



# Southern Beaches Recreational Water Quality

# Annual Report

2024-2025

Prepared By :

**Rachel Tenni**

in accordance with the Public Health  
Act 1997 and Recreational Water  
Quality Guidelines - August 2007

(03) 6269 0000

[sorell.council@sorell.tas.gov.au](mailto:sorell.council@sorell.tas.gov.au)

[www.sorell.tas.gov.au](http://www.sorell.tas.gov.au)





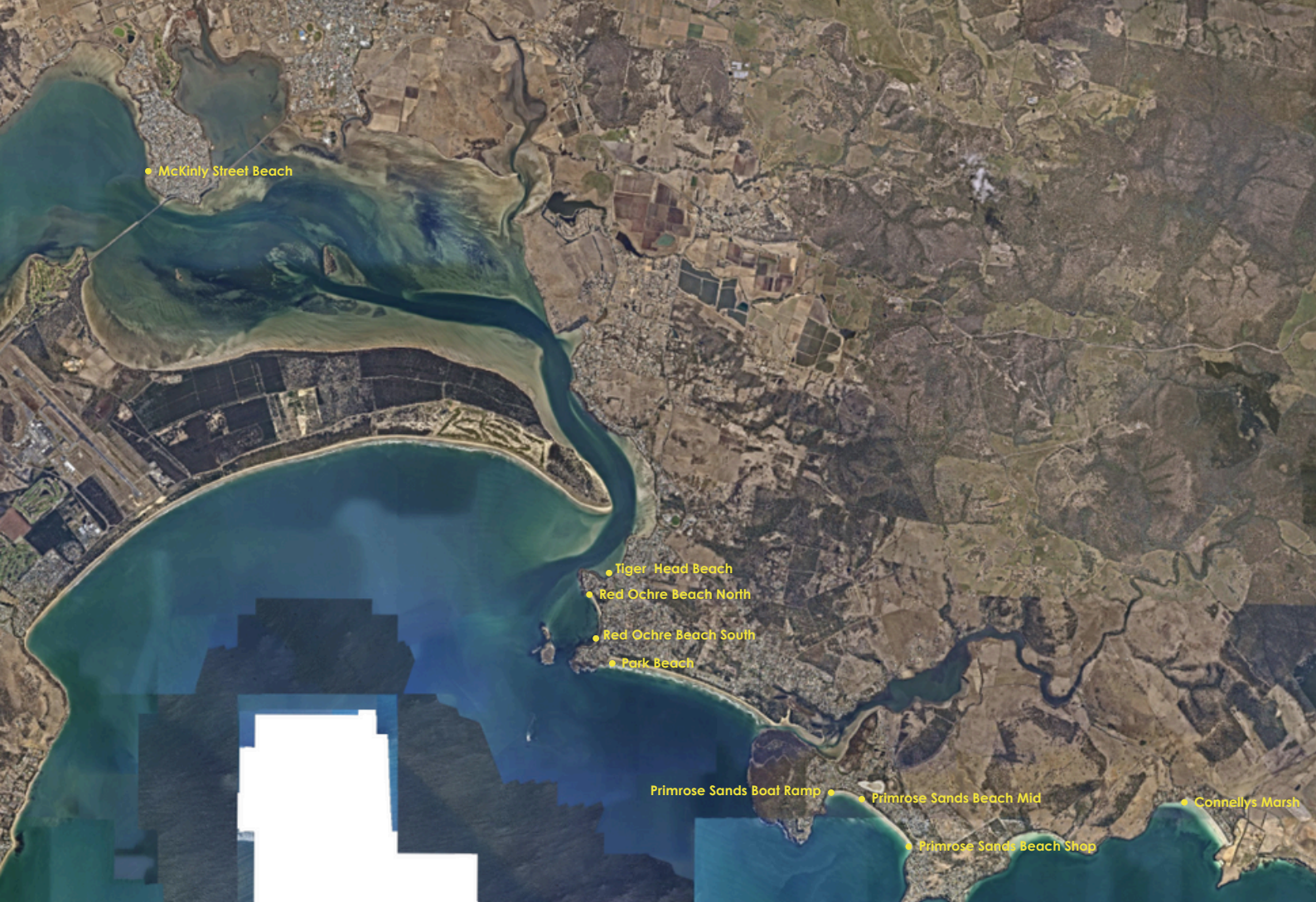


Figure 1 Overview of sampling locations in Sorell Council area. More detailed maps provided in Appendix 1

"Sorell Council pays their respects to the traditional and original owners of this land the Mumirimina people, to pay respect to those that have passed before us and to acknowledge today's Tasmanian Aboriginal community who are custodians of this land".

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# A Natural Recreation Water Bodies

## A -1 NAME AND LOCATION OF NATURAL WATER BODY AND PURPOSE.

Recreational water sampling undertaken by Sorell Council focuses on the broader Southern Beaches area between Connelly's Beach and Midway Point shown in Figure 1. Appendix 1 provides greater detail of all seven sampling locations. The Environmental health Team sample beaches that are considered primary contact beaches with additional secondary contact such as fishing, boating and diving occurring at all sites. Primrose Beach is habitat for the Red Spotted Hand fish currently listed as critically endangered adding greater emphasis on monitoring the recreational water body for human induced pollutants. An additional two sites have been added at Primrose Sands Beach due to the higher than usual bacterial loads recorded over the summer. Initial Investigations have been undertaken by Sorell Council EHO's however further investigation in the coming months will be required to attempt to identify sources of contamination. Sorell Council were approached by Derwent Estuary Program and a company ZIP Diagnostics to be a part of a trial for a new bacteriological analysis tool targeting specific human faecal bacteria. Further discussion is presented in a specific investigation report. Red Ochre Beach North and South along with Tiger Head Beach are points where the ocean water is channeled and concentrated into Barilla Bay and Orielton Lagoon, both world renowned RAMSAR wetlands and home to oyster farming activities attached to a worldwide export industry. This highlights the importance of monitoring the recreational water bodies along this coastline due to the multi-faceted layers of public health safety and the unique world class environmental values.

Table 1 Sorell Council's Location and recreational purpose for water body use. All sites are primary contact sites.

Name and location of water body	Recreational Purpose for water body use
Connellys Marsh Knights Road	Swimming, Boating, Fishing, Snorkelling
Primrose Sands Beach: Petrel St. Boat Ramp	Swimming, Boating, Fishing, Snorkelling
Primrose Sands Beach: Middle section (NEW)	Swimming, fishing, diving
Primrose Sands Beach: Southern end (Shop) (NEW)	Swimming, fishing, diving
Park Beach: Park Beach Road Dodges Ferry	Swimming, Surfing, Fishing
Red Ochre South: Parnella Road Dodges Ferry	Swimming, Boating, Fishing
Red Ochre North: Tiger Head Rd Dodges Ferry	Swimming; Boating, Fishing, Environmental Values
Tigerhead Beach: Seventh Ave Dodges Ferry	Swimming, Boating, Fishing
Tigerhead Beach: Seventh Ave Dodges Ferry	Swimming, Boating, Fishing
Tigerhead Beach: Seventh Ave Dodges Ferry	Secondary contact point (stormwater collection point)



## A -2

### DATE AND TYPE OF SAMPLING UNDERTAKEN AND RESULTS

Beaches and pools microbiological sampling were conducted in accordance with AS/NZS 5667, Water Quality -Sampling. Samples are collected in sterile containers provided by the Public Health Laboratory. Grab samples were used to collect water from a depth of approximately 300mm below the surface in water 600-1000mm deep. Aseptic techniques were used to avoid sample contamination.

