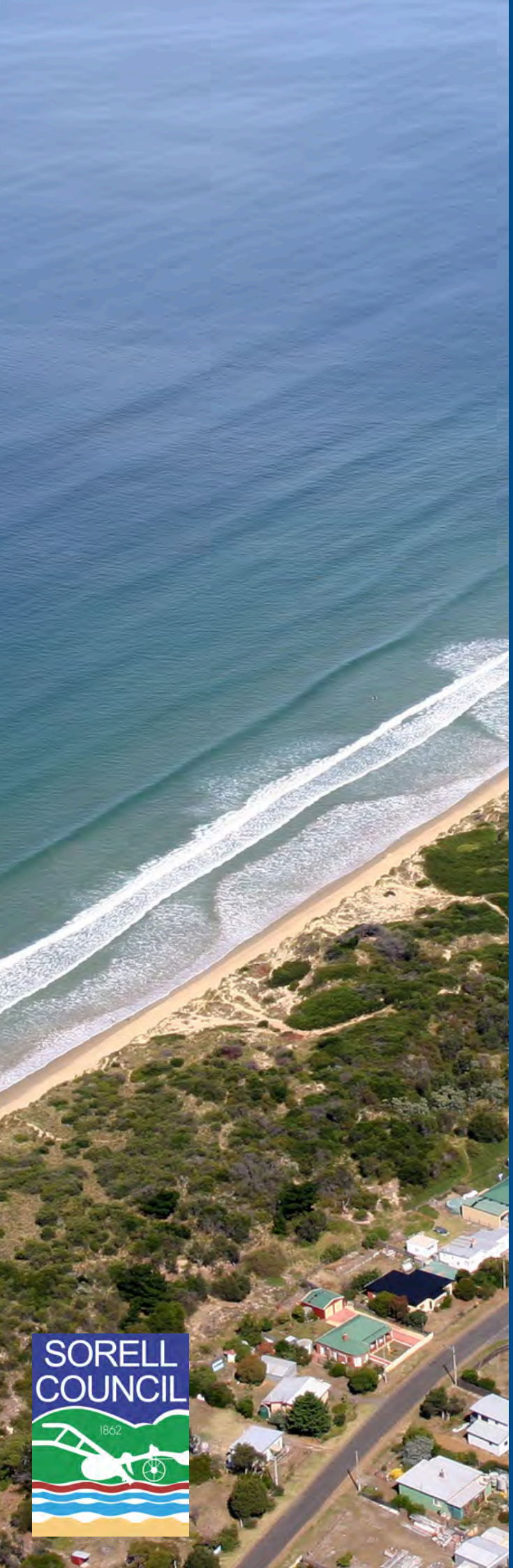
Attachment to item number 20.2-

Recreational Water Quality Monitoring 2024-25



Southern Beaches Recreational Water Quality

Annual **Report**

2024-2025

Prepared By :

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

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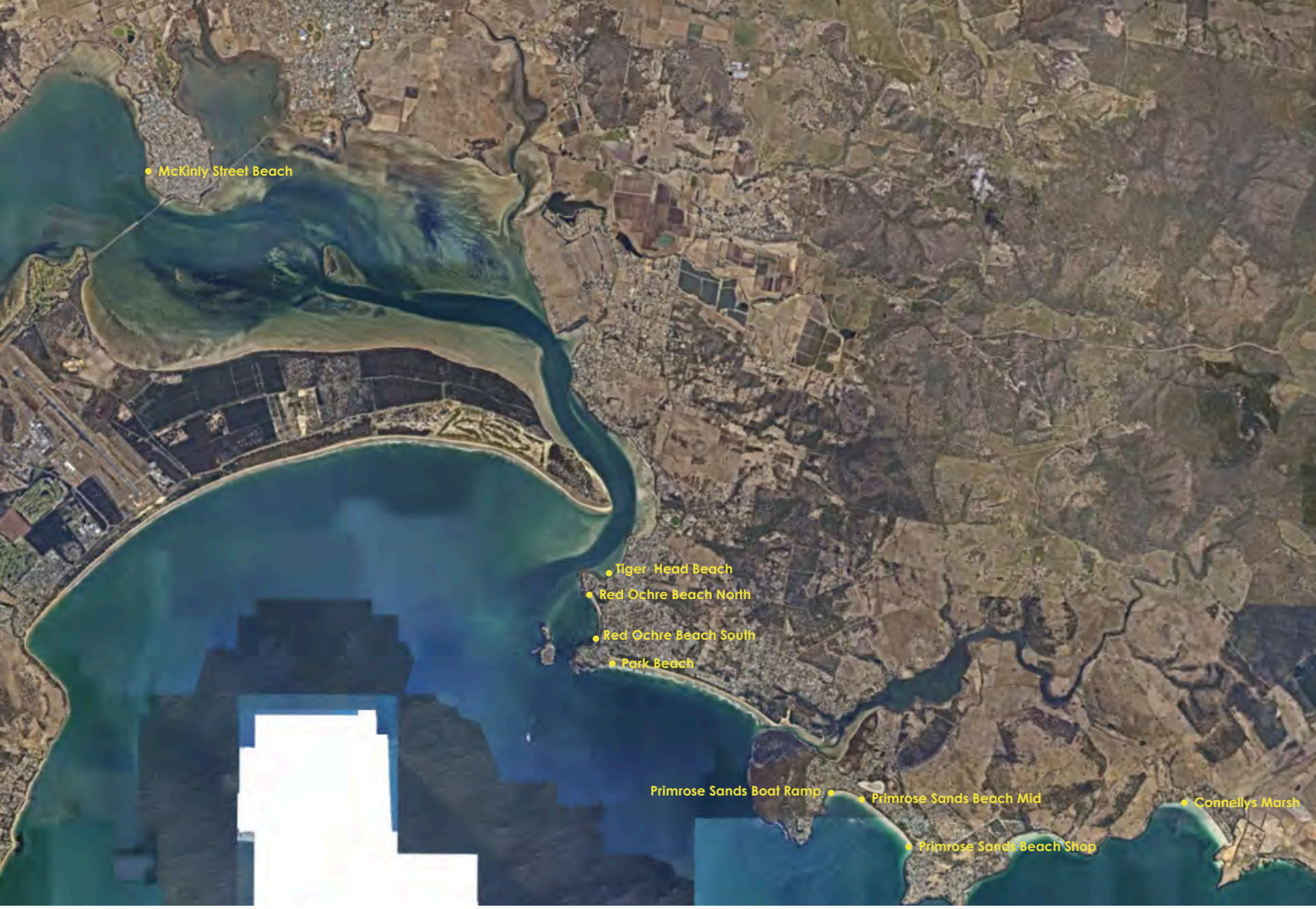

Figure 1 Overview of sampling locations in Sorell Council area. More detailed maps provided in Appendix 1

"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".

CONTENTS

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 r 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^{-1} (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 95th 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 95th 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. Bacteroidies dorei has high specifically 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 (>500MPN100mL/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;

A -7
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 evapotransipiration 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.

A -9
REFERENCES

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10. Derwent Estuary recreational Water Quality Program Annual Report (2024-2025) Draft.
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-cermp-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

