrigation application rates for the past irrigation and proposed coming irrigation season. One site (36 BEL) was removed as no recycled water irrigation occurred for two consecutive years. Annual compliance audits were completed at twenty-two properties in June and July 2022. Four properties connected to the scheme but currently not receiving recycled water were excluded from the compliance audit program. One property was returned to the program. Mostly completed by phone, field observations were conducted in conjunction with the soil sampling. A summary of the findings of the programs is provided in the below table.

Table 10-J: Annual recycled water scheme compliance audit and soil monitoring summary

Program	Compliance audit	Soil monitoring



<p><b>Compliance status</b></p>	<p>Seven properties (32%) recorded full compliance with IEMP. Ten properties (45%) recorded inadequate signage (minor non-compliance).</p> <p>Notable non-compliance are as follows:</p> <ul style="list-style-type: none"> <li>Recycled water irrigation outside IEMP requirements (withholding times and/or buffer zones): <ul style="list-style-type: none"> <li>Llanherne Golf Club - immediate measures in place whilst pumping infrastructure upgrades are completed.</li> <li>Royal Hobart Golf Club - immediate measure in place to address risk</li> <li>Tasmania Golf Club - immediate measures in place with future infrastructure upgrades currently being considered to address non-compliance.</li> </ul> </li> <li>Riversdale: (Outstanding) Discharge of recycled water from pipeline flushing and filter back flushing to address water quality issues outside IEMP.</li> <li>Craigow: Recycled water location of and irrigation method outside IEMP and inadequate backflow prevention on a connected but unused line. Immediate measures in place to address irrigation requirements.</li> </ul>	<p>Average EC<sub>se</sub> and Cl levels fluctuate between years, ranging from non-saline to slightly saline. There is no long-term trend.</p> <p>Average EC<sub>se</sub> and Cl levels in 2022 are similar to the previous year. There is no long-term trend.</p> <p>ESP level dropped below 5% in 2021 (4.3%) for the first time since the monitoring program began and remains unchanged in 2022. No long-term trend identified.</p> <p>6% sites considered saline, 9% sites considered slightly saline and 85% sites within recommended range. 21% sites considered sodic, 9% sites considered borderline sodic and 71% sites within recommended range.</p> <p>No long-term trend in average S.</p> <p>Increasing long-term trend in average P and K since 2014, with P increasing at a slower rate than K. Average P and K levels remain similar to the previous year.</p> <p>Average P level is high, average K level is moderate, and average S level is low to moderate.</p>
<p><b>Comments</b></p>	<p>Adequate signage remains the main non-compliance across the scheme.</p> <p>Golf Club interim measures are currently in place. Any changes to pumping infrastructure are likely to require an update to the site IEMP to permanently address change in practices.</p> <p>Management of the outstanding matter at Riversdale has occurred during the reporting period with a reduction of frequency of practice and IEMP will be require to reflect practice and management requirements.</p> <p>A number of TasWater owned recycled water meters are inoperable, faulty or leaking. TasWater are currently replacing meters under a metering program. Meters have been procured and installation scheduled under the program.</p>	<p>Overall, soil health and fertility do not appear to be adversely impacted through recycled water irrigation.</p> <p>From a soil structure perspective, sodicity is the main soil concern, a review of recycled water quality (salinity and SAR) indicates a very-light risk of soil permeability loss resulting from the application of recycled water and highly unlikely future sodicity issues will develop due to recycled water application.</p> <p>The elevated nutrient levels (average P and K) are attributed to other nutrient sources and intensification of land use, not recycled water irrigation.</p> <p>Five yearly soil metals analysis was completed in 2020. Next sampling is due in 2025.</p>

Key: K= Potassium; P=Phosphorous; S = Sulphur; EC<sub>se</sub> = Electrical Conductivity; Cl = Chloride; SAR = Sodium Absorption Ratio

### RWS groundwater site status: Amber

The Clarence RWS groundwater monitoring network currently consists of thirty-two monitoring bores across sixteen properties. Four bores (ID's CL-RRPGW9, CL-SHGW2, CL-TGCGW3 and CL-RHCGW4) are associated with recycled water storage dams. One round of sampling was completed in August and September 2022. Due to resource and timing constraints the second round of sampling was unable to be completed in 2023. Monitoring bore CL-UFGW8 has been removed from the

monitoring program due to irreparable damage and bore ID CL-RPGW7 could not be sampled due to access constraints.

Groundwater chemistry appears to be generally consistent with previous years. Seven properties recorded at least one monitoring bore which exceeded a guideline criterion although unlikely attributed to recycled water irrigation. The significant issue identified in previous report was investigation with a piper plot analysis showing the irrigation water is chemically different from groundwater. Nine properties recorded no evidence or limited evidence recycled water impacting groundwater.

Biannual monitoring will continue at all monitoring bores during the 2023-24 monitoring program.