The Compliance Officer collected water samples. Greg Robertson conducted sanitary surveys at the start of the summer sampling period and noted any changes throughout the season shown in table 5. Sanitary surveys were conducted by Environmental Health Officers randomly throughout the summer season in and around Primrose Beach Boat Ramp.

Weekly samples were collected, in accordance with the Public Health Act 1997 and Tasmanian Water Quality Guidelines during the three-month summer period 2024-2025 as detailed. This year Sorell Council continued to sample Primrose beach sites to April 14 to ensure Swimming was safe during this period. No sampling was undertaken over the Christmas-New Year period. Samples were stored and transported under refrigeration (iced esky) to the Laboratory, arriving within three hours of collection.

## A -3

### BEACH SAMPLING -TESTS AND ANALYSES PERFORMED

#### A -3.i MICROBIOLOGICAL TESTING

Samples were tested for Enterococci (Faecal streptococci); results obtained were presumptive unless a presumptive result indicated an exceedance of the 140 organisms/100mL. Risk classifications are based on Table 5.10 of the NH&MRC Guidelines for Recreational Water and Tasmanian Recreational Water Quality Guidelines 2007.

#### A -3.ii SANITARY SURVEY

Sanitary surveys show the influences that each Beach has in relation to tidal influence, housing density, stormwater infrastructure, geomorphology and land use (i.e. agriculture, grazing, cropping, residential, land clearing). Table 2 refers to the sanitary surveys performed at the start of each sampling season (December). The Southern Beaches sanitary surveys are performed annually to determine if any changes/influences/causative effects can be identified that may affect water quality of the recreational beach.

Variables to consider during the sampling season are wind, tides, temperature, population, stormwater, concentration of onsite waste management systems, intensive land clearing and agriculture, Urban sprawl with medium density housing close to waterways increase hard surfaces and fragmentation of native vegetation. These are all variables that may influence the water quality of the Southern Beaches.



Table 2 Sanitary survey of all beaches

Location	Sanitary Survey Risk	Risk
Connellys Marsh Beach	Minimum of 10 Boatsheds, yacht moorings, onsite wastewater management systems (OSWMS) on nearby properties, river at southern end of beach running through heavily grazed farms with livestock grazing within the riparian zone and river proper.	**Moderate-high (trending towards low risk)
Primrose Sands Beach	Potential failing OSWMS above western end of the beach, active landslip along the foredune of Carlton Bluff Road, vehicle movement on beach (prohibited activity), concentrated ground water seepage and old stormwater infrastructure.	Moderate -poor
Primrose Sands Beach Shop	OSWMS above dune area Onsite Waste management systems, carpark, dogs, stormwater outfall.	Good (first season)
Primrose Beach mid beach	Remnant vegetation on private land on the foredune, wetland lagoon nearby, OSWMS from houses on the foredune.	Good (first season)
Park Beach Carlton	High density OSWMS large dune system for protection against seepage, toilet block nearest to sample site. High energy beach	Low
Red Ochre South Beach	Stormwater outfalls: birdlife habitat protected area Spectacle Head, boatsheds, gravelly beach, higher density housing with OSWMS, greater threat of nutrient enrichment from OSWMS	High
Red Ochre North Beach	Bird life, OSWMS, medium density housing Spectacle Head a known rookery for shorebirds. Blue lagoon in the back of the dune and playground.	Moderate
Tiger Head Beach (Seventh Ave)	Large Stormwater outfalls, unsewered area, high density residential with Onsite waste management systems.	High
McKinly St Midway Point	Large stormwater outfalls onto beach, Orielton Lagoon RAMSAR wetland protected area. Highest density urbanisation with increased gross litter being washed into waterway. Hard surface land clearing. History of sewerage failure from pump station situated above the beach.	High
Blue Lagoon	Secondary contact point monitoring for stormwater quality	High

\*\*Moderate also known as fair



## A -4

### RESULTS AND DISCUSSION OF SAMPLING ANALYSIS

Rainfall data collected from the Sorell abattoirs rain gauge located at Ingham's Processing factory. The following table (table 3) shows the relationship between water quality results and rainfall during the 2024-2025 season using the Pearson's *r* correlation. The 2023-2024 summer sampling period showed four beaches had some relationship between rainfall and enterococci results, while the 2024-2025 season did not show any correlations. This suggests that there are still catchment issues to be addressed. The Bureau Of Meteorology summer season summary described the overall South east Tasmanian summer as wetter than the long-term average, however, it is important to note that Majority of rainfall fell in the first eight days of December. This equated to >46% of the summers rain. The January and February rainfall was well below average.

Appendix 8 provides The Tasmanian climate summary for summer 2024-25.

Table 3 Pearson's *r* correlation for 2024-2025 summer sampling season

Name and location of water body	Pearson <i>r</i> Correlation result.
Connellys Marsh Knights Road	0.0358 negligible
Primrose Sands Beach: Petrel Street	-0.0113 negligible
Park Beach: Park Beach Road Dodges Ferry	0.0055 negligible
Red Ochre South: Parnella Road Dodges Ferry	-0.1141 negligible
Red Ochre North: Tiger head Rd Dodges Ferry	-0.1908 negligible
Tigerhead Beach: Seventh Ave Dodges Ferry	0.1578 negligible
McKinly St Beach Access Midway Point	-0.017 negligible

Pearson's *r* Correlation

This year Sorell Council have included analysis using the number of exceedances beyond the prescribed trigger level of 140mpn 100ml-1 set by the Tasmanian Recreational Water Guidelines 2007. This aids in determining whether other activities within the catchment may be contributing to water quality.

Table 4 list of number of swimming sites from the last five RWQ seasons triggering a retest under the Tasmanian Recreational Water Quality Guidelines by exceeding enterococci >140 MPN 100mL<sup>-1</sup> (DOH, 2007)

RWQ Season	Number of exceedances
2019-20	1
2020-21	1
2021-22	4
2022-23	4
2023-24	5
2024-25	14

The number of exceedances compared to last season was three times higher. One site in particular Primrose Sands Boat Ramp exceeded the trigger level nine times this season compared with two times the previous 2023-2024 summer period. The high bacteriological readings of enterococci occurred throughout the entire summer period with exceedances recorded at all sites except for Red Ochre North. This is consistent with the results from the six councils along the Derwent Estuary where all sites from New Norfolk to Clarence recorded above normal exceedances. Table 4 provides the list of exceedances for the last five RWQ seasons. The exceedances show an increasing trend in exceedances over the seasons. However, there has been no statistical analysis, and this trend is speculation only. However, it provides more evidence to Council on the need to inform and educate the Southern beaches community on the importance of regular maintenance of onsite wastewater systems and upgrade to secondary treatment is essential to address pollution at the source prior to entering the waterways and greater environment.

Table 5 uses a rolling five-year dataset for determining the 95<sup>th</sup> Hazen percentile. As determined by NHMRC and Tasmanian Recreational Water Quality Guidelines. Statistical analysis performed on the water quality of the sites showed three of the seven beaches slightly declined in water quality while three sites remained stable. One site Primrose Beach (Boat Ramp) rapidly declined to change from good water quality to fair for the 2025-26 season. The additional two sites on Primrose beach could not be statistically analysed, however, only one exceedance occurred at both additional Primrose Beach sites this summer. Therefore, both sites are ranked 'good' for 2025-26 to reflect results of the sanitary survey. Due to the 95<sup>th</sup> Hazen Percentile being determined over a five-year rolling data set, the new sites will be included for Primrose Sands and as such Council has installed an additional recreational water quality alert sign at the southern end of Primrose Beach (figure 2).