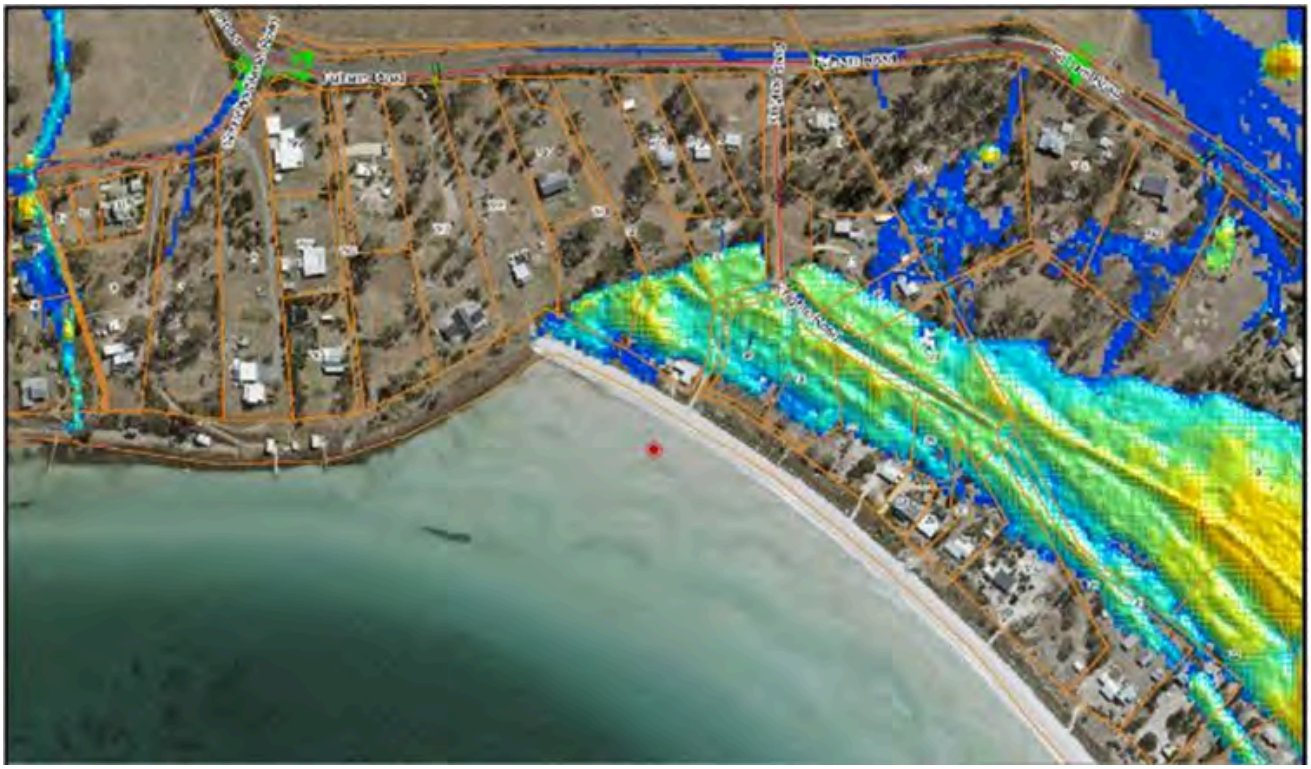

Figure 3 Connellys Marsh showing flood extent and stormwater infrastructure

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

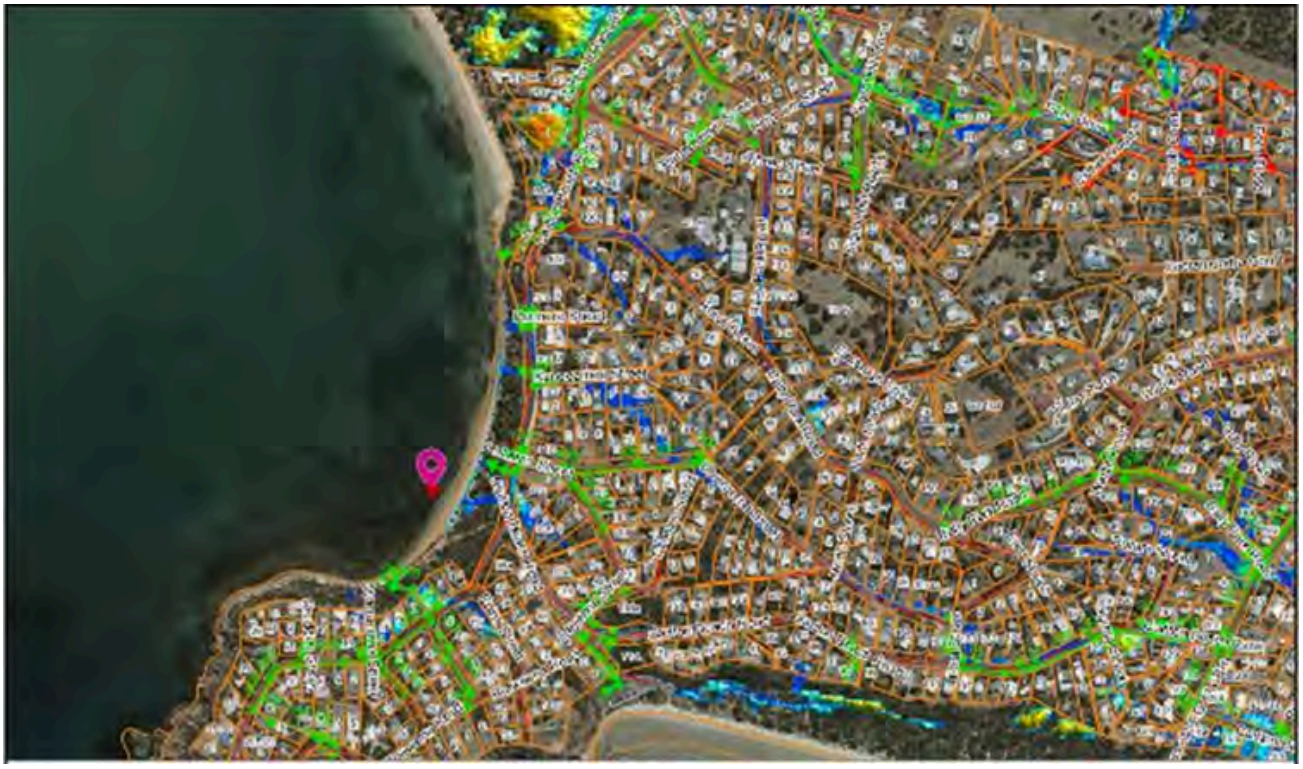

Figure 6 Red Ochre Beach South showing flood extent and stormwater infrastructure

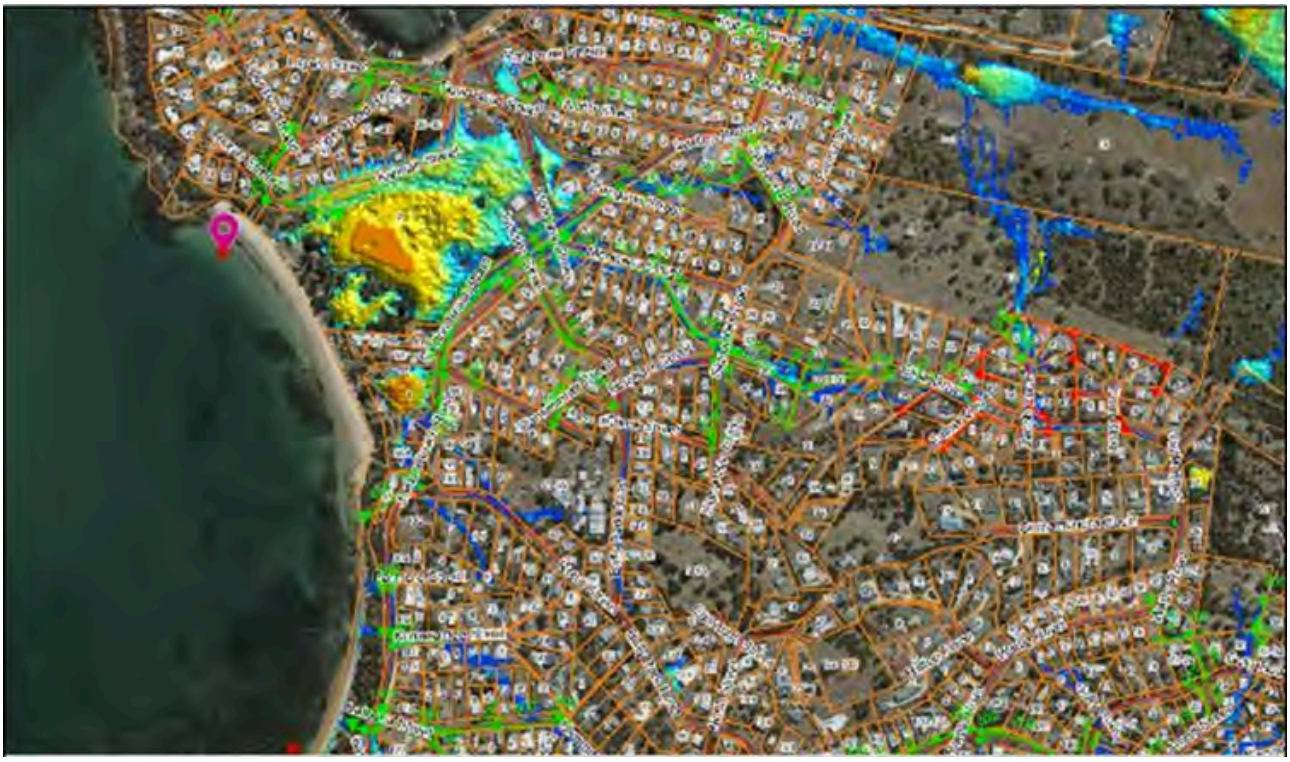

Figure 7 Red Ochre Beach North showing flood extent and stormwater infrastructure

