Beachwatch

State of the beaches 2023–24

Illawarra region

Department of Climate Change,
Energy, the Environment and Water

NSW GOVERNMENT

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

This resource may contain images or names of deceased persons in photographs or historical content.

Artist and designer Nikita Ridgeway from Aboriginal design agency Boss Lady Creative Designs created the People and Community symbol.

Cover photo: Stanwell Park Beach, Wollongong. Beachwatch/DCCEEW

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Contents

Recreational water quality has been monitored in the Illawarra region since 1996 by Sydney Water, and by Wollongong City Council and Kiama Municipal Council under the Department of Climate Change, Energy, the Environment and Water's Beachwatch Partnership Program. This report summarises the performance of 21 swimming sites in the Illawarra region of New South Wales, providing a long-term assessment of how suitable a site is for swimming. Monitored sites include ocean beaches and a designated swimming site in Lake Illawarra.

In 2023–2024, 95% of swimming sites in the Illawarra region were graded as Good or Very Good. These sites were suitable for swimming for most or almost all of the time. This is an excellent result, and a similar performance to previous years.

Illawarra region summary 2023–2024

Surf Beach Kiama

Photo: Beachwatch/DCCEEW

Monitoring water quality for swimming in New South Wales

The water quality of beaches and other swimming locations is monitored under the NSW Government's Beachwatch programs to provide the community with accurate information on the cleanliness of the water and to enable individuals to make informed decisions about where and when to swim. Routine assessment also measures the impact of pollution sources, enables the effectiveness of stormwater and wastewater management practices to be assessed and highlights areas where further work is needed.

Swimming sites in New South Wales are graded as Very Good, Good, Fair, Poor or Very Poor in accordance with the National Health and Medical Research Council's 2008 *Guidelines for Managing Risks in Recreational Waters*. These Beach Suitability Grades provide a long-term assessment of how suitable a beach is for swimming. The grades are determined from the most recent 100 water quality results (2–4 years' worth of data depending on the sampling frequency) and a risk assessment of potential pollution sources.

See the section on **Quality assurance** in the Statewide Summary for results of the quality assurance program.

Recreational water quality has been monitored in the Illawarra region by Sydney Water since 1996, and Wollongong City Council and Kiama Municipal Council since 2011.

A **quality assurance** program ensures the information collected and reported by Beachwatch and its partners is accurate and reliable.

Rainfall impacts

During 2023–2024, 21 swimming sites were monitored including ocean beaches and a designated swimming site in Lake Illawarra.

Rainfall is the major driver of pollution to recreational waters, generating stormwater runoff and triggering untreated discharges from the wastewater treatment and transport systems. Changes in rainfall patterns are reflected in beach water quality over time due to variation in the frequency and extent of stormwater and wastewater inputs.

The Beach Suitability Grades for 2023–2024 are based on water quality data collected over the last 2–4 years. Rainfall over this period has been diverse:

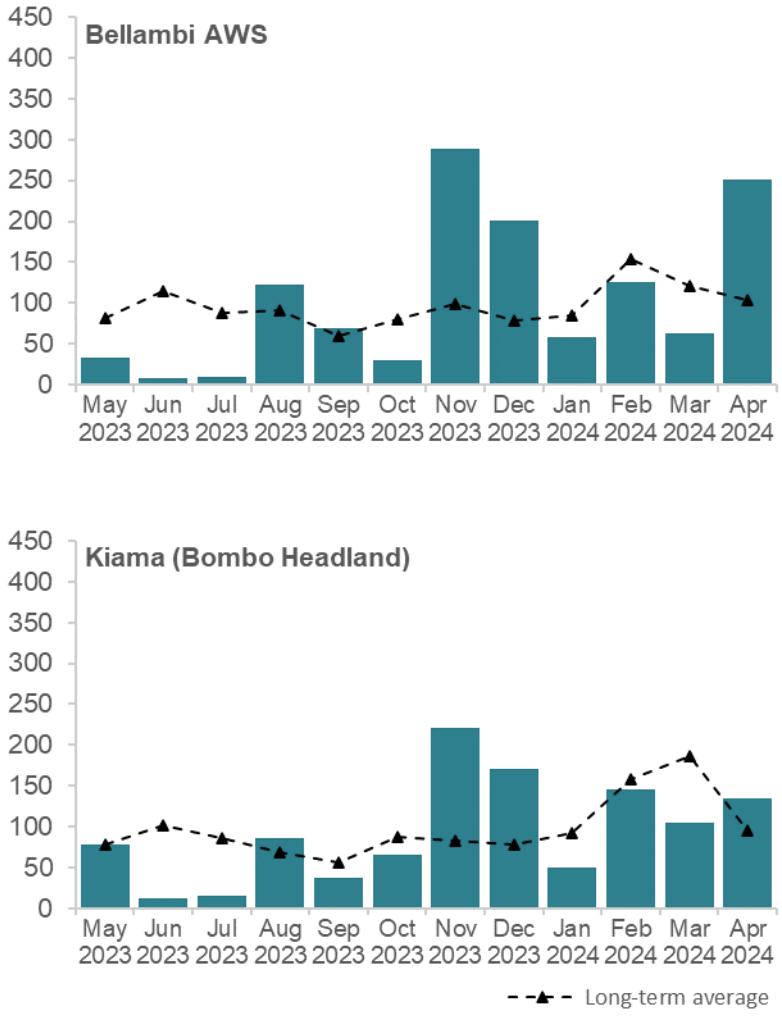
- 2020–2021: variable rainfall with some wet months
- 2021–2022: a very wet summer and autumn, including significant wet weather and flooding events
- 2022–2023: a very wet winter and spring, and some significant rainfall events associated with storms during summer
- 2023–2024: mostly average to below average rainfall, except for some isolated wet months.

See the section on **How to read this report** on page 38 for an explanation of the graphs, tables and Beach Suitability Grades.

Rainfall on the Illawarra Coast was mostly average to below average for the 2023–2024 reporting year, except for some isolated wet months. Well above average rainfall fell in November and December 2023 and April 2024 across the region.

November and December 2023 were notably wet. Bellambi recorded its highest November daily rainfall of 154.8 mm on 5 November, its record highest November total rainfall of 289.2 mm, and its record highest December total rainfall of 200.8 mm. Similarly, Bellambi recorded its highest April daily rainfall of 194.8 mm on 6 April.

Illawarra region rainfall



Marine algal bloom present in the water

Photo: Chad Weston/NPWS, DCCEEW

Algal blooms

Water NSW reported a caution alert for a marine algae bloom, *Trichodesmium* sp., in December 2023 at Belmore Basin in Wollongong. Marine algae advisories were issued on the Water NSW website.

The appearance of **marine algae** is sometimes mistaken for **sewage contamination** or **oil slicks**, due to a strong odour and red or brown discolouration in the water caused by the blooms.

As a precaution, direct contact with algae should be avoided as it can cause skin and eye irritations. The

marine algal blooms dissipated with changes in tide and wind conditions.

Beachwatch issues daily **beach pollution forecasts** to enable beach goers to make informed decisions about where and when to swim.
Pollution forecasts for the Illawarra beaches can be accessed via the Beachwatch website, email subscription, X (formerly Twitter) and Facebook.

Health risks

Contamination of recreational waters with faecal material from animal and human sources can pose significant health problems to beach users owing to the presence of pathogens (disease-causing micro-organisms) in the faecal material. The most common groups of pathogens found in recreational waters are bacteria, protozoans and viruses.

Exposure to contaminated water can cause gastroenteritis, with symptoms including vomiting, diarrhoea, stomach-ache, nausea, headache and fever. Eye, ear, skin and upper respiratory tract infections can also be contracted when pathogens come into contact with small breaks and tears in the skin or ruptures of the delicate membranes in the ear or nose.

Certain groups of users may be more vulnerable to microbial infection than others. Children, the elderly, people with compromised immune systems, tourists, and people from culturally and linguistically diverse backgrounds are generally most at risk.