Figure 2 New installed RWQ sign at the Southern end Primrose Beach (Shop).





## ZIP Diagnostics Trial

This season The Derwent Estuary Organisation in conjunction with Sorell Council trialed a new product for sampling and analysing human specific bacteria. *Bacteroides dorei* has high specificity for human faecal indicator bacteria (FIB) differentiating it from the presence of FIB from other animals (e.g., livestock and dogs etc.) (DEP 2025). The trial saw samples taken from groundwater seepages and the Primrose Beach Boat Ramp RWQ site. The results returned positives at the groundwater seepages while all recreational water samples returned negative results. Overall, the trial allowed Sorell Council to determine further investigations are required regarding land-based seepages from groundwater entering the coastal environment. Future FIB sampling may be used to help Sorell Council rapidly identify sources of human faecal contamination that may be affecting recreational water quality. A separate report has been submitted relating to the Primrose Sands beach decline in water quality. Please refer to the Primrose Sands Water Quality Investigation Report by Greg Robertson.

Table 5. 95th Hazen percentile figures from previous 5yrs 2020 - 2025

Site	Connellys Beach	Primrose Sands	Park Beach	Red Ochre South	Red Ochre North	Tiger Head Beach	McKinly Beach
Percentile	95	95	95	95	95	95	95
Minimum data points needed	10	10	10	10	10	10	10
Number data points you have	90	92	90	98	97	98	101
Data minimum	10	10	10	10	10	10	10
Data maximum	187	15531	146	2924	187	529	2247
Hazen result	80	367.75	33.5	89	110	77.5	285.75
*TRWQG category	A	C	A	A	A	A	C
**NHMRC category	B	C	A	B	B	B	C
*Tasmanian Recreational Water Quality Guidelines 2007							
**NHMRC 2006 to be used with classification matrix for faecal pollution of recreational water environments.							

Table 6 represents the variation from 2023-2024 season to 2024-2025 season. Three sites were stable with minimal changes in water quality with the exception of Primrose beach (Boat Ramp) declining significantly to change the RWQ status. Two beaches showed decline with a slight improvement shown at Red Ochre north beach. Future reports will include the two new Sample sites Mid and shop end of Primrose Beach.

Table 6 Recreational Beaches monitored by Sorell Council. Red denotes Poor quality (>500MPN/100mL/1), amber Denotes moderate quality (200-500MPN 100mL-1) and green denotes good water quality (<200MPN 100mL-1).

	Beaches/River	Status 2024-2025 based upon 5-year 95th Hazen percentile for Enterococci	Trend based upon 5-year 95th Hazen percentile for Enterococci
1	Connellys Marsh	Good B	Declining water quality from 41 (2019-2024) to 80 (2020-2025)
2	Primrose Sands (Boat Ramp)	Moderate (C)	Significantly declining water quality from 63 (2019-2024) to 367 (2020-2025)
3	Park Beach	Good A	Slight decline in water quality from 20 (2019-2024) to 33 (2020-2025)
4	Red Ochre South	Good B	Stable water quality from 72.7 (2019-2024) to 80 (2020-2025)
5	Red Ochre North	Good B	Water quality improvement from 140.3 (2019-2024) to 110 (2020-2025)
6	Tigerhead Beach	Good B	Stable water quality from 78.95 (2019-2024) to 77.5 (2020-2025)
7	McKinly Beach	Moderate C (fair)	Stable water quality from 294.35 (2019-2024) to 285.75 (2020-2025)



Dodges Ferry - Red Ochre Beach



## A -5

### SWIMMING BEACH CLASSIFICATION FOR START OF 2025-2026 SWIMMING SEASON (Dec-April).

The water quality classification for Recreational Beaches is based on Table 5.13 – Classification matrix for faecal pollution in recreational water environments taken from the NHMRC – Guidelines for Managing Risks in Recreational Water. The Sorell Environmental Health Officer uses the Tasmanian Recreational Water Guidelines (green column) classification for the 2025-2026 summer season.

Sorell Council continue to provide immediate action when failed recreational water quality

samples occur during the summer season. This is done by Sorell Council's Facebook page and by flipping signs at the affected beach alerting public to not swim during times of poor water quality. Sorell Council continues to recommend not swimming for two to three days after rainfall events to ensure the safety of bathers at recreational water monitoring sites.

Table 7 Sorell Council Beach classifications based on 2024-2025 summer sampling season. New sites omitted until one samples have been collected for a full season.

Location	Sanitary survey risk	Water quality category based on 95% hazen percentile - 5year indicator organisms results	Combined Category NHRMRC	Tasmanian Rec Water Guidelines classification
Connellys Beach	Moderate-high	B	Fair	Good
Primrose Beach	Moderate	C	Fair	Moderate (Fair)
Park Beach	Low	A	Very Good	Good
Red Ochre Beach (South)	High	B	Fair	Good
Red Ochre Beach (North) aka Blue Lagoon	Moderate-High	B	Good	Good
Tigerhead Beach (Seventh Ave)	High	B	Fair	Good
McKinly St, Midway Point	High	C	Poor	Moderate (Fair)

Changes to classification status this season. Primrose Beach Boat Ramp.

## A -6

### NATURAL WATER BODY DISCUSSION ON POTENTIAL SOURCES OF POLLUTION

The catchment areas of each of the Southern beaches sampling sites (excluding McKinly St, which is serviced by reticulated sewerage) contain significant numbers of septic tanks and other on-site wastewater management systems. Some of which suffer varying levels of malfunction during periods of wet weather. Stormwater systems or creeks may convey pollutants discharged from on-site wastewater management systems to beach areas. Stormwater outfalls discharge in the vicinity of each of the recreational sampling sites, except for Park Beach. Figure 3 shows multiple factors that influence the quality of our recreational Water quality.

Dodges Ferry Lagoons, TasWater commissioned a Dodges Ferry Sewerage Technical Due Diligence Report in 2018. The report investigated the current status of the lagoons. This included the potential impacts from the 25yo sewage lagoon system to environment and public health. One finding concluded that a 'relatively high' risk of seepage within the underlying aquifers can potentially cause groundwater contamination and therefore increase the risk of pathogen contamination in nearby recreational waters. Increased nitrification has been recorded in nearby groundwater testing. TasWater is currently developing alternative options to upgrade the existing system to increase the treatment process to tertiary level and mitigate any contamination risk in the future. Sorell Council's NRM and Environmental Health continue to monitor the condition and performance of the sewage lagoons.



Figure 3 Pollution Sources affecting water bodies source;



## RECENT ADVANCEMENTS AND SUCCESSFUL PROJECTS WORKING TO MAINTAIN AND IMPROVE RECREATIONAL WATER QUALITY SITES.

Onsite Waste Management systems continue to play a significant role in recreational water quality due to the abundance and increased urbanisation of the Southern Beaches. The growing popularity of the Southern Beaches results in increased development particularly residential dwellings. This has seen haphazard land clearing, replacement of pervious natural landforms for impervious hard surfaces, increased population, and higher visitation within the area.