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

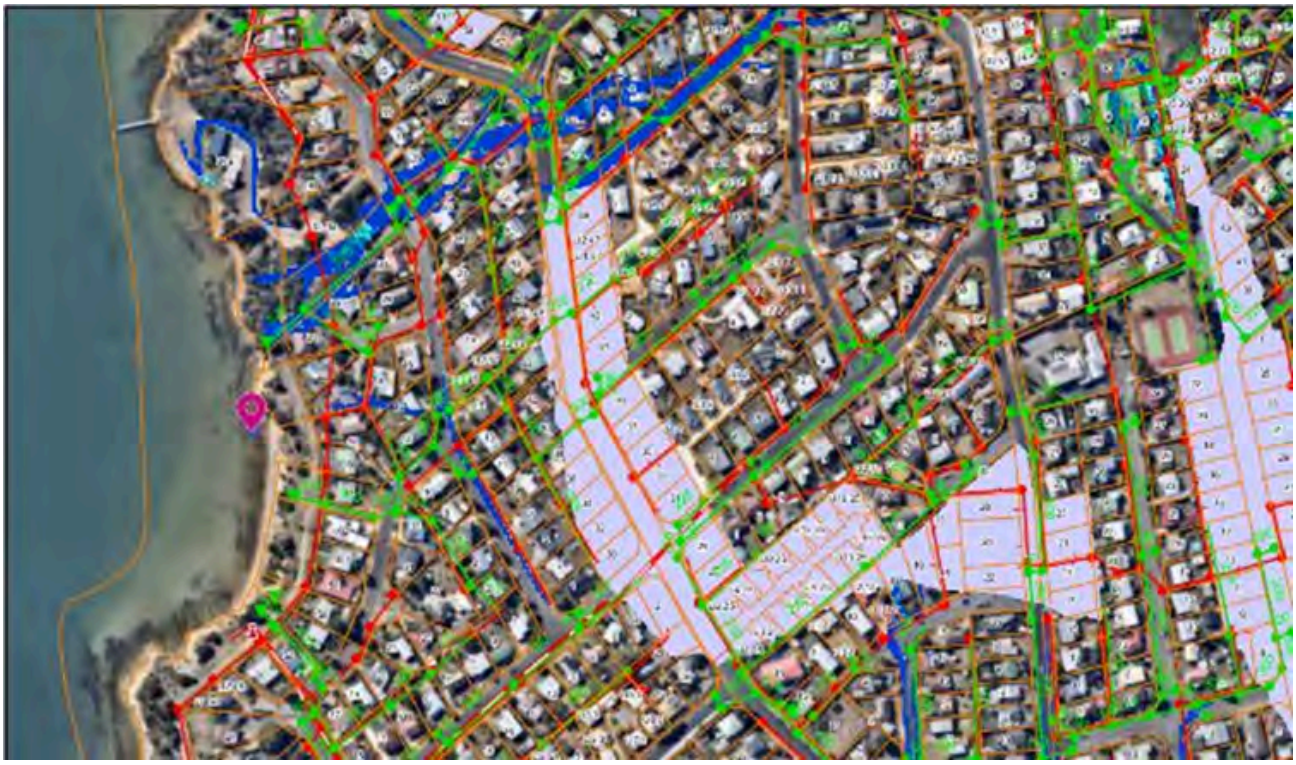

Figure 9 McKinly St Beach sewer in red; stormwater in green, flood risk and waterway shown

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

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

9th to 31st 22.4mm 3 days >1mm

January Average 73.6 mm

2025 18.8mm VERY DRY only 2 days >1mm. The 13th 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 13th 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 95th 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**
≤ 40 A	This range is below the NOAEL in most epidemiological studies.	<1% GI illness risk <0.3% AFRI risk 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.
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	1-5% GI illness risk 0.3-1.9% AFRI risk 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.
201-500 C	This range represents a substantial elevation in the probability of all adverse health outcomes for which dose-response data are available.	5-10% GI illness risk 1.9-3.9% AFRI risk 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.
>500 D	Above this level, there may be a significant risk of high levels of minor illness transmissions.	>10% GI illness risk >3.9% AFRI risk There is a greater than 10% chance of gastroenteritis per single exposure. The AFRI illness rate at the 95th percentile point of >500/100ml would be greater than 39 per 1000 exposures, or greater than approximately 1 in 25 exposures.

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*

		Microbial water quality assessment category (95th percentiles — intestinal enterococci/100 mL)				Exceptional circumstances[c]
		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[b]	Follow up[b]	ACTION
	Low	Very good	Good	Follow up[b]	Follow up[b]	
	Moderate	Good[a]	Good	Poor	Poor	
	High	Good[a]	Fair[a]	Poor	Very poor	
	Very high	Follow up[a]	Fair[a]	Poor	Very poor	
	Exceptional circumstances[c]	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 95th 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".

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Attachment to item number 22.1-

Natural Resource Management (NRM) Strategy 2035 for Sorell Municipality

Natural Resource Management Strategy

2025 - 2035

SORELL COUNCIL
1862

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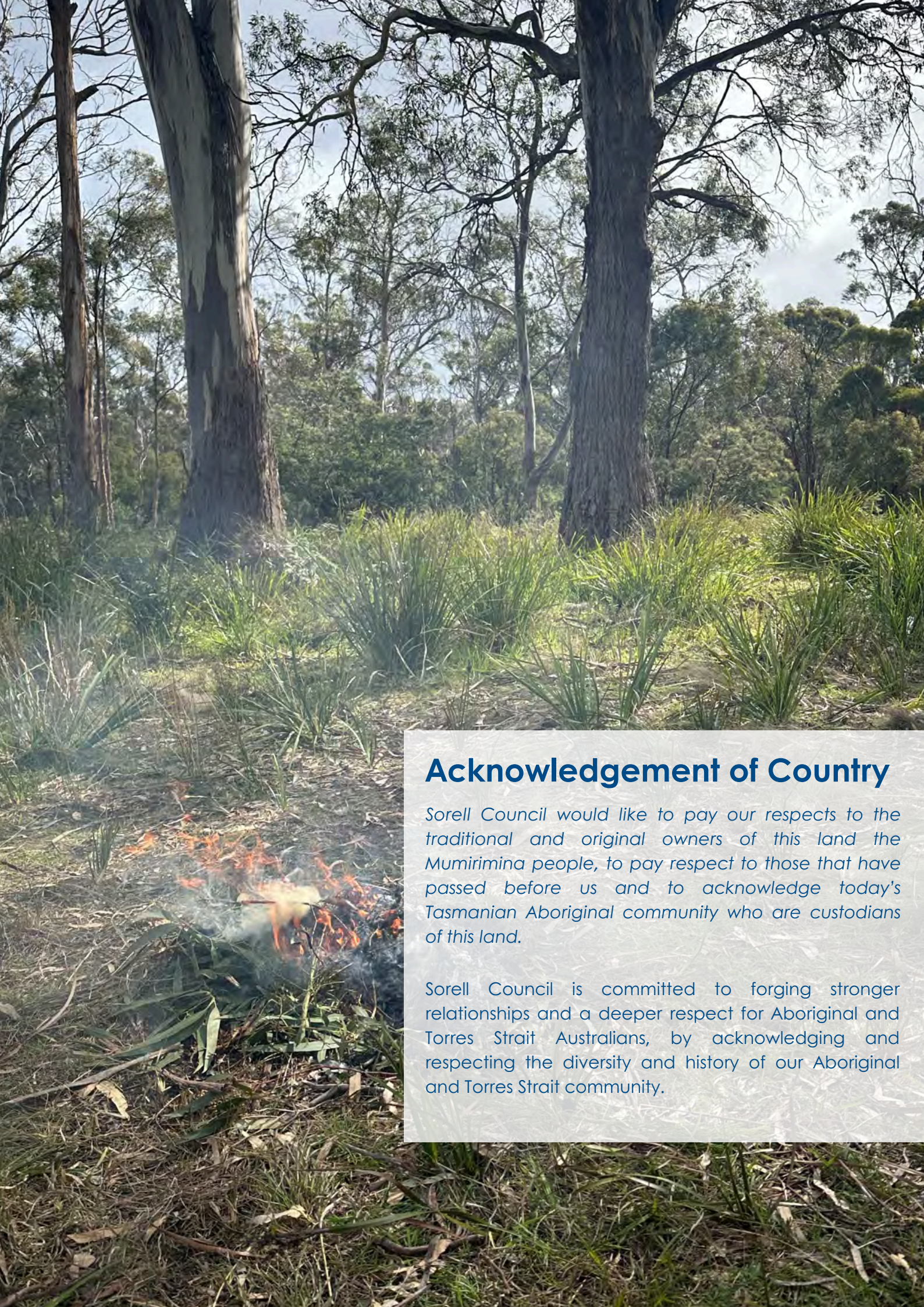


Acknowledgement of Country

Sorell Council would like to pay our 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.

Sorell Council is committed to forging stronger relationships and a deeper respect for Aboriginal and Torres Strait Australians, by acknowledging and respecting the diversity and history of our Aboriginal and Torres Strait community.

INTRODUCTION

Safeguarding our Natural Resources

Sorell Council's Natural Resource Management Strategy (NRM Strategy) guides our actions for the management of land, water and biodiversity within the Sorell local government area (LGA). It will inform Sorell Council policies and actions for the 10 years to 2035.

In developing the strategy we set out to understand our municipality's natural resources so that we can better safeguard them.

Through this process we aim to manage the resources available to us more efficiently, to increase the scope and breadth of natural resource management activities, and to improve environmental sustainability results across Council's operations. The strategy also enhances opportunities for partnership with stakeholders for NRM activities aligned with priority areas.

For a vibrant and thriving region

As stewards and managers of this land and natural resources, our role is to facilitate a vibrant, sustainable and liveable region, where our community is resourced and supported to live, work and flourish in a healthy and protected environment.

Our vision for Sorell is of a proud, thriving and inclusive community. Our values of integrity, innovation, respect and unity guide our approach to achieving that vision.

As a council and a community, we must be honest and transparent about the challenges. Progressing activities outlined in this strategy will require considered use of Council's resources. Being clear eyed about the benefits of key projects will ensure Council is best placed to secure external funding and use those funds on activities that have broad support.

Our strategy will respond to changing climate, environment, needs and opportunities. As actions are implemented, we will adjust to new opportunities and draw on innovations and developments that can offer us ways to do things differently for a shared future.

Natural resource management must be continuous. It relies on respectful collaboration with our many stakeholders, advisors and government agencies, and on the ideas and support of all our community.

In consultation with our community

Creating this strategy is part of an important dialogue where we seek to increase stakeholder participation, understand community concerns and expectations, communicate our vision and plans, and offer education.