Beach Suitability Grades for Illawarra region

Swimming site	Site type	Beach Suitability Grade	Change
Wollongong City Council			
Stanwell Park Beach	Ocean beach	VG	○
Coledale Beach	Ocean beach	VG	○
Austinmer Beach	Ocean beach	VG	○
Thirroul Beach	Ocean beach	G	○
Bulli Beach	Ocean beach	G	○
Woonona Beach	Ocean beach	VG	○
Bellambi Beach	Ocean beach	G	○
Corrimal Beach	Ocean beach	G	○
North Wollongong Beach	Ocean beach	G	○
Wollongong City Beach	Ocean beach	VG	○
Coniston Beach	Ocean beach	VG	↑
Fishermans Beach	Ocean beach	VG	○
Port Kembla Beach	Ocean beach	G	○
Shellharbour City Council			
Entrance Lagoon Beach	Lake/Lagoon	P	○
Warilla Beach	Ocean beach	VG	↑
Shellharbour Beach	Ocean beach	VG	○
Kiama Municipal Council			
Boyds Jones Beach	Ocean beach	VG	↑
Bombo Beach	Ocean beach	VG	↑
Surf Beach Kiama	Ocean beach	G	○
Werri Beach	Ocean beach	VG	↑
Seven Mile Beach (Gerroa)	Ocean beach	G	○


Beach Suitability Grade
Change
VG
Very Good
G
Good
F
Fair
P
Poor
VP
Very Poor
Improved
Stable
Declined

Wollongong City Council

100%
ocean beaches graded Good or Very Good

Overall results

All 13 swimming sites were graded as Very Good or Good in 2023–2024. Excellent results have been recorded for many years.

Percentage of sites graded as Very Good or Good

	2021–2022	2022–2023	2023–2024	Trend
Ocean beaches (13 sites)	100%	100%	**100%**	—

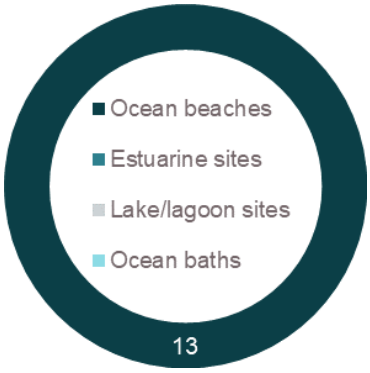
Eleven locations were monitored by Sydney Water. Samples were collected every sixth day throughout the year at 9 locations, and 2 locations were monitored every sixth day between October and April.
Two locations were monitored by Wollongong City Council. Samples were collected every sixth day (excluding weekends) between October and April and sampling and laboratory analysis was fully funded by the council.

See the section on **How to read this report** on page 38 for an explanation of the graphs, tables and Beach Suitability Grades.

Best beaches

Stanwell Park Beach, Coledale Beach, Austinmer Beach, Woonona Beach, Coniston Beach, Wollongong City Beach and Fishermans Beach.

These sites had excellent water quality and were suitable for swimming almost all of the time.



Site types in Wollongong City Council

Ocean beaches were the only site type monitored in the Wollongong region.

As a general precaution swimming should be avoided during and for at least one day after heavy rain at ocean beaches, or if there are signs of stormwater pollution such as discoloured water or floating debris.

Ocean beaches

Beach Suitability Grades for Wollongong City Council ocean beaches

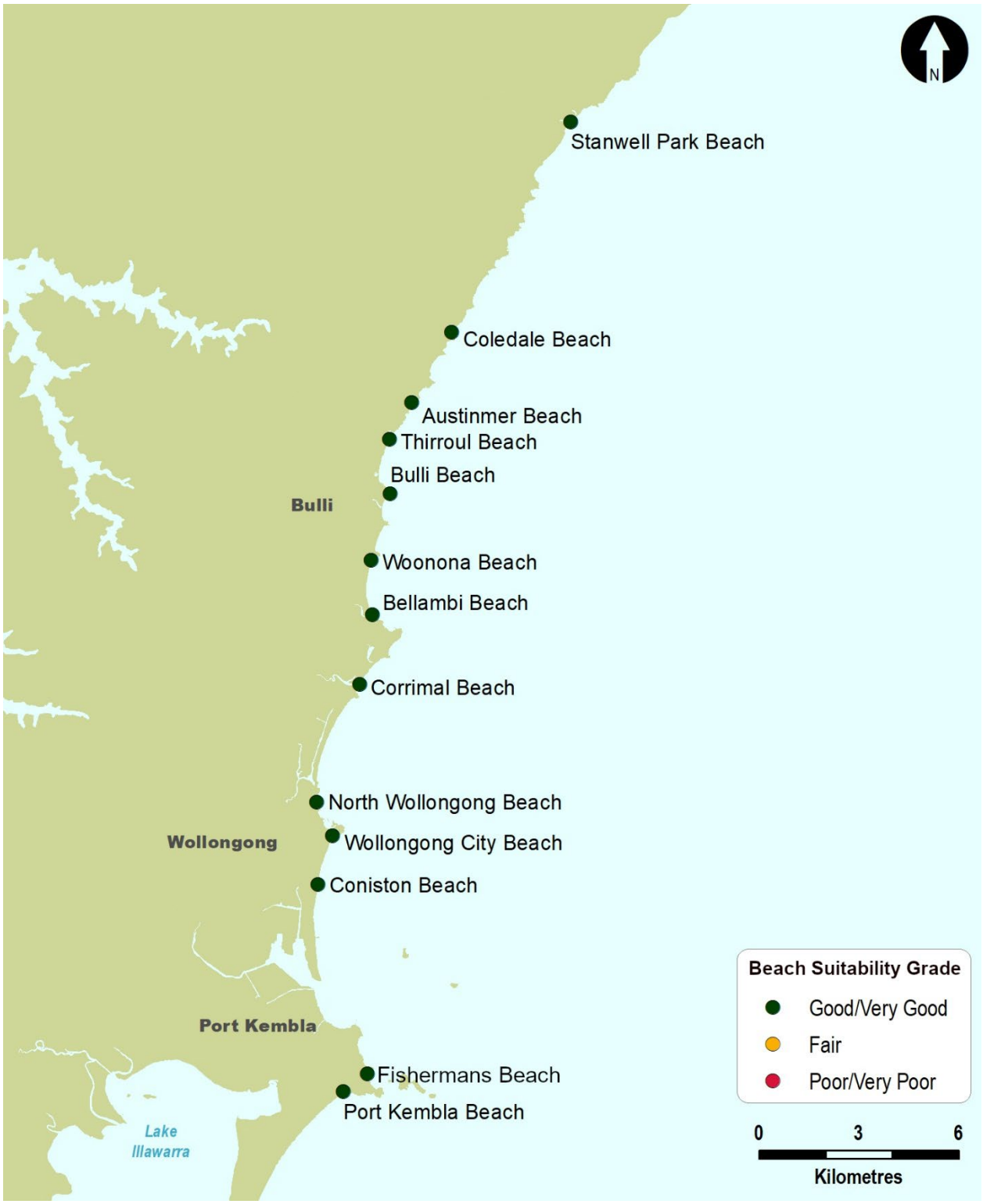
All 13 ocean beaches continued to be graded as Very Good or Good in 2023–2024.

Seven beaches were graded as Very Good: Stanwell Park Beach, Coledale Beach, Austinmer Beach, Woonona Beach, Coniston Beach, Wollongong City Beach and Fishermans Beach. Water quality at these beaches is suitable for swimming almost all of the time. Coniston Beach improved to Very Good from Good in the previous year due to improved microbial water quality.

Thirroul Beach, Bulli Beach, Bellambi Beach, Corrimal Beach, North Wollongong Beach and Port Kembla Beach continued to be graded as Good in 2023–2024. Water quality at these sites was frequently suitable for swimming during dry weather conditions. However, enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit after moderate to heavy rainfall.

Many of these sites have several, or more significant, potential sources of pollution such as stormwater or upstream sources discharged from creeks or lagoons. Discharges from storm sewage treatment plants (SSTPs) at Bellambi and Port Kembla may also affect the water quality at nearby beaches following heavy rainfall.

It is recommended that swimming be avoided at these beaches during and for up to one day following rainfall, or if there are signs of pollution such as discoloured water, flowing drains or floating debris.



Sampling sites and Beach Suitability Grades in Wollongong City Council

Stanwell Park Beach

Beach grade: VG

See 'How to read this report' for key to map.

The beach is 700 m long and is backed by dunes and a reserve. Lifeguards patrol the beach from September to April.