The introduction of the Southern beach On-site wastewater and Stormwater Management Specific area plan has provided Council with a means to assess proposed onsite wastewater management systems. Secondary water treatment via aerated waste treatment systems and raised sand filter beds aids in improving the wastewater quality prior to entering the landscape. Both treatments provide nutrient reduction through evapotranspiration and uptake of excess nutrients through planting and filtered sand beds.

Sorell Council has engaged specialist wastewater experts to provide a contemporary wholistic plan for the Southern Beaches onsite wastewater management. Once the report is finalised, Sorell Council along with TasWater will benefit from having realistic goals and strategies to improve the health of the environment. It is hoped that water Sensitive Urban Design continues to be a high priority.

The Coastal and Estuarine Risk Mitigation Program (CERMP) – Protecting our Coastline. The Natural Resource Management Officer Dibas Pantas along with the stormwater engineer have been collaborating to implement the Hazard Risk reduction in the southern beach's region project. The project focuses on improved outfall water quality while aiding in slowing erosion of some of the Sorell Southern beaches remaining foreshore dune system.

One of the major projects completed last year related to the Seventh Avenue stormwater upgrade. During construction contamination from historical cross connections from more than one dwelling was found and capped. The new pipework has increased the capacity for collecting stormwater within the catchment and the installation of a gross pollutant trap (GPT). With greater capacity to move stormwater, it reduces the flooding risk and therefore reduces failing OSWMS'. The GPT enables the capture of rubbish and other contaminants prior to entering the waterway. The results from the summer season showed Tigerhead had only one exceedance throughout the RWQ season. This occurred at the start of December. The high intensity rainfall event occurred after an extended period of dry weather. One may surmise that the first sample taken was highly influenced by a long period of dry weather with stagnant water pooling in the newly laid pipes for an extended period. This water was flushed out of the system. Once the first December rains abated, the results were compliant for the rest of the season.

Further information on this project can be accessed via our website <https://www.sorell.tas.gov.au/coastal-and-estuarine-risk-mitigation-program-cermp-protecting-our-coastline/#accordion-item-0-1>. Stage one has been completed with stage 2 currently actioned.

TasWater. In addition, recent upgrades in storage capacity of the TasWater owned Midway Point Sewerage network included Mc Kinley St SPS and Reynolds rd. SPS new storage. The Mc Kinley Street beach remained stable at Fair. TasWater have improved their sewerage infrastructure maintenance program, cleaning of pipe work to reduce blockages and overflows. It is hoped that the improved network and maintenance will reduce the amount of raw sewage overflows during rainfall events and the site will benefit with improved water quality. The Tasman Highway sewage pump station upgrade is still in progress at the time of the report being written.

Rivers to Ramsar improving catchment and wetland health at Pitt Water-Orielton Lagoon. The Natural Resource Management Officer Dibas Pantar was successful in securing \$1.9million funding from the Australian Government's Natural Heritage Trust under the Urban Rivers and Catchments Program. NRM South's Rivers to Ramsar project will be doing on-ground actions to improve the ecological condition of the waterways that feed into Orielton Lagoon. Weed control, stock exclusion, revegetation and waste removal are ways that will improve the water quality by managing these and other threats. This grant is a significant advancement on improving our waterways to restore natural habitat and natural filtration systems throughout the rivers that flow into our recreational Beaches. For further information see <https://nrmsouth.org.au/project/rivers-to-ramsar/>



**Pittwater-Orielton Lagoon**

## A -8

### NATURAL WATER BODY

### CONCLUSIONS/RECOMMENDATIONS

Five sites are categorized as 'good' according to the Tasmanian Recreational Water Guidelines with the Boat Ramp end of Primrose and McKinly Beaches classified as 'moderate' (Fair). The 2024-2025 recreational water quality remained stable overall with little changes shown in the sanitary surveys conducted. However, the micro bacteriological sampling results showed greater contamination than previous years. The continued subdivisions and over-development on small blocks increasing urbanisation of the Southern Beaches means less natural vegetation and landforms, reducing natural beneficial stormwater filtration. The McKinley Street pump station upgrade has seen the water quality stabilise in the last season which is a positive sign for the area. It is hoped this trend will see improving water quality.

Council's 'Stormwater in new development policy' requires all future developments to minimise the risk of harm or degradation of natural values due to pollutants. It is strongly recommended to increase the percentage of pervious surfaces as part of Water Sensitive Urban Design in development applications to ensure the necessary balance between human habitation and natural landscapes.

Major stormwater pipes should never be channeled directly to oceans unless a series of treatment ponds, and filtering systems have been implemented upstream prior to discharge. Onsite wastewater must be treated while remaining within property boundaries. This would achieve an uncontaminated clean environment for a safer and healthier future for the Southern Beaches residents, visitors and the unique fauna and flora.

One recommendation is to provide public tracks and trails alongside the main creeks and rivers to create a network of human connectivity while providing riparian zones and wildlife corridors. Waterways are an excellent way of improving the environmental health of the local area and public health of the communities who live within our area.

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11. Natural Resource Management South; <https://nrmsouth.org.au/project/rivers-to-ramsar/>
12. Sorell Council Website, <https://www.sorell.tas.gov.au/coastal-and-estuarine-risk-mitigation-program-cernp-protecting-our-coastline/#accordion-item-0-1>

## Guidelines

The Tasmanian Recreational Water Quality Guidelines 2007

National Health and Medical Research Council (NHMRC) "Guidelines for Managing Risks in Recreational Waters 2006

Australian Guidelines for Urban Stormwater Management (historical guidelines) <https://www.waterquality.gov.au/guidelines/urban-stormwater>.

Microbial Quality of Recreational Water Guidance Notes- Western Australia Department of Health and the University of Western Australia.