We have drawn on input from our Natural Resource Management Environmental Advisory Group and other stakeholders. We thank all those who have responded to our requests for input, offered their expertise and shared their hopes and concerns for our community.

OVERVIEW: SORELL'S RICH NATURAL ASSETS

Community Coast Country

This rich and fertile land and its waterways was home to the Mumirimina people of the Oyster Bay tribe for many thousands of years until dispossessed of their homeland in the early 1800s. European settlement and farming across the district began from 1808 and the town of Sorell was formally established in 1821. The municipal area of Sorell was established in 1862 as a centre of agriculture and trade. Today we are a fast-growing community, with recent growth rates exceeding state averages.

These lands, waterways and skies hold significant cultural and spiritual importance to the traditional owners. They now provide livelihood and amenity to our community.

Sorell is a diverse community, located in what we believe is one of the most beautiful parts of the world. Our municipality covers 58,300 hectares of rolling countryside, low forested hills and long coastlines filled with beautiful beaches.

The land now sustains our community through agricultural, urban, residential, recreational and commercial land uses. Its waters continue to form the focus of our urban, aquaculture, agricultural, recreational and visitor activities.

They are also complex and sometimes fragile ecosystems, some of which provide habitat to rare and endangered species. Wetlands such as the Pitt Water–Orielton Lagoon (PWOL) is significant on a global scale, offering habitat for fish nurseries, migratory and resident birds and aquatic species.

Sorell's climate and landscapes support an immense diversity of flora and fauna. This includes significant threatened species and native vegetation communities, some of which have only recently been identified and documented here.

Agriculture land Forcett. Photograph by Stu Gibson

SNAPSHOT OF SORELL MUNICIPALITY

TOTAL AREA OF LGA

583 km^2

58,300 ha

FAUNA SPECIES

1242 +

More than 1242 Fauna - 39 Species under EPBC 1999, 38 species under TSPA 1995

FLORA SPECIES

1363 +

More than 1363 Flora - 8 Species under EPBC Act 1999, 51 species under TSPA Act 1995

CONSERVATION AREAS INC STATE AND LOCAL RESERVES

1698 ha (total)

Includes 7 formal Council reserves

WETLAND OF INTERNATIONAL SIGNIFICANCE (RAMSAR SITE)

1 3,334 ha

Pitt Water-Orielton Lagoon

OTHER IMPORTANT COASTAL SALTMARSHES

7 183.7 ha

Including Carlton River and Marchwiel Marsh saltmarsh clusters

COASTAL INUNDATION HAZARD

95 %

Of the Shoreline

THREATENED VEGETATION COMMUNITIES

6222 ha (total)

10 under NCA 2002

SHORELINE

179 kms (total)

COASTAL EROSION HAZARD

145 kms

Shoreline at risk

CONSERVATION COVENANTS ON PRIVATE LAND

2045 ha (total)

43 Covenants covering 46 properties

TOTAL AGRICULTURAL AREA

15,328 ha (total)

With a total production value of $5.4m p.a

LANDCARE GROUPS

9

FLORA AND FAUNA

Data from the Natural Values Atlas in 2022 show over 2700 species are found in Sorell, including 1242 species of fauna, 1363 plant species and 84 species of fungus (Although actual numbers are much larger than recorded).

Thirty-nine threatened species have been identified in Sorell. The area is known to include globally significant habitat for populations of critically endangered species including the red handfish and swift parrot. Other significant species include the eastern barred bandicoot and green and gold frog.

Sorell also contains at least 10 out of 39 of the Tasmanian threatened native vegetation communities, including several other of national significance.

Juniper wattle (Acacia ulicifolia). Photograph by Dibas Panta (September 2022).

Juniper wattle

In September 2022, the rare juniper wattle was discovered in the Boomer Bay area. This species was not previously known in the LGA and the finding highlights the continual need to improve the mapping of native vegetation communities and species.

AIM AND APPROACH: MANAGING TO CONSERVE

As a Council, our approach to natural resource management (NRM) seeks to draw on the best available scientific knowledge for programs and activities that improve ecosystem or landscape functions.

In developing our plans for sustainable NRM, we think about both the living and non-living resources that underpin much of our economic and social activity.

We consider our social, economic and cultural interactions with these natural resources as well as the natural processes that may operate to renew natural resources or to disrupt our activities.

Following sustainable NRM principles, we work with these natural systems and processes. We aim to avoid further depleting or degrading resources, and wherever possible, we aim to improve these natural resources and preserve them for future generations.

The Strategy aims to enhance the recognition of natural values by emphasising their social, economic, and environmental benefits, while also incorporating Aboriginal cultural knowledge and practices into resource management. The strategy prioritises the conservation and restoration of biodiversity, including flora, fauna, landscapes, and waterways, to support and enhance natural balance. It promotes stronger collaboration and engagement with stakeholders, encouraging active involvement from communities, government agencies, and private entities.

Additionally, it seeks to raise awareness and support the implementation of management plans. A central focus of the strategy is to address climate change through both adaptation and mitigation measures, fostering resilience and reducing associated risks.

SUSTAINABILITY IN CONTEXT: GLOBAL, NATIONAL AND LOCAL

Sorell's rich natural resources benefit and sustain our community. They also include species and ecosystems that are significant to the planet as a whole.

As a government entity, we operate within multiple overlapping frameworks, legislative schemes and agreements that reflect our complex global systems.

In developing our plans we are bound to consider how our actions and contributions affect our region, our connected environment, and our local, national and international communities.

Our changing climate

Sorell has a maritime climate with mild winters and a small annual temperature range. Average daily maximum temperatures in Summer are around 22.5°C, falling to 12.4°C. Our annual average of 550 mm rainfall is evenly distributed throughout the year with around 40–50 mm each month. However, microclimates vary significantly in the municipality, creating a diverse ecology.

As with the rest of Tasmania, Sorell's long-term average temperatures have risen in the decades since the 1950s, at a rate of up to 0.1°C per decade. Daily minimum temperatures have risen slightly more than daily maximum temperatures.

Since the mid-1970s, there has been a decline in average rainfall, particularly in autumn, and a reduction in numbers of very wet years.

The region experienced drought in 1995–2009 and rainfall in the recent two years has been close to average or slightly below.

Climate change is impacting species range and adversely affecting many native species while creating more favourable conditions for invasive weeds. Sea level rise is bringing coastal inundation and other hazards to coastal communities and infrastructure.

Extreme weather events are likely to increase in frequency and intensity, which is impacting the community, infrastructure and planning at every level.

We must now plan for change.

Sorell Rivulet south towards new bypass road. Photograph by Dibas Panta, August 2022. Image shows the leaf debris watermark left by a recent high flood event that temporarily submerged the Sorell Rivulet walkway.

International agreements and approaches

United Nations Convention on Biological Diversity (CBD): Kumning–Montreal Global Biodiversity Framework (GBF)

The 2022 United Nations Biodiversity Conference of Parties (COP15), concluded with the adoption of a landmark agreement that sets out a nature positive approach. A critical element of the GBF is to go beyond measures to halt nature loss and reduce rates of extinction, and to reverse the causes by improving overall nature. Australia is a party to the UN CBD, which includes some specific nature positive targets and initiatives. Sorell Council acknowledges the adoption of nature positive initiatives and endorses its global targets relevant to this strategy.

United Nations Sustainable Development Goals

The United Nations Sustainable Development Goals comprise 17 goals that were adopted by the UN General Assembly in September 2015 as part of the 2030 Agenda for Sustainable Development. These goals are a call to action for all countries to promote prosperity while protecting the planet, with the aim of ending poverty, fighting inequality, and addressing climate change by 2030.

The goals challenge us to think holistically about the challenges and opportunities we all face, and how projects of work can be designed to support economic, social and environmental development. They stress that plans for meeting health and environmental challenges, transitioning to new energy sources, or developing new skills must not come at the cost of greater inequities.

We have developed Sorell Council's NRM Strategy with a clear understanding of its linkage to these goals, with a particular focus on the following 10 goals.

Regional and State frameworks

At a regional level, as part of Tasmania's NRM South region, Sorell Council is committed to support agreed priority areas under the NRM South strategy, including:

- on-farm native vegetation
- biosecurity
- climate and market resilience
- soils and risk of structural or climate decline or erosion
- environmentally, socially and economically important waterways including Carlton River, Marchwiel Marsh, Boomer Bay, Pitt Water and Orielton Lagoon
- vulnerable coastlines, including beach and dune systems
- temperate coastal saltmarsh
- riparian and remnant vegetation (particularly in urban and peri-urban areas)
- threatened parrots (blue-winged parrots and swift parrots)
- coastal shorebirds (including hooded plover)
- red handfish recovery.

Some regional-scale projects have already been funded under the Australian Government's Regional Land Partnerships Program (RLP). Sorell Council and LGA can benefit from or collaborate with these landscape level projects such as:

- Protecting the breeding population of swift parrots
- Agri-best practice for dryland grazers in the Derwent catchment
- Improved ecological character of Pittwater and Orielton Lagoon Ramsar sites

***Lepidium hyssopifolium* (Soft peppercress) EPBCA listed as endangered species. Photograph by Andrew North**

The Australian Government also funds a range of NRM-related activities including weed management, climate change and species conservation.

Guiding Principles

Our decision making throughout the NRM Strategy and activities is shaped by our guiding principles:

PEOPLE
We recognise that people are an integral part of our ecosystem and play a critical role in management of natural resources.