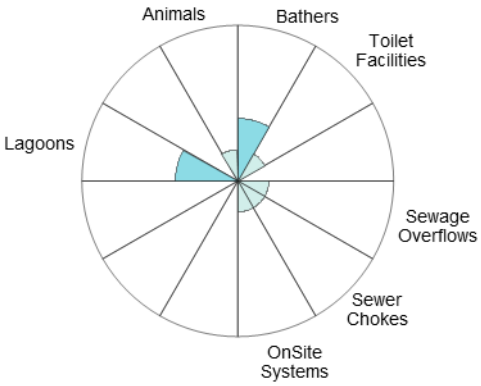
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit in response to 5 mm or more of rain, and often after 20 mm or more.

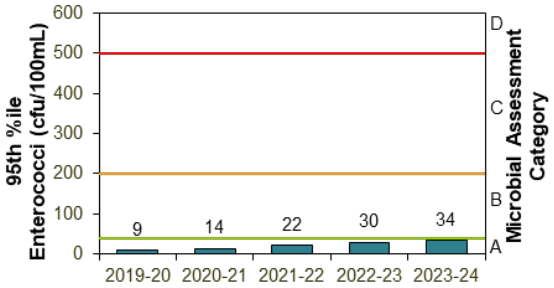
The site has been monitored since 2011.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Oct 2019 to Apr 2024	96%	100	Stable

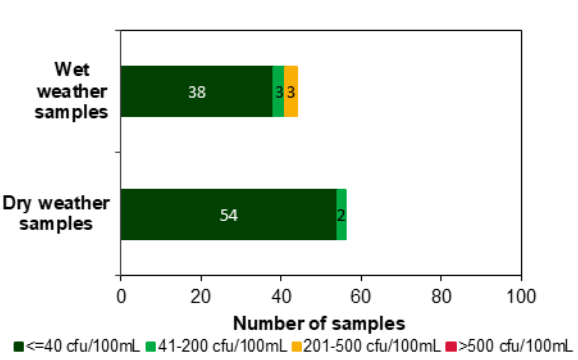
Sanitary inspection: Low



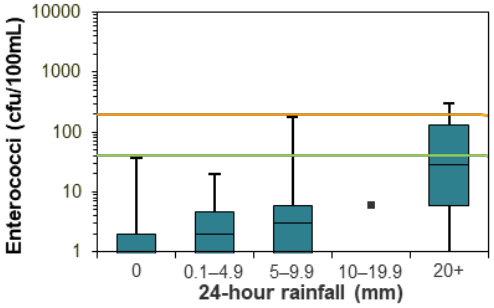
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Coledale Beach

Beach grade: VG

See 'How to read this report' for key to map.

Coledale Beach is 300 m long and is backed by a small grass reserve and campsite. Lifeguards patrol the beach from September to April.

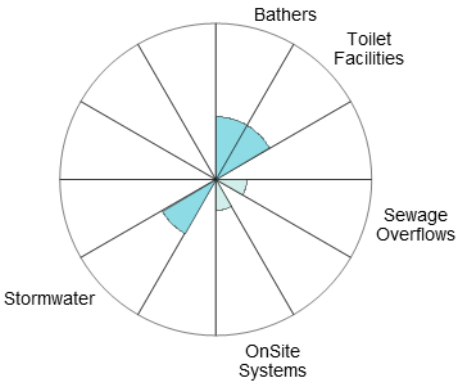
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain and often after 20 mm or more.

The site has been monitored since 2011.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Oct 2019 to Apr 2024	100%	100	Stable

Sanitary inspection: Low



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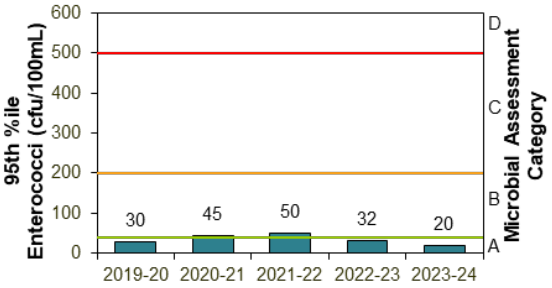
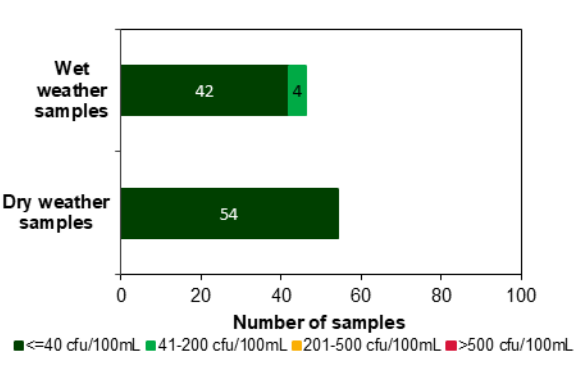
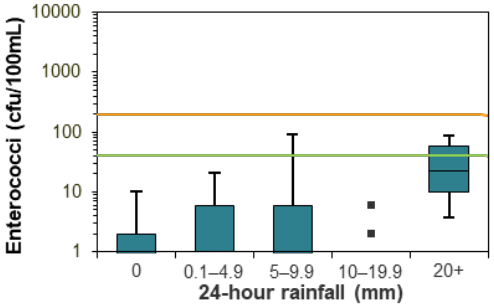


Dry and wet weather water quality



Water quality in response to rainfall



Austinmer Beach

Beach grade: VG

See 'How to read this report' for key to map.

Austinmer is a small beach with ocean baths on the southern rock platform. Lifeguards patrol the beach from September to April.

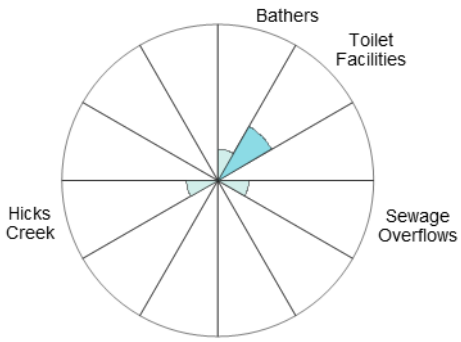
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 5 mm or more of rain.

The site has been monitored since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Oct 2021 to Apr 2024	96%	100	Stable

Sanitary inspection: Low



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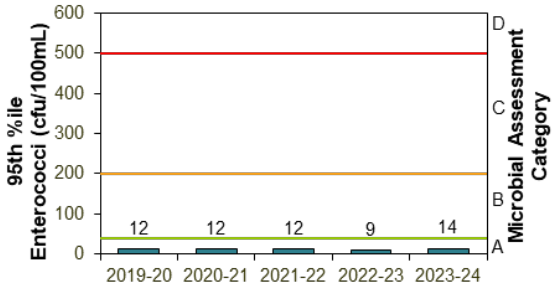
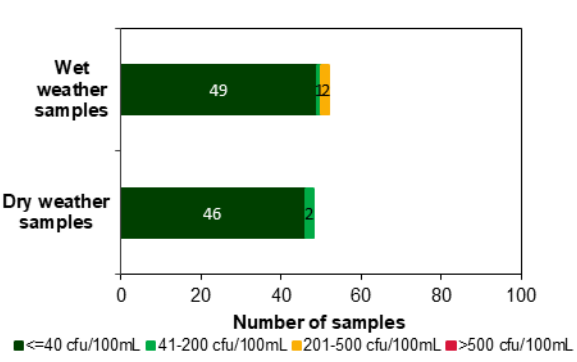
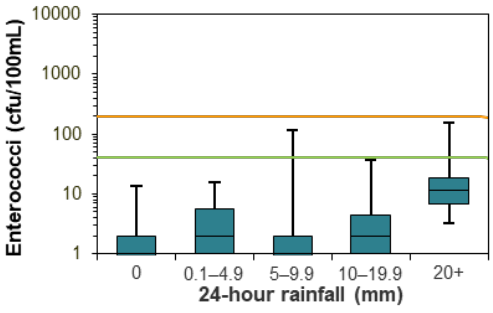


Dry and wet weather water quality



Water quality in response to rainfall



Thirroul Beach

Beach grade: G

See 'How to read this report' for key to map.

Thirroul Beach is 1 km long and backed by a grassed reserve. Lifeguards patrol the beach from September to April.

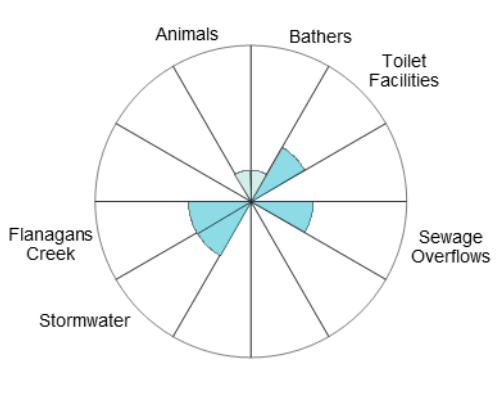
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, from several potential sources of faecal contamination including stormwater and Flanagans Creek.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 10 mm or more of rain and often after 20 mm or more.