## Legislation

*Public Health Act 1997*



## APPENDICES

### APPENDIX 1 - COLOUR ATLAS RECREATIONAL WATER SAMPLING SITES

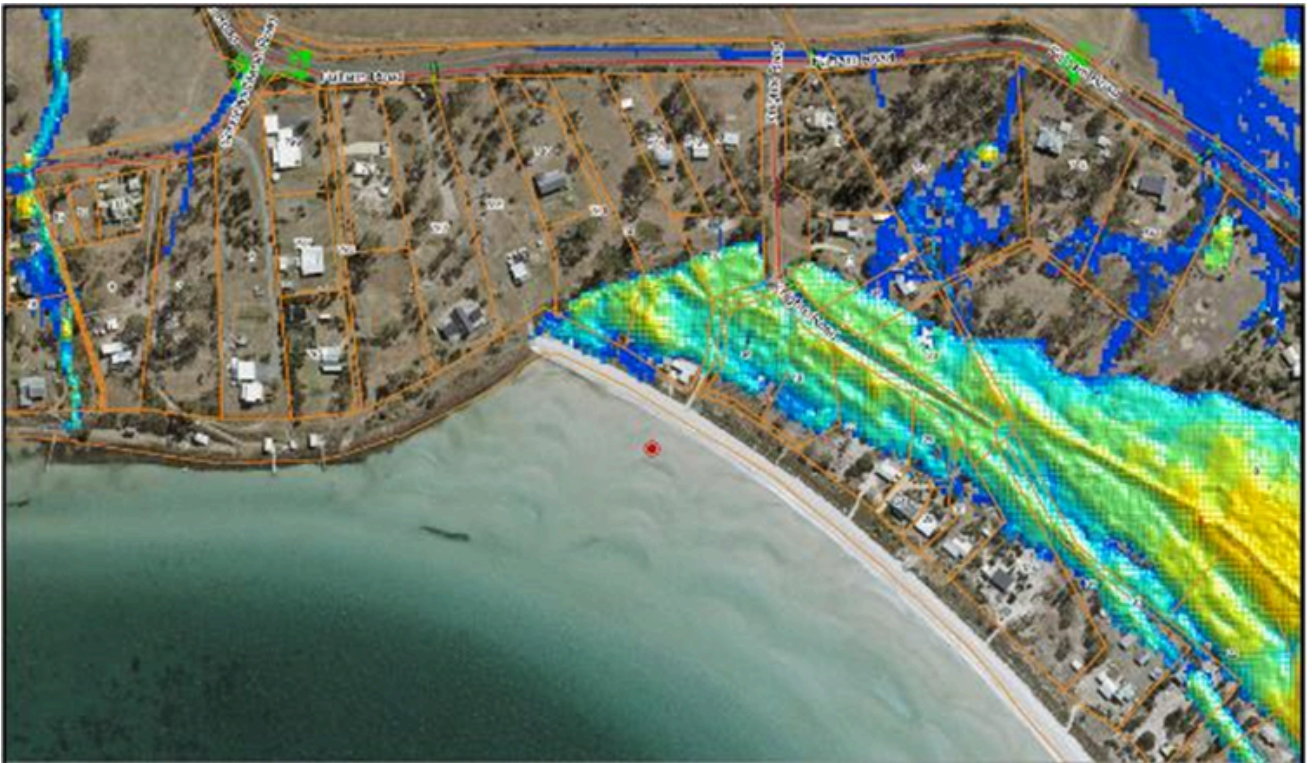


Figure 3 Connellys Marsh showing flood extent and stormwater infrastructure

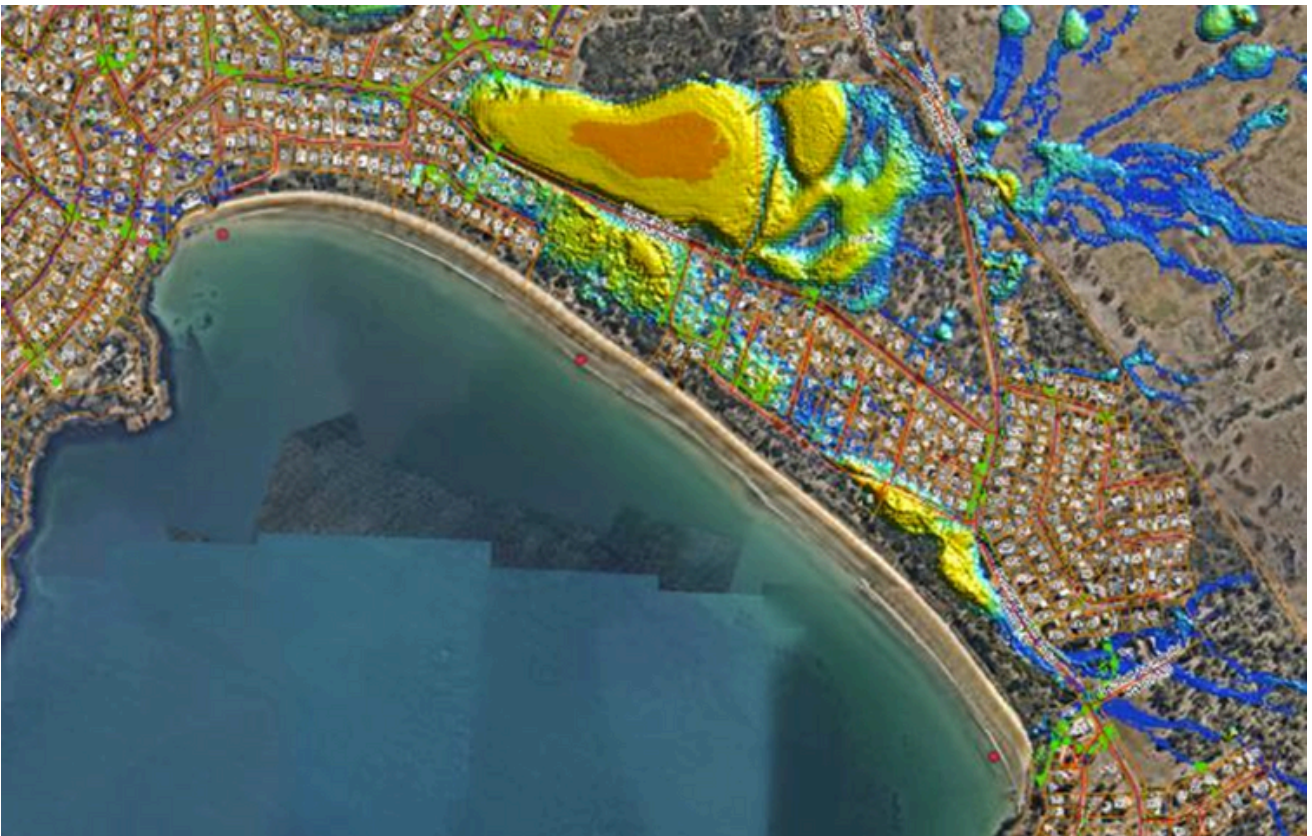


Figure 4 Primrose Sands Beach. Existing and two new sample points and showing flood extent and stormwater infrastructure