ABORIGINAL WISDOM
We value and respect thousands of years of Aboriginal knowledge and stewardship that is key to survival of our natural resources and can improve current planning and practices.

LAND USE PLANNING
We understand landscape-level planning is critical to understand and enhance ecosystem services. Local-level implementation is crucial to improve overall land use practices.

SUSTAINABILITY AND NATURAL HEALTH
We recognise sustainability is the core of natural resource management, and use of any natural resources should not impact the future of the natural resources.

COOPERATION AND PARTNERSHIP
We value the importance of partnership between communities, organisations and government to enhance the capacity of NRM activities and increase awareness of the benefits that NRM provides.

STRATEGIC FRAMEWORK: PLANNING FOR LOCAL ACTION

Our framework for managing Sorell's natural resources for the next 10 years is structured around five priority areas, to ensure our actions support our community while meeting our local and international obligations.

Regional and State frameworks

The first three of our five strategies focus on our natural environment and biodiversity, starting with the landscape and land uses that support and enrich our community.

Strategies include programs to protect and restore forest, wetland, and coastal ecosystems. We also include measures to conserve biodiversity and habitats, combat deforestation and reduce or reverse land degradation.

Weeds workshop at Okines Community House

STRATEGY 1 PROTECT NATURAL LANDSCAPE AND PROMOTE SUSTAINABLE LAND USE

Now: challenges and opportunities

Our land is facing threats due to human activities. We need to take steps to halt and reverse damage. We also plan to continue to build on existing positive initiatives. We also see an opportunity to engage and advocate for more comprehensive and targeted approaches at all levels of government so that activities are connected and effective, and not limited to site-by-site approaches.

We have identified particular threats and opportunities to act:

Clearance and fragmentation of habitat reduces biodiversity, increases threats to rare and endangered species and can impact soil and water quality. Where communities and agriculture border native vegetation, we can expect further impacts.

Revegetation can connect patches of fragmented land, increase resilience to pests and diseases, improve soil stability and enhance recreational value through shade and amenity. Council continues to revegetate **land under management** such as at Miena Park.

Open space provides opportunity to connect to nature and conservation. Council's open space and active transport strategies encourage new and improved connectivity. Council has been active in establishing walkway loops within and between towns to support health and recreation.

Swift Parrot

> *"Habitat protection needs to be a top priority in our region ... all fragmented sections of bush should be protected and enhanced as a priority ... as well as looking to establish wildlife corridors and plant more native vegetation."*
> *- Community feedback on NRM Vision Statement (March 2024)*

Chemical contamination alters soil, water and flora, while **physical contamination** introduces weeds, pests and pathogens, all of which require costly management intervention.

Overgrazing, inappropriate fire management and other practices can cause erosion, dieback and other impacts that have high management cost. Dispersive soils are prevalent within Sorell and can lead to tunnel erosion.

The **expanded south-east irrigation scheme** will bring new investment with greater certainty and reliability of water resources for the agricultural industry. These potential changes may lead to industrialisation of conventional agricultural practices.

Federal, state and local regulation can support NRM activities. Regulation that is inadequate or poorly targeted can be costly and ineffectual. While the priority vegetation area in planning schemes utilises the best available data, it does not provide a complete representation of natural values and is constrained by a site-by-site approach.

Wielangta Swift Parrot Important Breeding Area

The critically endangered swift parrot breeds in Tasmania's dry eucalypt forests, particularly in the north-east and south-east regions.

A 2016 study found the swift parrot's habitat had declined by 40% since Europeans arrived in Tasmania, with the remaining habitat being fragmented and degraded. Predation by sugar gliders and competition with other bird species are also threatening its survival.

Studies have identified the Wielangta Forest as an important breeding area and a significant portion of the species' breeding population have been found to rely on this habitat.

Where: vision for 2035

Looking ahead ten years, we want to see our initiatives showing improvements in the landscape itself, and the processes we use as a Council and community to manage the way we use the land. Our vision is that Council-managed land will be showing the benefits of increased coverage of vegetation and providing greater connectivity to key conservation areas. Further, key areas at risk of erosion will be undergoing rehabilitation, including former tips and quarries and known areas of soil instability.

We will have created comprehensive plans for all Council-managed reserves, so that initiatives are coherent and connected. Amended land use planning controls will be operating to appropriately regulate natural values and hazards.

The programs we have developed in collaboration with industries and research organisations will be leading to improved soil and water management in construction, sustainable agricultural practices, and improved monitoring of natural values such as soil health, water quality, tree coverage and weed management.

Walkway Miena Park Sorell

How: our plans and priority actions

1.1 Create habitat corridors within and between private properties, parks and reserves to improve connectivity as recommended by the reserve management plans, open space strategy and other relevant documents.

1.2 Develop a backyard biodiversity program to educate and encourage local landholders to plant their backyard/front lawn to improve biodiversity.

1.3 Increase use of mechanical means of controlling weeds where possible to reduce the application of herbicides.

1.4 Continue to improve the inspection and monitoring of construction sites to ensure compliance with soil and water management plans (SWMP).

1.5 Establish a program, in conjunction with industry, to develop stronger understanding of the extent and effect of agricultural runoff and sustainable land use management measures.

1.6 Facilitate the best practices in agri-businesses that promote carbon neutral or positive businesses or operations.

1.7 Develop strategic landscape management and catchment action plans to reduce reliance on site-by-site assessment and mitigation.

1.8 Engage communities to promote sustainable land use practices.

1.9 Engage with developers and industry stakeholders to enhance knowledge and practices in landscape-level management, particularly in relation to wildlife corridors, priority vegetation areas, and light pollution mitigation.

> *"[The current Tasmanian planning scheme can lead to] fragmentation and destruction of habitat by requiring large parcels of land to be subdivided into successively smaller parcels that are non-functional from an ecological perspective. Could there be a different model that we could lobby for that might allow the larger area to be conserved while allowing the development to be focused into a smaller part of the property at a higher density instead?"*
> *- Community feedback on NRM Vision Statement (March 2024)*

STRATEGY 2 RESTORE AND PRESERVE HEALTHY WATERWAYS AND WATER BODIES

Restoring the health of our rich and vital waterways must be a priority. These have experienced damage due to land use and contamination. However, greater understanding, investment and technology offer opportunities to halt and even reverse the damage. This work will involve extensive engagement and collaboration with a range of project partners including governments, Aboriginal community members, land managers, and community groups such as Landcare.

Now: challenges and opportunities

In particular we need to consider how:

Erosion, vegetation removal and stock access can increase instability of riverbanks or streamside areas leading to erosion and loss of native vegetation and decreasing the ability to withstand flood events. For instance, Sorell Rivulet, Iron Creek and Carlton Rivers are experiencing encroachment and consequently erosion and degradation of streambanks.

Chemical contamination causes alteration of benthic macro and micro invertebrates in water ecosystems. The effects of marine water contamination are generally specific to the site, whereas freshwater contamination might have significant downstream impacts.

Rural and Southern Beaches properties in Sorell Municipality are not connected to a **wastewater treatment** facility and rely on onsite wastewater treatment. This has the risk of contaminating waterbodies directly and indirectly via stormwater. Most of the **stormwater outfalls** are untreated and are not monitored regularly for contamination. Isolated vandalism with **chemicals** in rivulets and waterbodies causes degradation of ecosystem as well as costs to mitigate.

Most **wetlands are at risk of eutrophication** through the influx of nutrients such as nitrates and phosphates from agriculture, irrigation runoff, and other impacts such as weed invasion and siltation from stormwater. Wetland catchments have changed greatly in the last 10 years in Sorell and this has affected the influx of nutrients and silts. Land use changes in any catchment will need to be carefully assessed considering downstream impacts to waterways and water bodies.

> *"Protect our receiving waters and riparian areas and reduce the impact of urban runoff on our waterways. Our waterways are our allies in reducing climate change impacts and improving community satisfaction and quality of life."*
> *- Community feedback on NRM Vision Statement (March 2024)*

Loss of aquatic biodiversity is a considerable challenge in the LGA. The most recent federal State of the Environment Report indicates that the loss of biodiversity is continuing. Many aquatic faunal species are confined to certain areas and are not as mobile as land species. With changing characteristics of water quality, these species struggle to adjust to the changing conditions and diversity is lost. Waterways also spread weed infestations. The National Handfish Recovery Team (NHRT) is active in the Southern Beaches area, supported by federal government.

Loss of habitat is also associated with damage to ecology and loss of biodiversity. The long-term development of areas such as Sorell, Midway Point, Dodges Ferry, Carlton and Primrose Sands have contributed to the loss of habitat. With climate change and other factors in addition to human interference on water resources, we are losing permanent water bodies into intermittent or seasonal waterbodies. More aquatic habitat is lost due to pollution, encroachment, land use change or climate change.

Waterways are regulated by various local and state legislative frameworks, with activities such as water extraction, dams and coastal aquaculture excluded from local planning control.

The planning scheme includes a waterway and coastal protection area which is a buffer area along all waterways. Sorell urgently needs to define sensitive waterways and limit development in catchments.