The site has been monitored since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Oct 2021 to Apr 2024	96%	100	Stable

Sanitary inspection: Moderate



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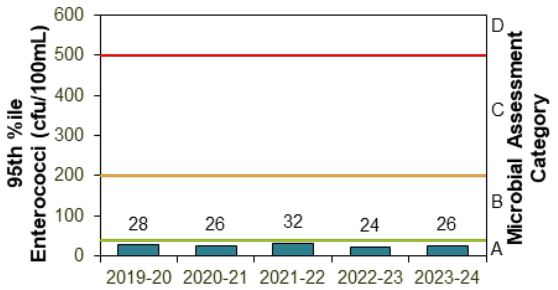
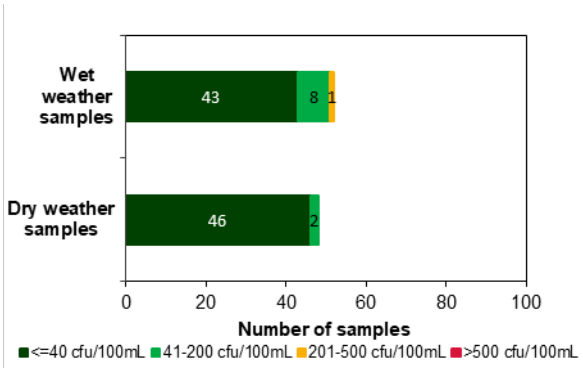
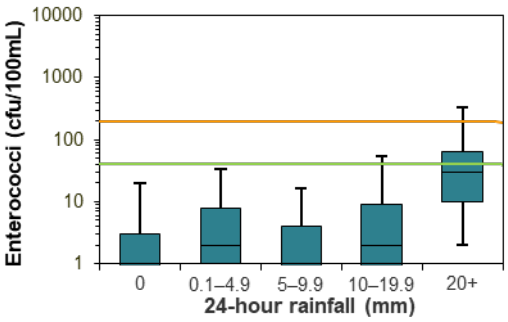


Dry and wet weather water quality

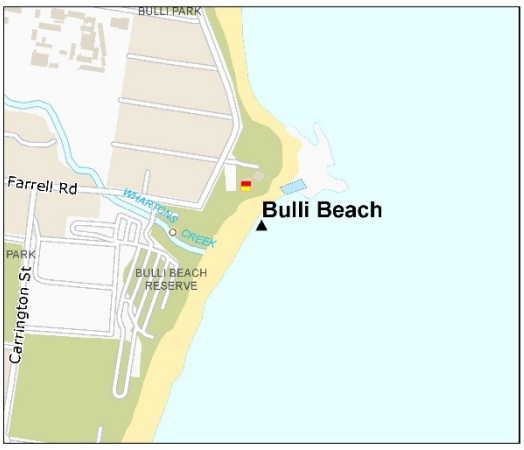


Water quality in response to rainfall



Bulli Beach

Beach grade: G



See 'How to read this report' for key to map.

Bulli beach is at the northern end of a 900 m long beach. The beach is patrolled from September to April.

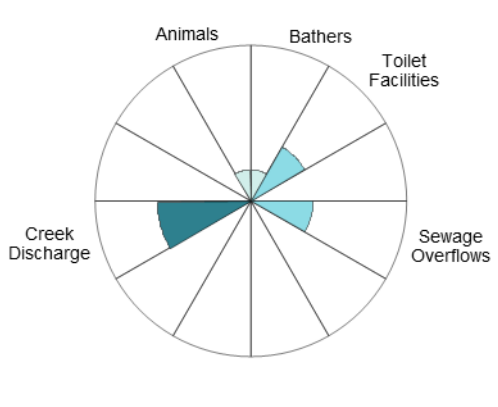
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination, including discharge from Whartons Creek.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain, and often after 20 mm or more.

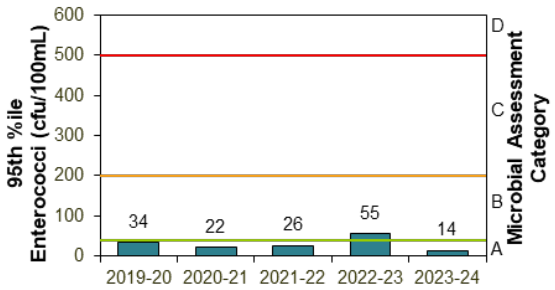
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	100%	100	Stable

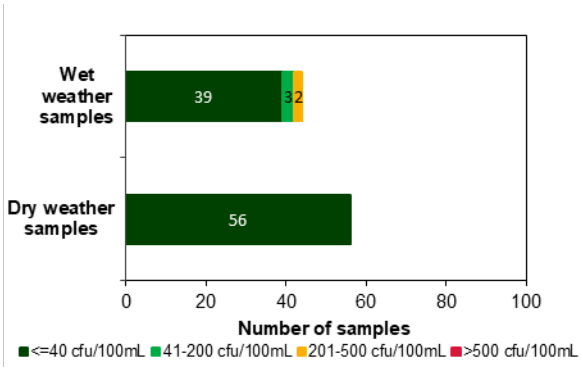
Sanitary inspection: Moderate



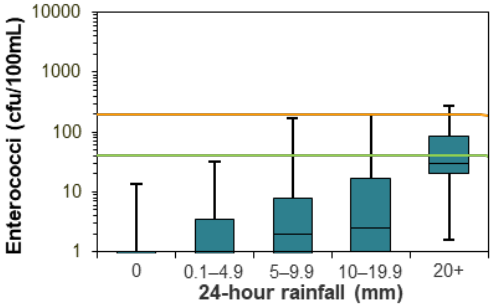
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Woonona Beach

Beach grade: VG

See 'How to read this report' for key to map.

Woonona Beach is at the northern end of a 2 km stretch of beach. Lifeguards patrol the beach from September to April.

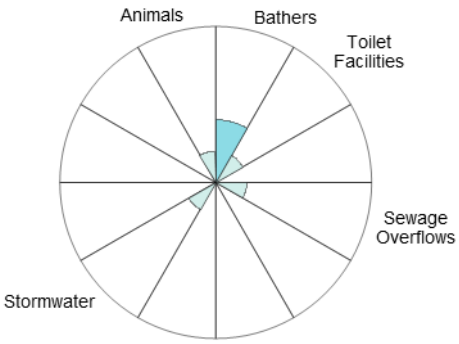
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit in response to 20 mm or more of rain.

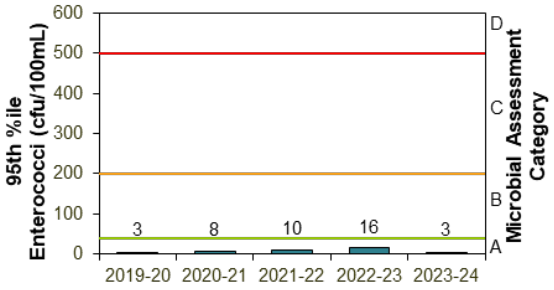
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	100%	100	Stable

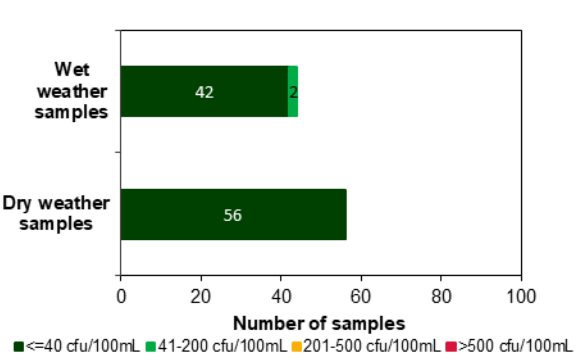
Sanitary inspection: Low



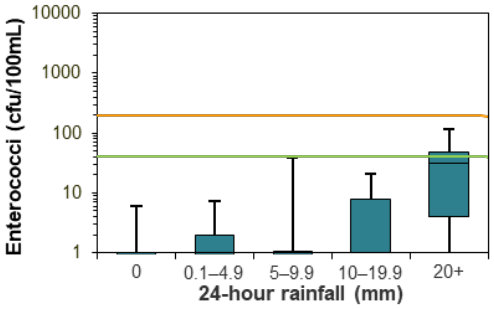
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Bellambi Beach

Beach grade: G

See 'How to read this report' for key to map.