Figure 5 Park Beach Carlton showing flood extent and stormwater infrastructure

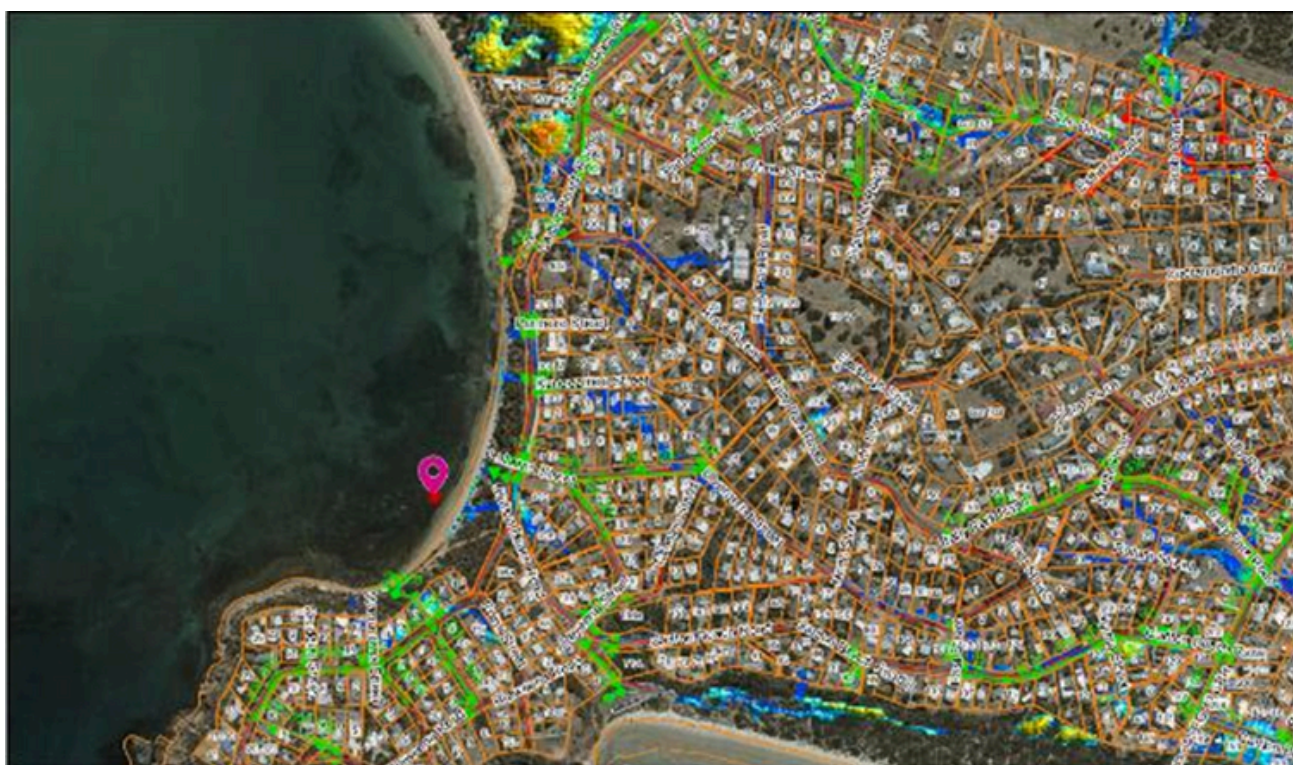


Figure 6 Red Ochre Beach South showing flood extent and stormwater infrastructure



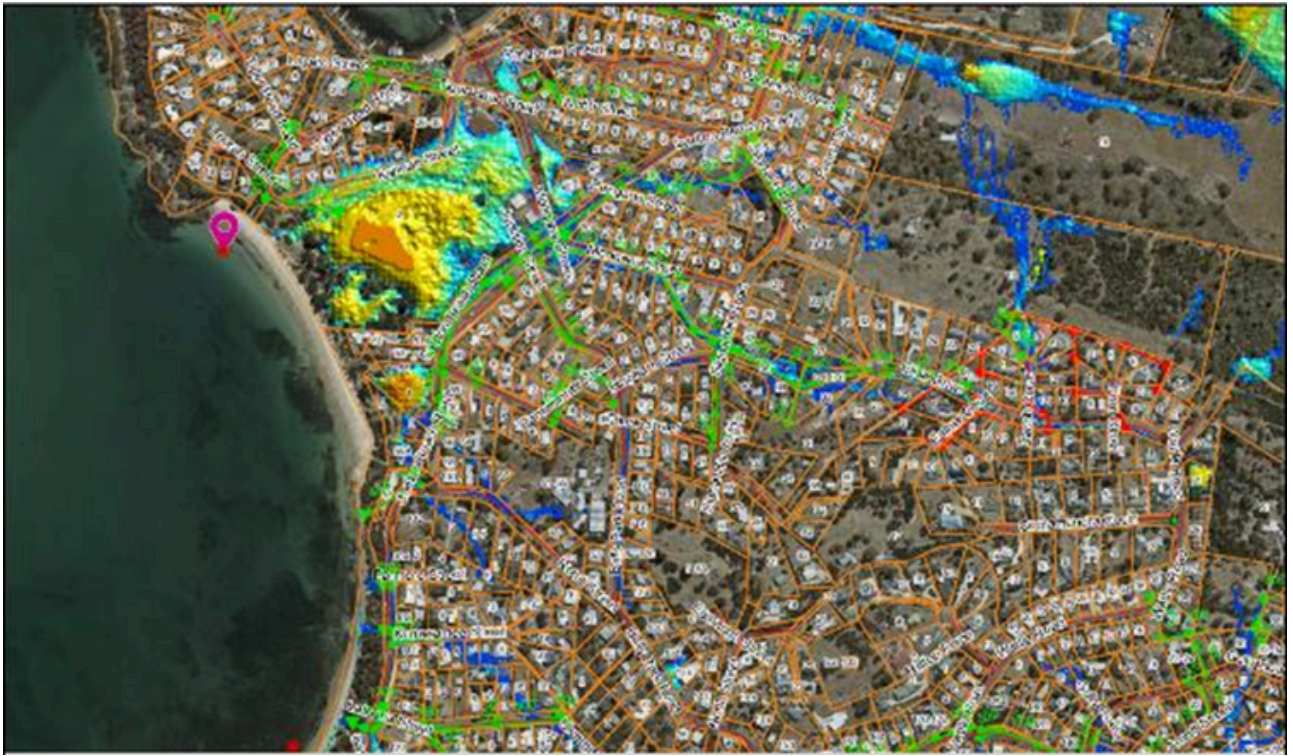


Figure 7 Red Ochre Beach North showing flood extent and stormwater infrastructure



Figure 8 Tiger Head Beach @ 7th Ave showing flood extent and stormwater infrastructure





Figure 9 McKinly St Beach sewer in red; stormwater in green, flood risk and waterway shown

## APPENDIX 2 - SUMMARY OF RECREATIONAL WATER BODY SAMPLING RESULTS 2024-2025

Table 8 data results from 2024-2025 summer season. Red denotes a failed water result, amber some contamination and pink minor reading.

2024-2025 sample Date	Connellys Beach	Primrose Beach Boat Ramp Petrel St	Park Beach Carlton	Red Ochre - South Dodges Ferry	Red Ochre - North-Dodges Ferry	Tigerhead - Seventh Avenue Dodges Ferry	McKinley St Midway Point
2 Dec 2024	75	52	10	908	10	529	10
4 Dec 2024				63		10	
9 Dec 2024	10	10	10	20	10	10	10
16 Dec 2024	10	538	146	30	10	10	10
18 Dec 2024		15531	20	resample selected sites only			
19 Dec 2024		110					
19 Dec 2024		75					
19 Dec 2024							
23 Dec 2024	10	30	10	10	10	10	10
6 Jan 2025	10	175	10	10	41	10	84
13 Jan 2025	20	1789	10	63	52	41	2247
15 Jan 2025		41					10
20 Jan 2025	10	2400	10	10	10	10	20
28 Jan 2025	31	313	10	10	10	10	20
3 Feb 2025	10	98	10	10	10	10	10
11 Feb 2025	10	52	10	20	10	20	10
17 Feb 2025	20	31	10	10	10	10	85
24 Feb 2025	10	201	31	20	10	10	20
3 Mar 2025	10	1330	10	10	10	10	10
11 Mar 2025	10	10	10	2924	10	20	10
17 Mar 2025	20	10	10	10	20	75	183
24 Mar 2025	10	10	10	10	10	10	10
1 Apr 2025	41	20	10	10	135	10	52
7 Apr 2025		246	Primrose sampled until Easter.				
14 Apr 2025		10					

Table 9 Additional Primrose sample points middle beach and Shop end of beach

2024-2025 sample date	Primrose Beach Shop	Primrose Beach Middle	Bacteroides results (ZIP) Primrose Beach Boat Ramp
19 Dec 2024	10		
13 Jan 2025	10		
15 Jan 2025	10	85	
20 Jan 2025	10	295	
28 Jan 2025	1553	10	
3 Feb 2025	10		Negative
11 Feb 2025	10	10	Negative
17 Feb 2025	10	10	Negative
24 Feb 2025	10	131	Negative
3 Mar 2025	10	10	Negative
11 Mar 2025	10	10	
17 Mar 2025	10	10	Negative
24 Mar 2025		10	
1 Apr 2025	10	10	
7 Apr 2025	31	63	
14 Apr 2025	10	10	



## APPENDIX 3 - RAINFALL DATA

Table 10 Rainfall data taken from Sorell Abattoir's rain gauge manually read by a volunteer Weather Observer. BOM has not quality controlled this rain gauge. 72 hour cumulative Rainfall measurements preceding the sample day.