With advances in technology such as remote sensing and geographic information systems (GIS), we can now analyse landscape-level impacts on wetlands. Such technology greatly increases opportunity for better remote management of the wetlands and waterways. Sorell Council regularly updates aerial imagery and data on the presence of weeds, native vegetation communities, coastal habitat data, threatened species and other environmental values, which has led to better planning outcomes. Research, data gathering and interpretation is ongoing and will improve our level of knowledge and understanding.

Where: vision for 2035

As we look ahead to the effects of our actions and those of our project partners, we aim to see our iconic wetlands being restored and maintained.

Partnership programs will improve our understanding of bird breeding seasons and sensitive habitats and our ability to manage these areas. Campaigns and events will increase community interest in, and understanding of, birds and their habitats.

Erosion or instability of our inland waterways will be minimised, with unstable banks restored. Native riparian vegetation will be maintained and protected against threats from erosion or weed infestation. Integrated catchment management programs will be working to address issues such as water quality, flood management and mitigation, riparian vegetation. We will have developed walkways to improve safety, equal access and connectivity.

Enhanced programs will be implemented for regular monitoring for contamination of waterways, and improving understanding of groundwater resources and potential threats. Council will be working with government and community stakeholders to limit stock access to waterways, and to revegetate and remove weeds, particularly in saltmarsh and culturally important areas. Education programs will improve community understanding of contamination risks and their impacts on aquatic flora and fauna.

On-ground works affecting waterways will be conducted so as to consider and protect Aboriginal cultural and heritage values and sites.

We will be progressively mitigating environmental risks to Council infrastructure .

Critically endangered Red Handfish. Photograph by Jamina Stuart-Smith

Red Handfish

Sorell LGA has the last remaining populations of critically endangered red handfish in the world. The entire adult population was estimated at about 100 in 2019. The species is highly isolated and only found in two locations across south-east Tasmania.

Sites of historical and remnant populations suggest that red handfish live on shallow, protected rocky reefs. Seagrass areas adjacent to the reef may provide important nursery habitat for juveniles.

Red handfish used to be common across south-eastern Tasmania and on the north coast. Threats including fragmentation of habitat, habitat degradation caused by urbanisation, population pressure, competition from sea urchin, and climate change have pushed the species to the brink. Since the population size is extremely small and isolated, exceptional care must be taken in their potential habitat.

Conservation efforts are underway. Institute of Marine and Antarctic Studies (IMAS) at University of Tasmania (UTAS) has successfully hatched 50 babies in the aquarium. However, in-situ conservation is both critical to maintaining a healthy population and a more cost-effective way of conserving the species.

How: our plans and priority actions

2.1 Work with local communities and Landcare groups to reactivate waterwatch programs.

2.2 Implement periodic risk-based monitoring and water quality testing for major waterways.

2.3 Review waterway buffers in the planning scheme to determine coverage or riparian vegetation.

2.4 Establish a campaign with landowners to educate and support public awareness on flood management and riparian ecology.

2.5 Engage with the Aboriginal community on promoting traditional land management practices.

2.6 Establish co-management programs for wetlands and waterways to reflect the sensitive use of water.

2.7 Implement programs in partnership with regional NRM bodies to improve riparian ecology on key waterways including Sorell Rivulet, Orielton Rivulet, Iron Creek, Frogmore Creek, Marchwiel Marsh and Carlton River saltmarsh.

2.8 Recognise the importance of saltmarshes and work with the communities to enhance their health and sustainability.

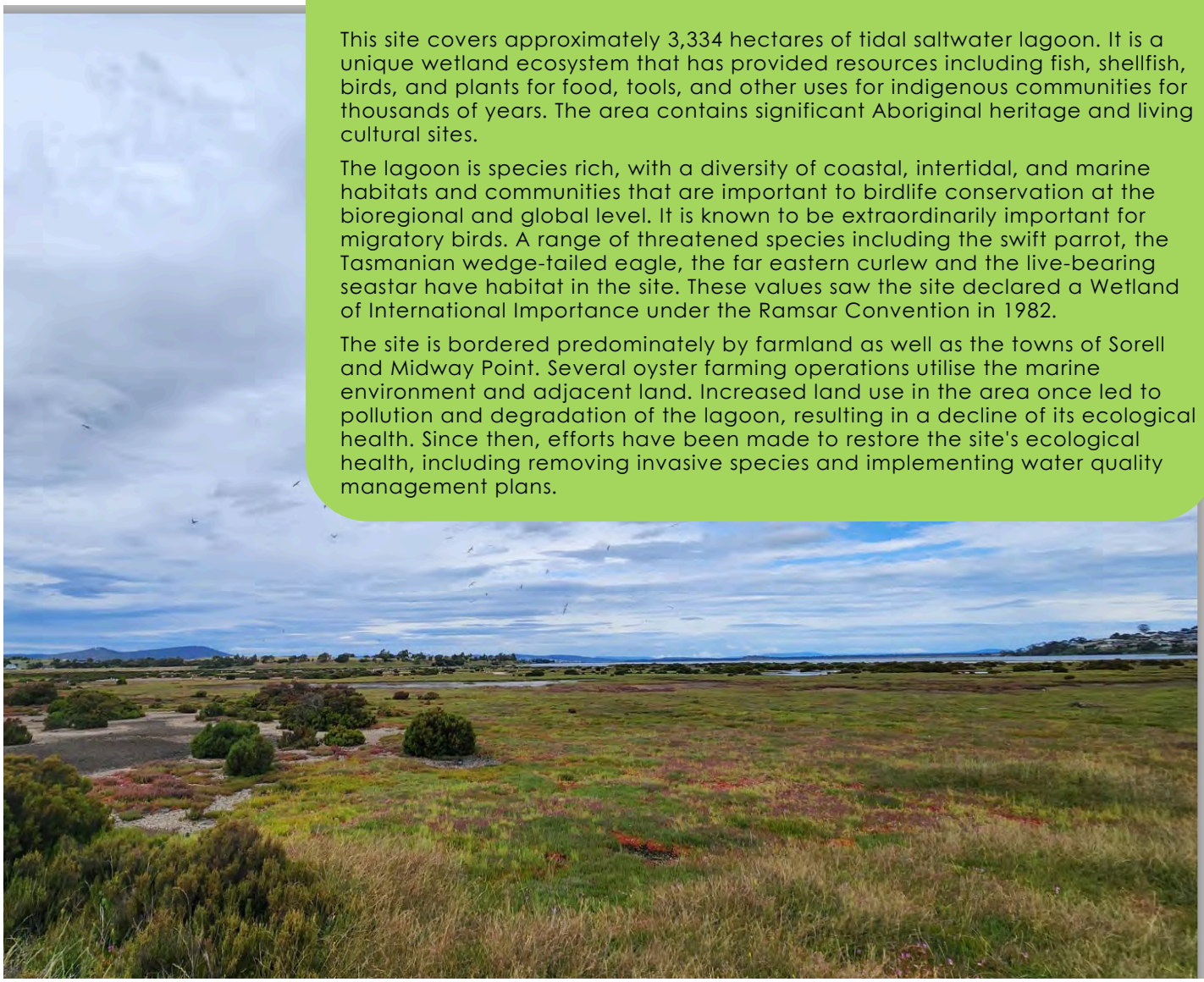
2.9 Engage communities on the maintenance of wastewater systems and their effects on local waterways.

The Pitt Water–Orielton Lagoon (PWOL) Ramsar site

This site covers approximately 3,334 hectares of tidal saltwater lagoon. It is a unique wetland ecosystem that has provided resources including fish, shellfish, birds, and plants for food, tools, and other uses for indigenous communities for thousands of years. The area contains significant Aboriginal heritage and living cultural sites.

The lagoon is species rich, with a diversity of coastal, intertidal, and marine habitats and communities that are important to birdlife conservation at the bioregional and global level. It is known to be extraordinarily important for migratory birds. A range of threatened species including the swift parrot, the Tasmanian wedge-tailed eagle, the far eastern curlew and the live-bearing seastar have habitat in the site. These values saw the site declared a Wetland of International Importance under the Ramsar Convention in 1982.

The site is bordered predominately by farmland as well as the towns of Sorell and Midway Point. Several oyster farming operations utilise the marine environment and adjacent land. Increased land use in the area once led to pollution and degradation of the lagoon, resulting in a decline of its ecological health. Since then, efforts have been made to restore the site's ecological health, including removing invasive species and implementing water quality management plans.



STRATEGY 3 CONSERVE BIODIVERSITY AND MANAGE INVASIVE SPECIES

With many of our natural systems now under pressure and out of balance, we recognise the urgency of actions to protect and restore Sorell's extensive and wide-ranging biodiversity values, habitats and ecosystems.

Our strategy includes measures to address threats posed by invasive species of plants and animals. Urban expansion poses challenges to biodiversity. However, with more than one-third of threatened species living in urban and semiurban areas, planners and homeowners have local opportunities to act on conservation. We include measures to engage with community and take advantage of every opportunity to conserve remnant vegetation and protect and improve biodiversity.

Now: challenges and opportunities

We need to consider how:

As dwelling sizes and numbers increase and **demand for housing** remains high, pressure on remnant vegetation will increase, leading to further fragmentation and degradation. This will also reduce stormwater and wastewater on-site capacities. Conversely, projects like Backyard Biodiversity initiatives by Council can enhance the remnant vegetation and encourage community members to protect critical habitats.