Bellambi Beach is at the southern end of a 2 km stretch of beach. Lifeguards patrol the beach from September to April.

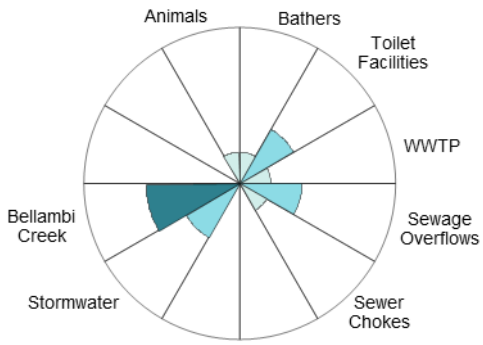
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination, including discharge from Bellambi Gully.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 5 mm or more.

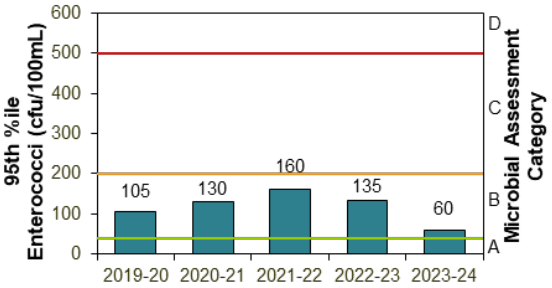
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	92%	100	Stable

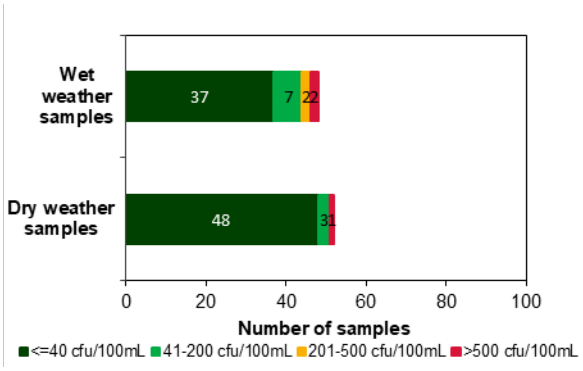
Sanitary inspection: Moderate



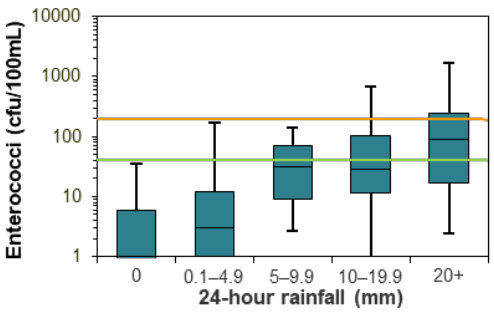
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Corrimal Beach

Beach grade: G

See 'How to read this report' for key to map.

The beach is 1.4 km long and is backed by a reserve and caravan park. Lifeguards patrol the beach from September to April.

The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination, including Towradgi Creek.

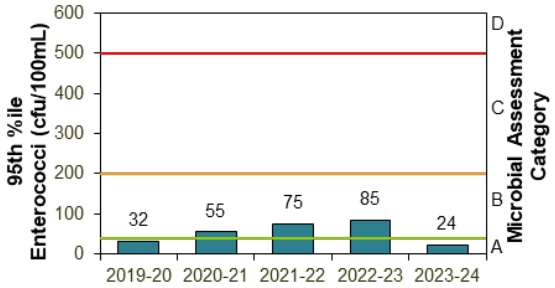
Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 5 mm or more.

The site has been monitored since 1996.

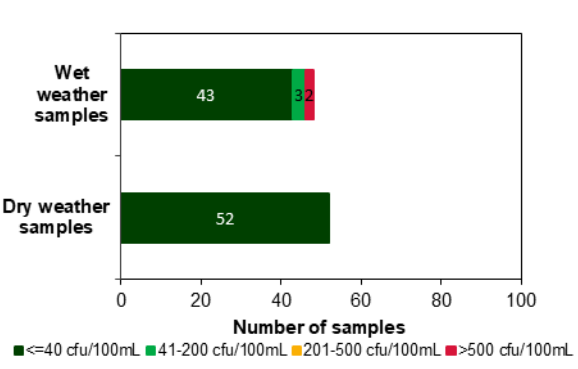
Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	100%	100	Stable

Sanitary inspection: Moderate

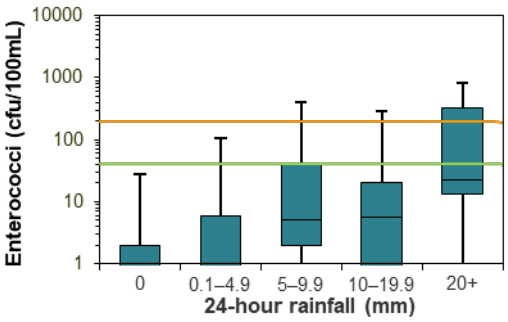
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



North Wollongong Beach

Beach grade: G

See 'How to read this report' for key to map.

North Wollongong Beach is 500 m long and is backed by steep bluffs, a reserve and a picnic area. Lifeguards patrol the beach all year round.

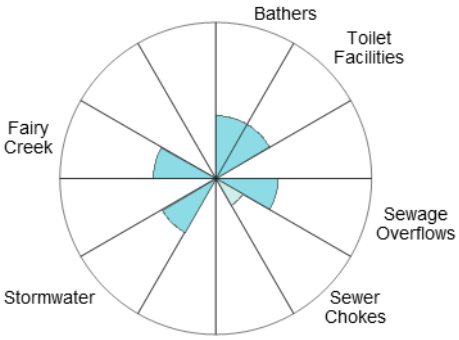
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after heavy rain, with several potential sources of faecal contamination.

Enterococci levels generally increased with increasing rainfall, often exceeding the safe swimming limit after 20 mm or more of rain.

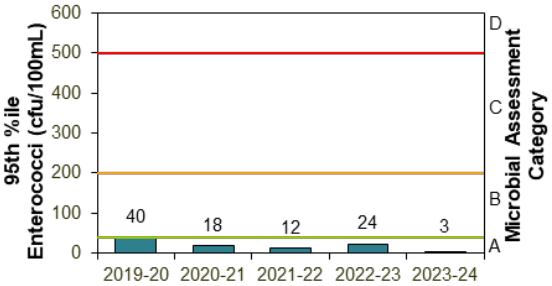
The site has been monitored since 1996, excluding 1997–1998.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	98%	100	Stable

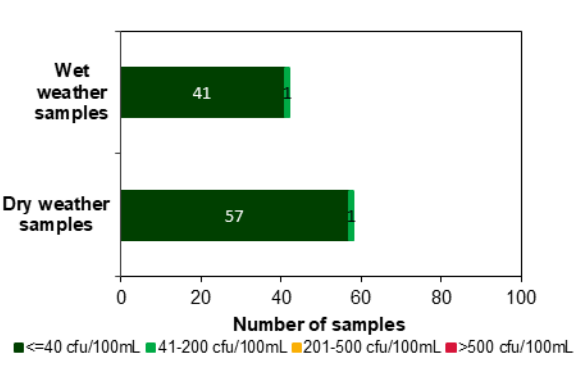
Sanitary inspection: Moderate



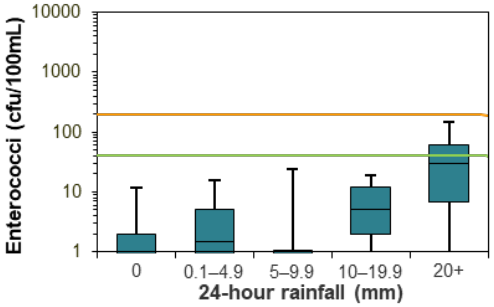
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Wollongong City Beach

Beach grade: VG

See 'How to read this report' for key to map.

Wollongong City Beach is at the northern end of a 4 km stretch of beach. Lifeguards patrol the beach from September to April.