2024-2025	Total Rainfall(mm) for preceding 3 days Taken from Sorell Abbatoirs.
2 Dec 2024	13
4 Dec 2024	0
9 Dec 2024	40.6
16 Dec 2024	8.1
18 Dec 2024	7.5
19 Dec 2024	0
23 Dec 2024	25.2
6 Jan 2025	0
13 Jan 2025	5.9
15 Jan 2025	0.2
20 Jan 2025	0
28 Jan 2025	1.4
3 Feb 2025	0.4
11 Feb 2025	0.8
17 Feb 2025	8.3
24 Feb 2025	4
3 Mar 2025	0
11 Mar 2025	0
17 Mar 2025	16
24 Mar 2025	0
1 Apr 2025	0.8
7 Apr 2025	1
14 Apr 2025	9.2

Summary of Tasman Island and Stroud point Dunalley rainfall for summer. Illustrating the intense rainfall events at the start of the summer RWQ season with minimal rainfall for the rest of the season and is comparative with the Inghams rain gauge for the same time.

### Dunalley (Stroud Point) 94254

Summer Longterm Average 150.0mm Dec-Feb (18 days >1.0mm)

Summer 2024-25 225.6mm 15 days >1.0mm

It is important to note that 5 of these 15 days were in the first 8 days of December which produced >46% of the summers rain.

December 2024 Average 52.4mm

1<sup>st</sup> to 8<sup>th</sup> 105.6mm (8 days) 5 days >1mm

9<sup>th</sup> to 31<sup>st</sup> 22.4mm 3 days >1mm

January Average 73.6 mm

2025 18.8mm VERY DRY only 2 days >1mm. The 13<sup>th</sup> Jan rainfall event of 15.4mm was 82% of the months total rainfall

February Average 24.0 mm

2025 19.4mm 5 days >1mm

March Average 36.9 mm

2025 16.4mm 5 days >1mm

### Tasman island 94155

Summer Longterm Average 183.7mm Dec-Feb (24 days >1.0mm)

Summer 2024-25 238.0mm 22 days >1.0mm

December was wet in Tasman Island

December Longterm Average 68.0mm with 9.6 days >1.0mm.

December 2024 164.4mm with 12 days >1.0mm.

January Average 66.6 mm (7.3 days >1mm.)

2025 37.6mm VERY DRY 5 days >1mm. The 13<sup>th</sup> Jan rainfall event of 20.6mm was 55% of the month's total rainfall

February Average 49.1 mm

2025 36.0mm 7 days >1mm

March Average 67.9 mm

2025 43.2mm 8 days >1mm

## APPENDIX 4 - GUIDELINE VALUES FOR MICROBIAL QUALITY OF RECREATIONAL WATERS

For marine waters, only faecal streptococci (Enterococci) showed a dose-response relationship for both gastrointestinal illness and Acute Febrile Respiratory Infection (AFRI). A recent reanalysis of this data using a range of contemporary statistical tools has confirmed that the relationships originally reported are robust to alternative statistical approaches.

The cut-off or bounding values (40, 200, and 500) are expressed in terms of the 95<sup>th</sup> percentile of numbers of faecal streptococci per 100 mL, and represent readily understood levels of risk, based on the exposure conditions of the key studies.

For the purpose of water-quality monitoring, the terms 'faecal streptococci', 'intestinal Enterococci' and 'Enterococci' are considered to be synonymous. Exposure to recreational waters with these measured indicators refers to body contact that is likely to involve head immersion, such as swimming, surfing, white-water canoeing, scuba diving and dinghy-boat sailing.

95th Percentile value of intestinal Enterococci / 100ml (rounded Values)	Basis of derivation	Estimated risk per exposure
$\leq 40$ A	This range is below the NOAEL in most epidemiological studies.	<p>&lt;1% GI illness risk</p> <p>&lt;0.3% AFRI risk</p> <p>The upper 95th percentile value of 40/100ml relates to an average probability of less than one case of gastroenteritis in every 100 exposures. The AFRI burden would be negligible.</p>
41-200 B	The 200/100 ml value is above the threshold of illness transmission reported in most epidemiological studies that have attempted to define a NOAEL or LOAEL for GI illness	<p>1-5% GI illness risk</p> <p>0.3-1.9% AFRI risk</p> <p>The upper 95th percentile value of 200/100 ml relates to an average probability of one case of gastroenteritis in 20 exposures. The AFRI illness rate at this upper value would be less than 19 per 1000 exposures, or less than approximately 1 in 50 exposures.</p>
201-500 C	This range represents a substantial elevation in the probability of all adverse health outcomes for which dose-response data are available.	<p>5-10% GI illness risk</p> <p>1.9-3.9% AFRI risk</p> <p>This range of 95th percentiles represents a probability of 1 in 10 to 1 in 20 of gastroenteritis for a single exposure. Exposures in this category also suggest a risk of AFRI in the range of 19-39 per 1000 exposures, or a range of approximately 1 in 50 to 1 in 25 exposures.</p>
>500 D	Above this level, there may be a significant risk of high levels of minor illness transmissions.	<p>&gt;10% GI illness risk</p> <p>&gt;3.9% AFRI risk</p> <p>There is a greater than 10% chance of gastroenteritis per single exposure. The AFRI illness rate at the 95th percentile point of &gt;500/100ml would be greater than 39 per 1000 exposures, or greater than approximately 1 in 25 exposures.</p>



Notes:

1. Abbreviations used: A-D are the corresponding microbial water quality assessment categories used as part of the classification procedure; AFRI = acute febrile respiratory illness; GI = gastrointestinal; LOAEL = lowest-observed-adverse-effect level; NOAEL = no-observed-adverse-effect level.
2. The "exposure" in the key studies was a minimum of 10 minutes of swimming involving three head immersions. It is envisaged that this is equivalent to many immersion activities of similar duration, but it may underestimate risk for longer periods of water contact or for activities involving higher risks of water ingestion (see also note 8)
3. The "estimated risk" refers to the excess risk of illness (relative to a group of non-bathers) among a group of bathers who have been exposed to faecally contaminate recreational water under conditions similar to those in the key studies.
4. The functional form used in the dose-response curve assumes no further illness outside the range of data (i.e., at concentrations above 158 intestinal enterococci/100ml). Thus, the estimates of illness rate reported above this value are likely to be underestimates of the actual disease incidence attributable to recreational water exposure.
5. The estimated risks were derived from sewage-impacted marine waters. Different sources of pollution and more or less aggressive environments may modify the risks.
6. This table may not relate to children, the elderly or the immunocompromised, who could have lower immunity and might require a greater degree of protection. There are presently no adequate data with which to quantify this, and no correction factors are therefore applied.
7. Epidemiological data on fresh waters or exposures other than swimming (e.g., high-exposure activities such as surfing, dinghy boat sailing or white-water canoeing) are currently inadequate to present a parallel analysis for defined risks. Thus, a single series of microbial values is proposed, for all recreational uses of water, because insufficient evidence exists at present to do otherwise. However, it is recommended that the length and frequency of exposure encountered by special interest groups (such as bodysurfers, board riders, windsurfers, sub-aqua divers, canoeists and dinghy sailors) be taken into account.
8. Where disinfection is used to reduce the density of index organisms in effluent and discharges, the presumed relationship between intestinal Enterococci (as an index of faecal contamination) and pathogen presence may be altered. This alteration is, at present, poorly understood. In water receiving such effluents and discharges, intestinal Enterococci counts may not provide an accurate estimate of the risk of suffering from gastrointestinal symptoms or AFRI.
9. Risk attributable to exposure to recreational water is calculated after the method given by Wyer et al. (1999), in which a log 10 standard deviation of 0.8103 for faecal streptococci was assumed. If the true standard deviation for a Beach is less than 0.8103, then reliance on this approach would tend to overestimate the health risk for people above the threshold level, and vice versa.