Gaps in our knowledge of local biodiversity and on how to best manage particular species, communities and landscapes reduce the effectiveness of NRM activities. Research, training, partnerships, networking and communication are important to best manage biodiversity. Groups like Southern Tasmania Councils Authority and Urban Tree Managers Forum can bridge that gap in knowledge and provide opportunities to implement best practices.

Climate change will adversely impact native vegetation while encouraging invasive species. Local mitigation and adaptation will be crucial to reduce the negative impacts on biodiversity, as will effective management of Council land under changing scenarios. Sorell Council's Climate Change Adaptation Plan (Nov 2024) considers biodiversity as well as the human perspective.

Competition from domestic species is having a significant impact on biodiversity. Recent changes to state legislation will reduce numbers of **feral cats** over time but will not eradicate them completely. The promotion of **responsible cat ownership** and other controls are important to reduce impacts on biodiversity. **Abandoned Poultry** and **Rabbits** compete with native species for food and shelter causing decline in native populations.

> *"There is huge opportunity to create a resilient environment from households out. Backyards for wildlife, for climate change, for waterway and farmland protection could be one of the most impactful ways to achieve our goals together, one backyard at a time."*
> *-Community feedback on NRM Vision Statement (March 2024)*

Bigger, stronger and more adaptive hybrid **ducks** compete with native ducks in our waterways. An increase in the **deer** population has caused significant degradation in our pasture and increased competition with native grazers. Escaped Pigs are causing serious damage to ecosystems and having significant financial burden to neighbouring LGAs.

Cat feeding on wildlife

Weed management through biosecurity regulation is administered by the Tasmanian Government but is not fully understood by land owners and communities. Weed management enforcement falls to Council with limited resources.

Infrastructure and transport management represents a challenge. This can cause tensions, for example where natural values such as remnant trees that exist within Council road reservations can pose an increasing risk to traffic safety over time.

Where: vision for 2035

Over the next ten years we see our actions and our education and engagement campaigns taking effect so that our actions as a community support and enhance biodiversity.

At that time our land use and infrastructure planning processes will incorporate biodiversity as a key component.

Support for specific programs such as the handfish recovery program will be in place. Targeted research programs will be enhancing and sharing knowledge of biodiversity values, and campaigns addressing Tasmanian threatened species legislation will be raising awareness and increasing compliance.

> *"Empower community members to be informed and involved in weed management, invasive species management and responsible pet ownership."*
> *-Community feedback on NRM Vision Statement (March 2024)*

Effective education campaigns will have increased community awareness of responsible cat ownership behaviours and legislative obligations. Along with this, programs will be in place to improve monitoring and understanding of the impacts of feral animals.

A weed management strategy and weed action plan will be delivering benefits of more effective use of weed, pest and disease hygiene practices.

Feasible offset policies and actions will be identified for infrastructure and development projects.

Dodges Ferry Recreation Reserve

DODGES FERRY RECREATION RESERVE

Approximately 12 hectares in size, the reserve is the largest area of remnant native bushland within Dodges Ferry. Previous expert surveys have identified this reserve as having 'Extremely High' conservation significance.

It is believed to be used by threatened species including the eastern barred bandicoot and masked owl and may also be habitat for the swift parrot and some threatened orchids.

In 2023, local Landcare volunteers established weekly hand-weeding sessions which have reduced invasive species while improving soil health and native flora and fauna. The 'Flora Park Tuesday Weeders' were recognised in the 2024 Australia Day Awards.

How: our plans and priority actions

3.1 Implement a campaign to increase community engagement in citizen science for Sorell which can improve inventory for biodiversity.

3.2 Establish strong partnerships with research institutes to increase the understanding of climate change impacts on native flora and fauna species and on communities.

3.3 Improve our understanding of best practice mitigation strategies for key species and communities.

3.4 Continue to work with Landcare Tasmania, Tassie Cat, Ten Lives and Birchgrove Feline Assistance to educate and manage the impact of stray/feral cats.

3.5 Establish a campaign in partnership with conservation group(s) and Landcare to increase public awareness and education on fallow deer and on hybridisation of pacific black ducks.

3.6 Amend the Tree Management Policy to include significant trees and tree felling protocol.

3.7 Review and Implement policies and procedures such as the Roadside Spraying and Mowing Policy to ensure they accommodate site specific conditions and Council contractors are informed of and act accordingly.

3.8 Seek opportunities to identify and protect appropriate sites to increase and enhance Council reserve assets.

3.9 Encourage the implementation of Aboriginal land use practices to protect and enhance biodiversity.

Mayor Janet Gatehouse being presented with Award for Excellence - Photo by Local Government Associate of Tasmania

STRATEGY 4 PREPARE FOR A CHANGING CLIMATE

Our NRM Strategy includes steps to minimise or mitigate climate-change risks wherever possible. It also includes plans to manage infrastructure as extreme weather events become more likely. For example, planning to replace or maintain infrastructure more frequently, and considering other measures such as signposting or community warnings to ensure public safety.

Council's own operations can lead by example, setting clear targets for reducing greenhouse gas emissions. We can improve energy efficiency in municipal buildings and services and increase or adopt renewable energy sources like solar and wind power.

Integrating and enforcing robust land use and zoning policies will also help minimise climate change-related risks to our community from events such as flooding and extreme heat.

Now: challenges and opportunities

Sorell's strong social and economic connections to coastal and agricultural areas, and significant natural values, lead to a high level of **vulnerability to climate change.**

Productivity of agricultural lands and wetlands will be greatly reduced and desertification of our pasture will be more likely. Adaptive agriculture and pasture management will be critical in responding to climate change.

Sea level rise is bringing **coastal erosion and coastal inundation** to coastal communities. With most communities in the municipality located near the coastline, Sorell can expect significant impacts.

Local risk and adaptation planning and local responses to sea level rise and changed rainfall and heat patterns will differ. Understanding the local response across beaches, coastlines, towns and agricultural sub-regions is an important step towards building resilient communities.

Remediation works eroded sand dune

Our **beaches and dune systems** provide important recreational and natural values. Some are **highly exposed to erosion** and geomorphological change.

The Sorell Risk Register identifies 72 types of **risks from natural hazards** that may impact life, property, social services and emergency responses. Further understanding these risks and mitigation options requires knowledge and collaboration.

Older infrastructure and buildings were not designed for extreme weather events or rainfall variability associated with climate change. This may lead to risks of failure, risk to life or private property, reduced asset life and increased maintenance costs. It may also lead to erosion or damage to land, and reduced water quality. The Stormwater System Management Plan, for example, identifies a number of such infrastructure projects.

A changing climate will provide opportunities for **invasive species** and displace native species and increase the vulnerability of some of the species by changing the phenology of the species, which will attract **disease and pests**.

We are more capable than ever of **understanding and forecasting** the extreme events and planning and implementing adaptations. **Research and new technologies and materials** will help increase climate resilience and increase our social and financial capacity to respond before and after events.

Planning for **climate change and energy considerations can be integrated into private development**. Good design provides a cost-effective way to reduce energy inputs and achieve high levels of comfort. Long-term investments in alternative energy sources such as solar panels or battery electric vehicles will reduce dependence on non-renewables, with investments demonstrating sound business case forecasts. EV charging is available in Sorell (December 2024) as well as Dunalley (March, 2023).

Community groups are aware and proactive in response to climate change events and may be an option to assist in case of extreme events.

Council can significantly **reduce waste diversion to landfill** by implementing FOGO-recycling initiatives to direct wastes to composting that can be used in Council's operations and in the community.

> *"Install EV charging at the Council car park to lead the way and prepare for fleet changeover to EV as well as provide a convenient charging point at the community precinct."*
> *- Community feedback on NRM Vision Statement (March 2024)*

EV Charging Station Neil Davis Place Sorell

Where: vision for 2035

With actions to address climate change increasingly urgent, our vision for 2035 is that mitigation actions will be well underway. By then Council's climate change strategy and implementation plan will be operating and we will be taking advantage of opportunities to reduce the organisational carbon footprint.

Local vulnerabilities to climate change will be understood and documented. Governance structures will be in place to respond to erosion events. Council infrastructure will have been inspected and upgraded where necessary to increase resilience to climate change. Design and construction of climate-responsive buildings and works will be underway.

Clearly these actions will require co-operation. We expect Council will be partnering with stakeholders and state and federal government on climate resilience, and pursuing opportunities for research funding, such as grants to better understand localised responses to climate change and sea level rise.

Work will be ongoing to update the Natural Hazards Risk Register and to progress mitigation measures.

Revegetation work on coastal area

How: our plans and priority actions

4.1 Work with agencies to ensure access to best available data on shoreline responses to climate change.

4.2 Implement the Climate Change Adaptation Plan (endorsed November 2024).

4.3 Develop tools and provide regular training to assist staff and Councillors understand how climate change will impact natural assets, infrastructure and the community.

4.4 Establish new processes and resources to improve grant submissions and increase access to funding for climate change mitigation projects.

4.5 In conjunction with the Mitigating Natural Hazards through Land Use Planning project run by DPAC, identify dune environments under Council or Crown management, and prioritise these in terms of risk.

4.6 Develop management strategies associated with public access, vegetation, stormwater outfalls and other variables to maintain or enhance resilience to storm events.

4.7 Implement learning from the project under the Australian Government Coastal and Estuarine Risk Mitigation Program to other outfalls in the Southern Beaches region.