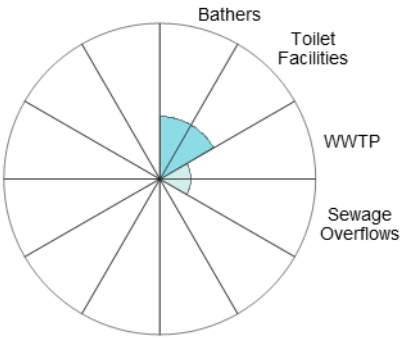
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after 20 mm or more of rain.

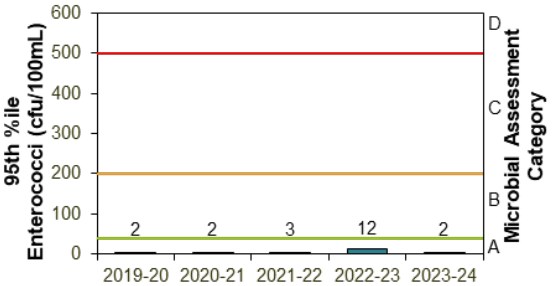
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	100%	100	Stable

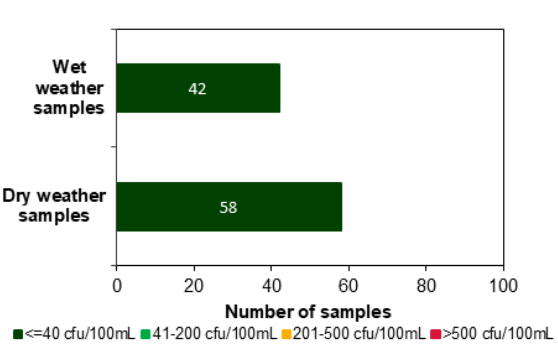
Sanitary inspection: Low



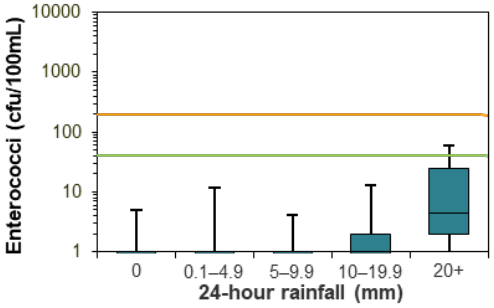
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Coniston Beach

Beach grade: VG

See 'How to read this report' for key to map.

Coniston Beach is in the middle of a 4 km stretch of sand, to the north of Port Kembla, and backed by a golf course.

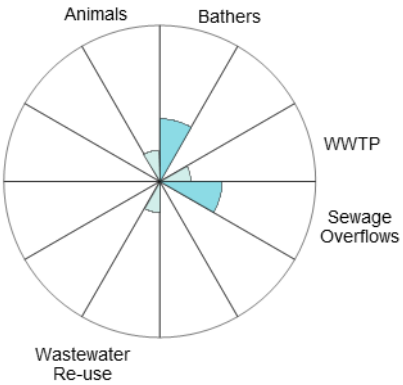
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 20 mm or more of rain.

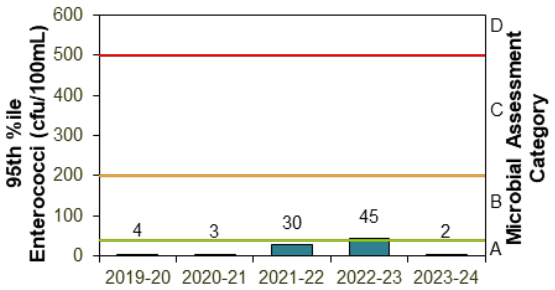
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	98%	100	Improved ↑

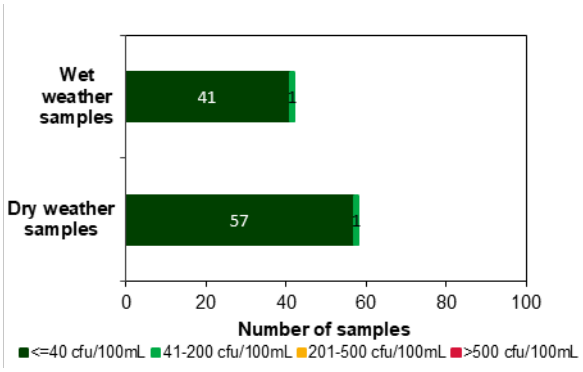
Sanitary inspection: Low



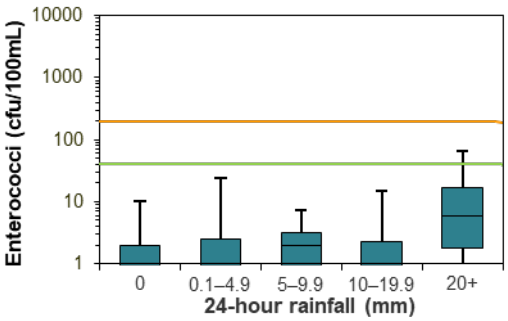
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Fishermans Beach

Beach grade: VG

See 'How to read this report' for key to map.

Fishermans Beach is a small, north-east facing beach backed by high cliffs.

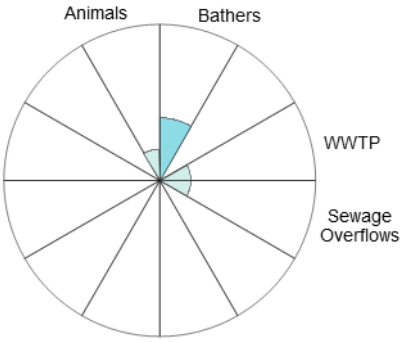
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after light rain and after 20 mm or more of rain.

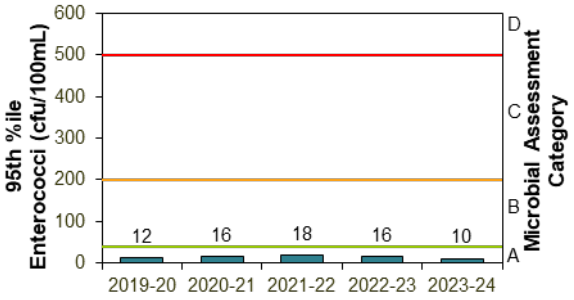
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	100%	100	Stable

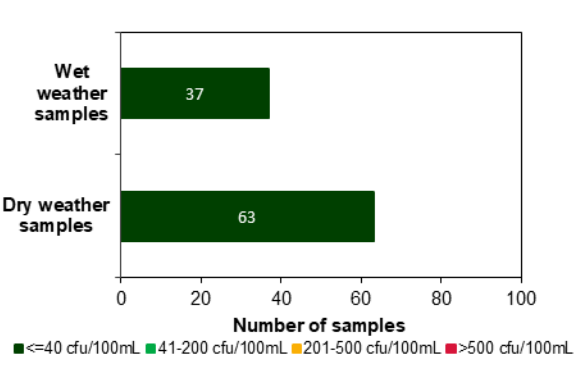
Sanitary inspection: Low



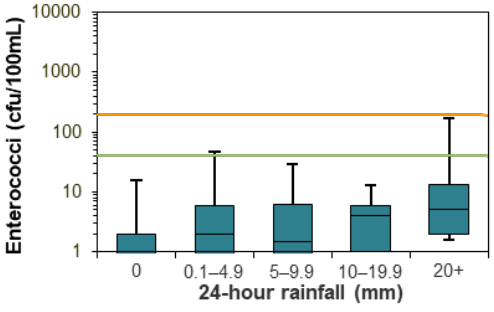
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Port Kembla Beach

Beach grade: G

See 'How to read this report' for key to map.

Port Kembla Beach is in the northern corner of a long stretch of beach. Lifeguards patrol the beach from September to April.

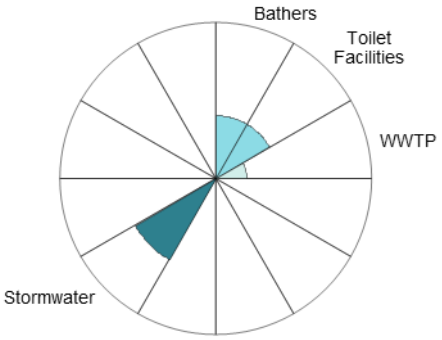
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 20 mm or more.