Note that the values presented in this table do not take account of health outcomes other than gastroenteritis and AFRI. Where other outcomes are of public health concern, then the risks should also be assessed and appropriate action taken.

10. Guideline values should be applied to water used recreationally and at the times of recreational use. This implies care in the design of monitoring programs to ensure that representative samples are obtained.

Page 70-71, Guidelines for Safe Recreational Water Environments – Vol 1 – Coastal and Fresh Waters – World Health Organisation, Geneva, 2003.

## APPENDIX 5 - CLASSIFICATION MATRIX FOR FAECAL POLLUTION OF RECREATIONAL WATER ENVIRONMENTS

**Table 5.13 Classification matrix for faecal pollution of recreational water environments<sup>a</sup>**

		Microbial water quality assessment category (95 <sup>th</sup> percentiles — Intestinal enterococci/100 mL)				Exceptional circumstances <sup>c</sup>
		A ≤ 40	B 41–200	C 201–500	D > 500	
Sanitary inspection category (Susceptibility to faecal influence)	Very low	Very good	Very good	Follow up <sup>b</sup>	Follow up <sup>b</sup>	ACTION
	Low	Very good	Good	Follow up <sup>b</sup>	Follow up <sup>b</sup>	
	Moderate	Good <sup>a</sup>	Good	Poor	Poor	
	High	Good <sup>a</sup>	Fair <sup>a</sup>	Poor	Very poor	
	Very high	Follow up <sup>a</sup>	Fair <sup>a</sup>	Poor	Very poor	
Exceptional circumstances <sup>c</sup>		ACTION				

- a Indicates possible discontinuous/sporadic contamination (often driven by results such as rainfall). This is most commonly associated with the presence of sewage – contaminated stormwater. These results should be investigated further, and initial follow-up should include verification of the sanitary inspection category and ensuring that samples recorded include 'event' periods. Confirm analytical results, review possible analytical errors.
- b Implies nonsewage sources of faecal indicators (eg livestock), which need to be verified.
- c Exceptional circumstances are known periods of higher risk such as during an outbreak involving a human or other pathogen that may be waterborne (eg avian botulism — where outbreaks of avian botulism occur, swimming or other aquatic recreational activities should not be permitted), or the rupture of a sewer in a recreational water catchment area etc. Under such circumstances the classification matrix may not fairly represent risk/safety.
- \* In certain circumstances there may be a risk of transmission of pathogens associated with more severe health effects through recreational water use. The human health risk depends greatly on specific (often local) circumstances. Public health authorities should be engaged in the identification and interpretation of such conditions.

Figure 10 NH&MRC Guidelines for Managing Risks in Recreational Water

## APPENDIX 6 - TASMANIAN RECREATIONAL WATER QUALITY GUIDELINES

The Tasmanian Recreational Water Quality Guidelines, (the "Tasmanian Guidelines") adopted, by reference, the National Health and Medical Research Council (NHMRC) "Guidelines for Managing Risks in Recreational Waters 2006", (the "new NHMRC Guidelines"); provide a range of guideline values in respect of Enterococci sample statistics, which should be considered in combination with sanitary survey results, in assessing the suitability of recreational water bodies for primary contact recreation.

Whilst monitoring for Enterococci or Thermotolerant Coliforms is considered to provide evidence of faecal contamination in a water body; it does not provide anything more than an indication of the likely presence of viral contamination. Enteric viruses such as Hepatitis A, Norovirus, and Adenovirus may be present in wastewater and are all capable of causing illness in humans, often requiring very low infective doses to actually cause infection. These viruses represent the most likely risk to public health from primary contact recreation in water contaminated by wastewater effluents, even when the more easily detectable bacteria, such as Enterococci or Thermotolerant Coliforms are only detected at levels which are unlikely to result in direct bacterial infections.

This is especially significant where such recreational waters are known to be impacted by point sources of urban wastewater from unsewered areas and consequent high risk of human faecal contamination. To summarise, where otherwise low levels of faecal contamination are detected, there may well be a significant risk of transmission of viral infections, especially if the source of this faecal contamination is thought or known to be of human origin, rather than, for example, from native wildlife such as shore birds.

The NHMRC Guidelines are based in part upon a World Health Organisation publication (WHO, 2003, Guidelines for Safe Recreational Water Environments – Vol 1 – Coastal and Fresh Waters, Geneva) which provide an A to D risk management classification, based on 95<sup>th</sup> Percentile figures derived from monitoring program results. The classifications are based on the actual observed risk of developing illness such as Gastro Intestinal Illness (GI illness) and/or Acute Febrile Respiratory Infection (AFRI) after primary contact recreation in waters contaminated with a given range of Enterococcus bacteria of human faecal origin. This risk management classification is adopted by both the NHMRC and Tasmanian Guidelines. The NHMRC Guidelines provide in principle for a risk-based approach to recreational water quality classification, linking the decision making process to sanitary survey results combined with microbiological surveys, however neither the NHMRC Guidelines nor the Tasmanian Guidelines provide a clear and objective means of achieving this. The Tasmanian guidelines classify waters in the B category as “Good” despite studies elsewhere which demonstrate significant risks of infection in swimmers using waters in this category.

Cat. A – 95th Percentile <40 orgs/100mL equates to <1% GI illness risk & =<0.3% AFRI risk

Cat. B – 95th Percentile 41-200 orgs/100mL, equates to 1-5% GI illness risk & 0.35-3.95% AFRI risk

Cat. C – 95th Percentile of 201-500 orgs/100mL, equates to 5-10% GI illness risk & 1.9-3.9% AFRI risk

Cat. D – 95th Percentile of >500 orgs/100mL equates to >10% GI illness risk & >3.9% AFRI risk.

The Tas Guidelines combine Categories A and B (i.e. 0-40 and 41-200) into a single “Good” Water Quality Indicator, with Category C described as “Moderate” and Category D as “Poor”. They also provide for a requirement to resample within 48 hours of a sample returning a result greater than 140 Enterococci per 100mL and to “close” Beaches where two consecutive water results exceed 280. The NHMRC Guidelines by contrast define waters in both the C and D Categories as “Poor”.



47 Cole Street, Sorell TAS 7172

PO Box 126, Sorell TAS 7172

**P:** 6269 0000

**E:** [sorell.council@sorell.tas.gov.au](mailto:sorell.council@sorell.tas.gov.au)

**[www.sorell.tas.gov.au](http://www.sorell.tas.gov.au)**