4.8 Undertake a project to evaluate existing coastal protection assets and develop a methodology to prioritise Council coastal works and asset management actions.

4.9 Consult with Renewables, Climate and Future Industries Tasmania (ReCFIT) and regional partner bodies to develop the knowledge base on climate data.

4.10 Educate communities with practical knowledge and actions to prepare for and adapt to climate change.

Remediation work on coastal erosion

STRATEGY 5 ENGAGE AND SUPPORT COMMUNITY

Our work through this strategy strives to help create connection, promote equality, and reduce poverty and inequities within and among communities. We need to ensure our approaches are inclusive and equitable, addressing the needs of groups who may be vulnerable or marginalised.

We can create more resilient and sustainable urban environments through measures such as promoting green infrastructure, energy-efficient buildings, and sustainable transportation. Our incentives and policies can help all in our community benefit from clean energy generation and consumption.

Council hosted Community workshop

Council hosted Community workshop

Now: challenges and opportunities

Local communities are increasingly involved in land and water management within their locality. This offers **opportunities to collaborate.**

However, there is a **partnership gap** between community groups and the work of Council. Formed in November 2023, a local NRM Environmental Advisory Group now facilitates the implementation of the NRM Strategy and is enhancing cooperation, partnership and resource efficiency between community groups and local government.

Community awareness of natural resources and sustainability is increasing. This influences consumer choice, lifestyle choice and expectations of local, state and federal governments. Sorell has a number of stakeholder groups who are active in the management of public land.

Council has participated in or organised **events** such as World Wetland Day, Clean Up Australia Day, and weed management training. These events are effective in raising awareness of issues and in supporting direct community action.

Sorell has significant Aboriginal heritage and cultural sites. Through our Indigenous communities, we have access to **vast knowledge of land management** which can be used to protect and enhance the landscape and land use.

Many NRM activities are **funded by grants**, such as the $1.8 million federal grant to reduce erosion and water quality risks of stormwater outfalls, and weed action plans.

Where: vision for 2035

Our vision is of strong and resilient community, whose collaborative efforts to manage and preserve our natural resources are co-ordinated through an advisory group established to oversee the application of this NRM Strategy.

The effects of our programs will see Council and community groups collaborating to manage council land, wetlands and waterways, particularly through activities such as weed and invasive species control, and restoration of disturbed areas. We will also see enhanced collaboration and communication with Crown land managers particularly for cross-tenure activities such as weed management, public access and coastal erosion management. Increased financial and technical support will be available for land managers and community groups involved in monitoring, management and restoration works.

Engagement will also involve the agriculture, aquaculture and other industries working together better understand the positive and negative impacts of these activities and how they are managed.

We will be exploring opportunities to develop and trial interventions in areas such as water quality, soil health, nutrients, carbon, and tree cover are being explored.

Education and collaboration opportunities will lead to awareness of natural resource values and risks throughout the community as a whole. Increased investment in NRM-related activities will also support increased participation by community members.

How: our plans and priority actions

> *"Not only do the public want to be informed about works and comment on possibilities, we are looking to be empowered to manage our own land and help manage public spaces. Consider educational material, physical on-the-ground support, workshops and events."*
> *- Community feedback on NRM Vision Statement (March 2024)*

5.1 Continue the NRM Environmental Advisory Group role in providing ongoing NRM Strategy advice and support, evaluating progress, and helping build community awareness and support for NRM initiatives. The group first met on 29 November 2023 and terms of reference are available on the Council website.

5.2 Continue and strengthen the NRM Facilitator role to implement Council's NRM related policies and strategies

5.3 Advocate for the implementation of the NRM Strategy in council workshops and community group meetings.

5.4 Provide frequent updates about changes in policies and practices through community events and programs.

5.5 Continue to review and update reserve management plans, community engagement and other ways for Council to work in partnership with local Landcare groups to manage council-owned reserves.

5.6 Implement a program to support research organisations and universities to analyse the impacts on wetlands and provide recommendations.

5.7 Partner with research organisations and universities to collaborate on research opportunities and publication.

5.8 Establish workshops with agriculture, aquaculture and other industries on relevant biodiversity topics.

5.9 Increase funding to volunteer groups to encourage NRM-related activities.

5.10 Advocate with State Government to provide a greater investment in protecting natural values on crown land.

REPORTING AND REVIEW:

The implementation of this Natural Resource Management (NRM) Strategy will be guided by the Sorell Council's established NRM Advisory Group. The Advisory Group brings together a range of expertise and local knowledge, including representatives from Council, community organisations, landholders, youth, and subject matter experts, to provide independent guidance and oversight throughout the life of the Strategy.

The Strategy will be delivered through a detailed Action Plan, which will set out specific projects, programs, and priorities aligned with the five key strategic themes:

- Protect natural landscapes and promote sustainable land use
- Restore and preserve healthy waterways and water bodies
- Conserve biodiversity and manage invasive species
- Prepare for a changing climate
- Engage and support community

Progress will be reviewed regularly by the Advisory Group against clearly defined indicators. Council will work closely with the Advisory Group to monitor implementation, track achievements, and identify areas where adaptive management may be needed to respond to new challenges or opportunities.

To ensure transparency and maintain strong community involvement, Council will update progress to the community through Council Meetings and various other communication channels, including Council's website, seasonal newsletters, community bulletins, and public events. These updates will allow ongoing opportunities for community feedback, input, and participation as the Strategy evolves over time.

The Strategy's implementation will follow the precautionary principle — taking early action in the face of uncertainty, considering a range of alternatives, and fostering broad community engagement to safeguard Sorell's natural assets for current and future generations.

GLOSSARY OF TERMS:

Action Plan
A document that outlines specific projects, responsibilities, timeframes, and performance measures to deliver the goals of the NRM Strategy.

Biodiversity
The variety of all living organisms – including plants, animals, fungi, and microorganisms – and the ecosystems they form.

Climate Adaptation
The process of adjusting systems, communities, and infrastructure to cope with current or expected effects of climate change.

Climate Resilience
The ability of ecosystems, infrastructure, and communities to withstand and recover from climate-related disturbances.

Community Engagement
Active involvement of local residents, landholders, groups, and stakeholders in planning, decision-making, and delivery of NRM activities.

Connectivity (Habitat Corridors)
Natural linkages between habitat areas that allow movement of wildlife and genetic diversity, supporting healthier ecosystems.

Ecosystem
A system formed by the interaction of living organisms with each other and with their physical environment such as air, soil, and water.

Conservation Covenant
A legal agreement attached to a property title that commits landholders to protect and manage natural values on their land.

Feral Species
Introduced animals that have established wild populations and may negatively impact native species and ecosystems.

Invasive Species
Non-native plants, animals, or pathogens that spread rapidly and threaten local ecosystems, biodiversity, or land uses.

Landcare / Coastcare
Volunteer community groups that care for the land and coastal environments through hands-on work, education, and stewardship.

Natural Resource Management (NRM)
The sustainable care and management of natural assets such as land, water, biodiversity, and coastal areas for the benefit of present and future generations.

NRMEAG
A Council-appointed group of community members, experts, and stakeholders that provides guidance and oversight for the implementation of the NRM Strategy.

Precautionary Principle
A principle promoting early action to prevent environmental harm where there is scientific uncertainty, encouraging careful decision-making and broad community involvement.

Riparian Zone
The land area alongside rivers, streams, or wetlands, important for water quality, habitat, and bank stability.

Stakeholders
Individuals, organisations, or groups with an interest in or who are affected by NRM decisions and outcomes.

Sustainability
Managing natural, social, and economic resources to meet present needs while preserving their availability for future generations.

Urbanisation Pressures
The environmental impacts caused by expanding urban development, including loss of natural areas, increased pollution, and habitat fragmentation.

Waterwatch
A community-based program involving schools, volunteers, and local organisations to monitor water quality and promote waterway health.

ACRONYMS

COP15 - Conference of Parties 15th Conference
DPAC - Department of Premier and Cabinet
EV - Electric Vehicle
FOGO - Food Organics, Garden Organics
GBF - Global Biodiversity Framework
GIS - Geographic Information System
IBA - Important Bird Area
IMAS - Institute of Marine and Antarctic Studies
LGA - Local Government Area
NHRT - National Handfish Recovery Team
NRM - Natural Resource Management
NRMEAG - Natural Resource Management Environmental Advisory Group
PWOL - Pitt Water-Orielton Lagoon
RecFIT - Renewables, Climate and Future Industries Tasmania
RLP - Regional Land Use Partnership Program
SWMP - Soil and Water Management Plan
UTAS - University of Tasmania
UN CBD - United Nations Convention on Biological Diversity

VERSION CONTROL

Version	Name	Date	Comment
1.0	Dibas Panta	26/9/2024	First draft
1.1	Catherine Hughes	01/10/2024	Structural edit
2.0	Catherine Hughes	23/10/2024	Copy edit
2.1	Dibas Panta	07/11/2024	Comments
3.0	Catherine Hughes	08/11/2024	Revised draft
4.0	Catherine Hughes	19/11/2024	Clean version for consultation
4.1	Dibas Panta/Melinda Reed	08/12/2024	NRMEAG comments
5.0	Catherine Hughes	16/12/2024	Final draft
5.1	Jo Cooper	28/04/2025	Final edits
5.2	Community Feedback	31/05/2025	Review and edits
6.0		04/6/2025	Final Document

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