## 10.6 Ambient monitoring program

Table 10-K: Program details

<b>Program</b>	Routine ambient monitoring in accordance with EPN
<b>Status</b>	Ongoing monthly ambient water quality monitoring and biennial sediment and biological monitoring.
<b>Update</b>	Completed monthly ambient water quality monitoring during the reporting period. The biennial sediment and biological monitoring report 2022 was submitted in May 2023. The 2022/23 AMR is in preparation and will be submitted later in 2023.
<b>Comments</b>	<p>Discharge to water occurred each month throughout FY 2022-23 except for February. Ambient water quality monitoring was undertaken in accordance with EPN requirements monthly during discharges. Sediment and Biological monitoring was undertaken in the reporting period.</p> <p>A summary of the ambient monitoring is provided below:</p> <ul style="list-style-type: none"> <li>• Dissolved nutrient parameters were periodically elevated above DGVs at most monitoring sites across the receiving environment.</li> <li>• Phosphorous, DRP, nitrate and nitrite were notably elevated within the discharge channel (site CAMW01), relative to the other sampling sites.</li> <li>• Notable spikes in multiple nutrient parameters occurred at most sites throughout the monitoring period, however these did not appear to clearly correlate with preceding rainfall levels or effluent concentrations.</li> <li>• Microbial concentrations were regularly elevated above NHMRC (2008) DGVs for protection of recreational water quality within the discharge channel and periodically exceeded DGVs at other sites across the Pittwater receiving environment.</li> <li>• Similarly, to the conclusions of previous AMRs, E. coli concentrations showed some correlation with distance from the discharge channel across the immediate receiving environment but little correlation with effluent concentrations.</li> <li>• Microbial concentrations did not appear to correlate with preceding rainfall levels or monthly effluent quality measures taken at the STP.</li> <li>• There appeared to be no clear relationship between infauna community composition or abundance with increasing distance from the outfall creek. A combination of the lack of a gradient effect away from the discharge channel, and no obvious distinction between communities at regular monitoring sites and the reference sites, suggests that changes in infauna communities in 2022 were driven by background environmental or anthropogenic impacts in the broader receiving environment more so than the localised STP discharge.</li> <li>• Overall macrophyte cover was higher in 2022 than previous sampling years and contrary to some previous sampling years, no clear correlation between macrophyte cover and distance to the discharge channel was evident.</li> </ul> <p>Results are similar to the previous year. Sinclair's creek and the Pittwater receiving waters are influenced by multiple factors, including both anthropogenic and natural inputs.</p>

## 10.7 Groundwater monitoring

There are no groundwater monitoring programs required for Cambridge STP.

## 10.8 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 2022 to prioritise I&I investigation and works state-wide. This catchment was ranked 3 out of 79 in priority (high).

Works this FY include:

- Detailed property investigations have commenced in two sub-catchments as recommended during flow monitoring completed previously.
- Manhole inspections have been completed.
- Commencement of detailed property investigations (including vapour testing). Some minor defects identified but no major contributors.

## 10.9 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 is fully compliant with the 2022-23 SSMP.

Biosolids are removed regularly from site, no stockpiling occurs.

Table 10-L: Biosolids sludge classification

Month	Number of Samples	Maximum (mg/kg)	Mean (mg/kg)	Minimum (mg/kg)	BACC (mg/kg)	Contaminant Classification
Arsenic	12	7.0	5.6	4.2	7.2	A
Cadmium	12	1.7	1.2	0.8	1.7	B
Chromium	12	36.2	23.1	13.5	38.7	A
Copper	12	224.0	153.7	103	243.4	B
Lead	12	32.1	20.0	12.8	32.7	A
Mercury	12	0.9	0.3	0.04	0.8	A
Nickel	12	23.7	16.3	10.2	25.9	A
Zinc	12	394.0	269.4	191	368.5	B

Table 10-M: Volume and disposal destination

Quantity (DST)	Average solids content	Stabilisation method	Stabilisation Grade	Contamination Grade	Biosolids Classification	End use destination
113.68	15.3%	Hydrated Lime	B	B	2	Richmond Farm. Coronation Hotel-Runnymede. Delmore Farm.

						Flexmore Park Farm. Whitemarsh Farm-Runnymede.
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Notes: DST = Dry solid tonne. U/C = Unclassified

## 10.10 Non-compliance with other permit requirements

Table 10-N: EPN non-compliances

EPN Condition	Description of non-conformance	Future Actions to be taken
OP2 Operational Procedures and Maintenance Manual	No contemporary Operational Procedures Manual	New SharePoint based solution for OPMMs currently being developed. First version to be implemented in FY2023-24.
EF3 Effluent quality limits for discharge to Sinclairs Creek	See section 10.3 Discharge compliance with permit limits and Performance Analysis	See section 10.3 Discharge compliance with permit limits and Performance Analysis

## 10.11 Complaints and Incident Reporting

No complaints were recorded during the 2022-23 reporting period.

Table 10-O: Incident Reporting

Date	Category	Details	Mitigation Actions
15/03/2023	Spill	TasWater informed EPA of a significant spill event from the Cambridge rising main to the sewage treatment plant (STP) at 11:07 on 15 March 2023. Daily checks by the operator at the STP revealed no flow was being received into the STP. An estimated 330-460 kilolitres (kL) of sewage residue was deposited at the corner of Grueber Avenue and Golf Road, Cambridge around the 14 March 2023.	Spill was immediately attended and mitigation actions put in place. Sucker truck was deployed to remove volume and pipe break was rectified. Alarming system at the STP was updated to ensure similar events are identified earlier.

## 10.12 Any other relevant information

Table 10-P: Projects or significant operational events that occurred in FY 2022-23:

Project or significant operational event	Progress
Inflow and Infiltration works	Ongoing investigation and rectification work during FY2023 as one of the priority networks
Pittwater Regional Sewerage Strategy (PRSS)	Cambridge STP is currently included within the PRSS. A Strategic Business Case is continuing to be developed in FY2022-23 to determine the future outcome of this STP.

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

[www.taswater.com.au](http://www.taswater.com.au)