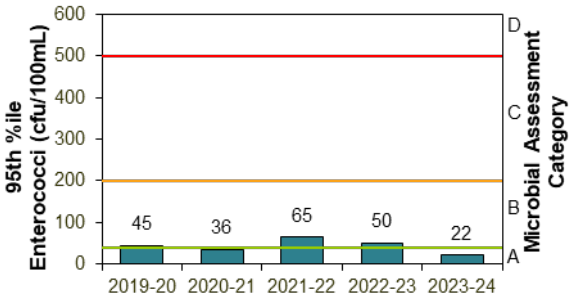
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	98%	100	Stable

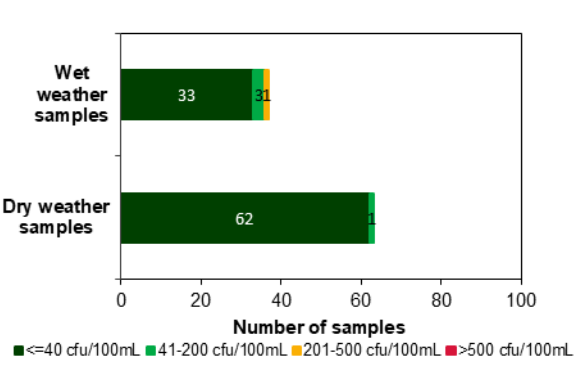
Sanitary inspection: Moderate



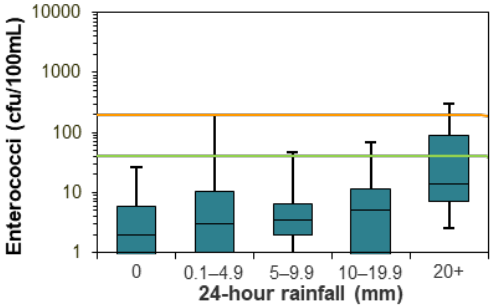
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Shellharbour City Council

100%
ocean beaches graded Good or Very Good

Overall results

Two of 3 swimming sites were graded as Very Good or Good in 2023–2024. This is a similar performance to the previous year.

Percentage of sites graded as Very Good or Good

	2021–2022	2022–2023	2023–2024	Trend
Ocean beaches (2 sites)	100%	100%	**100%**	
Lake/ lagoon sites (1 sites)	100%	0%	**0%**	

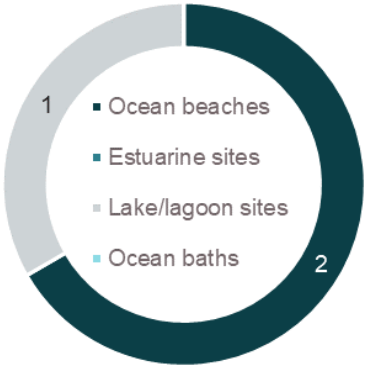
Three swimming sites were monitored in the Shellharbour local government area. All 3 locations were monitored by Sydney Water. Samples were collected every sixth day throughout the year.

See the section on **How to read this report** on page 38 for an explanation of the graphs, tables and Beach Suitability Grades.

Best beaches

Warilla Beach and Shellharbour Beach.

These sites had excellent water quality and were suitable for swimming almost all of the time.



Site types in Shellharbour City Council

Swimming sites monitored in the Shellharbour region include ocean beaches and a lake/lagoon swimming site in Lake Illawarra, with each site type having a different response to rainfall-related impacts.

In general, lake/lagoon swimming sites do not perform as well as ocean beaches, due to lower levels of flushing increasing the time needed to disperse and dilute pollution inputs, taking longer to recover from stormwater events.

As a general precaution swimming should be avoided during and for at least one day after heavy rain at ocean beaches, and for up to 3 days in lake/lagoon areas, or if there are signs of stormwater pollution such as discoloured water or floating debris.

Ocean beaches

Beach Suitability Grades for Shellharbour City Council ocean beaches

Warilla Beach and Shellharbour Beach were graded as Very Good in 2023–2024. These sites had excellent water quality and were suitable for swimming almost all of the time. Warilla Beach was upgraded to Very Good from Good due to improved microbial water quality.

It is recommended that swimming be avoided at ocean beaches during and for up to one day following rainfall, or if there are signs of pollution such as discoloured water, flowing drains or floating debris.

Lake/lagoon swimming sites

Beach Suitability Grades for Shellharbour City Council lake/lagoon swimming sites

Entrance Lagoon Beach continued to be graded as Poor in 2023–2024, consistent with the previous year. Water quality at this site was mostly suitable for swimming during dry weather conditions, with 79% of dry weather samples within the safe swimming limit when there had been no rain in the previous 24 hours. Enterococci levels increased with increasing rainfall and were often recorded after light rain.

The swimming site is located within the entrance of Lake Illawarra and has lower levels of flushing. Due to this, the site can retain pollution inputs and take longer to recover from the impacts of stormwater. Water quality at this site

may be impacted by contaminants discharged from Lake Illawarra, and stormwater during and following rainfall.

Swimming should be avoided during and for up to 3 days following rainfall, or if there are signs of pollution such as discoloured water, flowing drains or floating debris.

Sampling sites and Beach Suitability Grades in Shellharbour City Council

Entrance Lagoon Beach

Beach grade: P

See 'How to read this report' for key to map.

Entrance Lagoon Beach is on the southern shore of the entrance to Lake Illawarra and is partly enclosed by a rock breakwater.

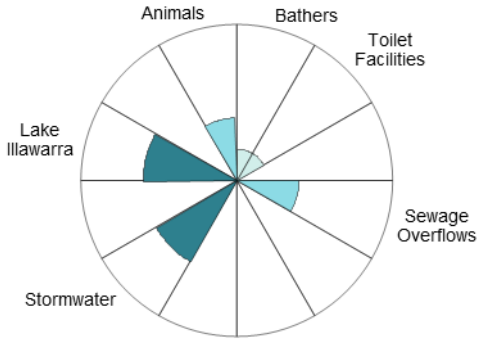
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with several potential sources of faecal contamination including stormwater and upstream sources in Lake Illawarra.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after no rain and often after rain.

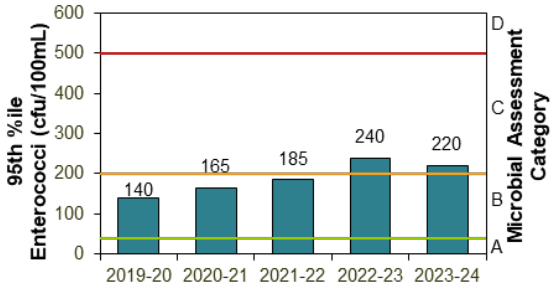
The site has been monitored since 2007.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Lake/Lagoon	Aug 2022 to Apr 2024	79%	100	Stable

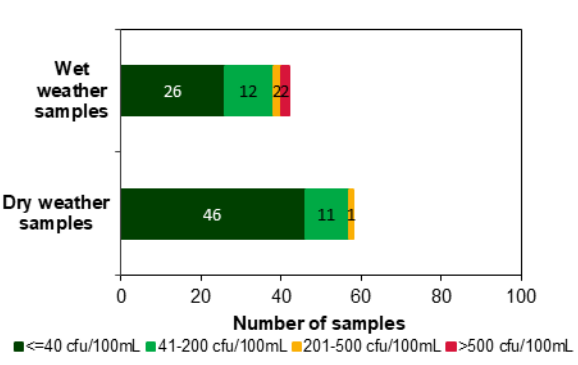
Sanitary inspection: Moderate



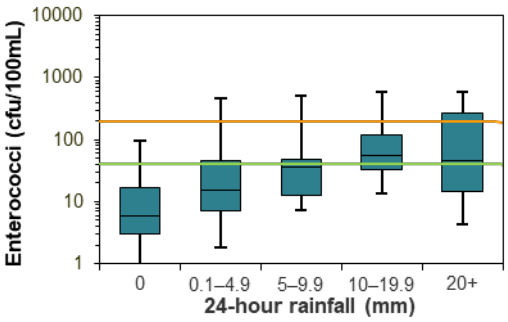
Microbial Assessment Category: C



Dry and wet weather water quality



Water quality in response to rainfall



Warilla Beach

Beach grade: VG

See 'How to read this report' for key to map.

Warilla Beach is almost 2 km long, protected by prominent headlands. Lifeguards patrol the beach from September to April.

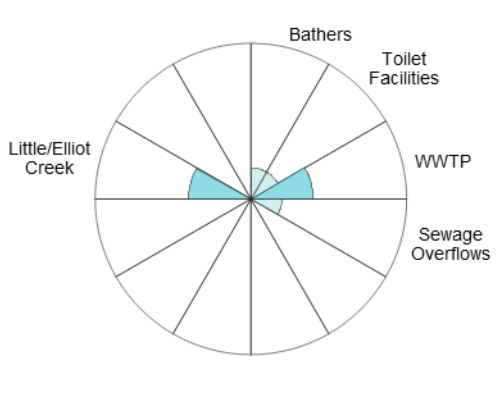
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain and often after 20 mm or more.

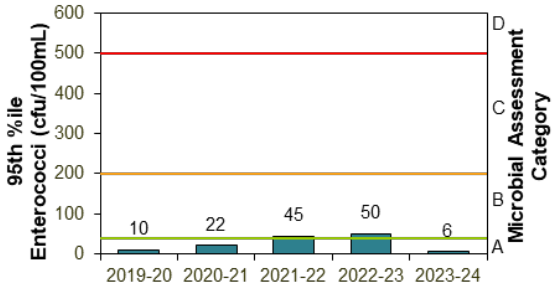
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	100%	100	Improved ↑

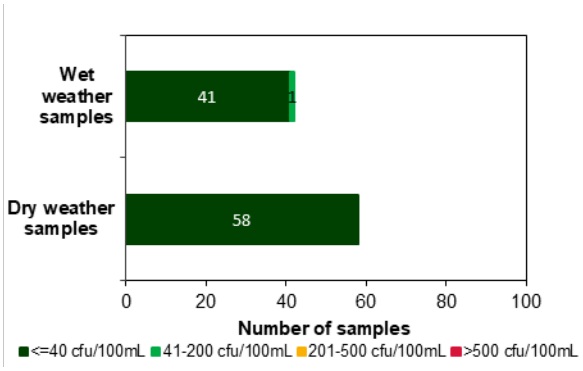
Sanitary inspection: Low



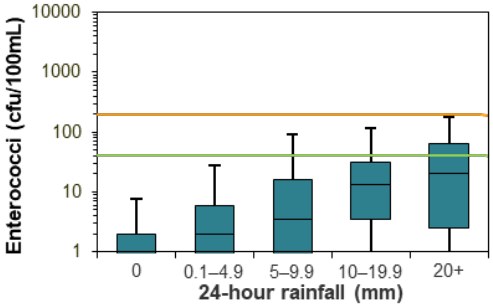
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Shellharbour Beach

Beach grade: VG

See 'How to read this report' for key to map.

Shellharbour Beach is at the southern end of a small, east facing beach. Lifeguards patrol the beach from October to April.

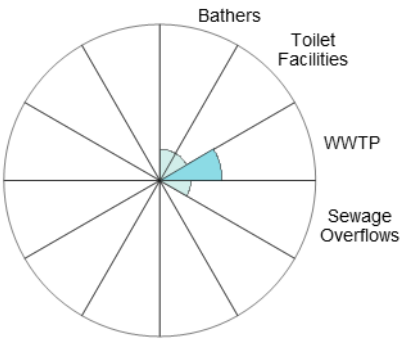
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 10 mm or more of rain.

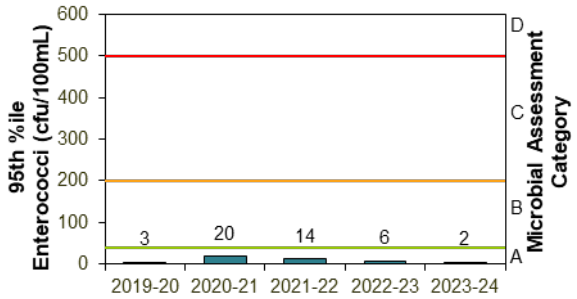
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	100%	100	Stable

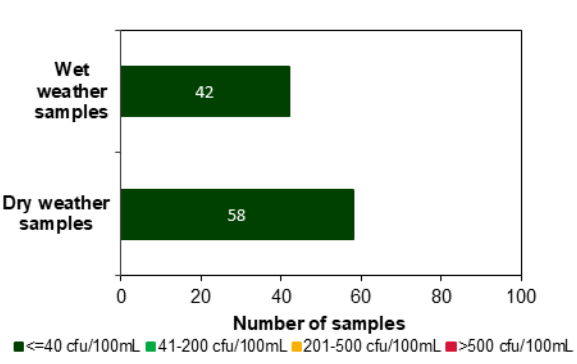
Sanitary inspection: Low



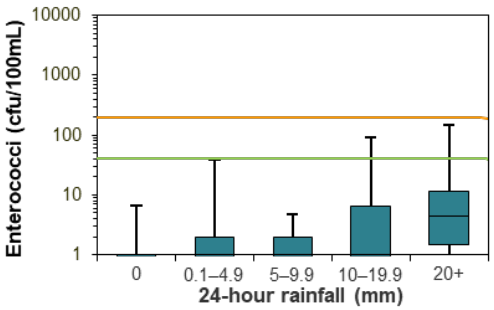
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Kiama Municipal Council

100%
ocean beaches graded Good or Very Good

Overall results

All 5 swimming sites were graded as Very Good or Good in 2023–2024. This is an excellent result and consistent with previous years.

Percentage of sites graded as Very Good or Good

	2021–2022	2022–2023	2023–2024	Trend
Ocean beaches (5 sites)	100%	100%	**100%**	—

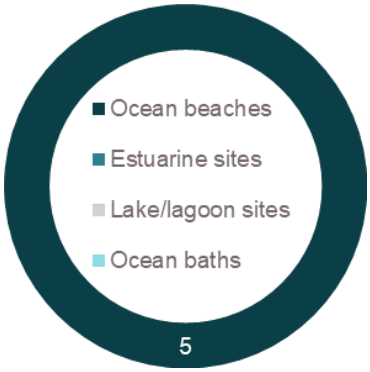
Five swimming sites were monitored in the Kiama local government area.
Four locations were monitored by Sydney Water with samples collected every sixth day. Three of these locations were monitored throughout the year. One location was monitored between October and April.
One location was monitored by Kiama Municipal Council. Samples were collected weekly between October and April and sampling and laboratory analysis was fully funded by the council.

See the section on **How to read this report** on page 38 for an explanation of the graphs, tables and Beach Suitability Grades.

Best beaches

Boyds Jones Beach, Bombo Beach and Werri Beach.

These sites had excellent water quality and were suitable for swimming almost all of the time.



Site types in Kiama Municipal Council

Ocean beaches were the only site type monitored in the Kiama region.

As a general precaution swimming should be avoided during and for at least one day after heavy rain at ocean beaches, or if there are signs of stormwater pollution such as discoloured water or floating debris.

Ocean beaches

Beach Suitability Grades for Kiama Municipal Council ocean beaches

All 5 ocean beaches were graded as Very Good or Good in 2023–2024.

Boyds Jones Beach, Bombo Beach and Werri Beach were graded as Very Good. These sites had excellent water quality and were suitable for swimming almost all of the time. All beaches were upgraded to Very Good from Good due to improved microbial water quality.

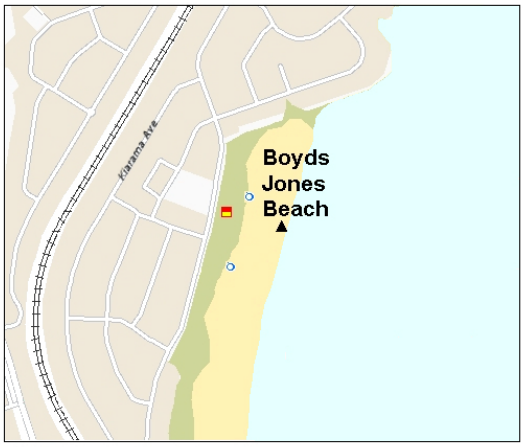
Surf Beach Kiama and Seven Mile Beach continued to be graded as Good in 2023–2024. While these beaches were frequently suitable for swimming during dry weather conditions, elevated enterococci levels were occasionally recorded following light rain, and more often after moderate to heavy rainfall.

It is recommended to avoid swimming during and for at least one day following rainfall or if there are signs of stormwater pollution such as discoloured water and floating debris.

Sampling sites and Beach Suitability Grades in Kiama Municipal Council

Boyds Jones Beach

Beach grade: VG



See ‘How to read this report’ for key to map.

Boyds Jones Beach is 1 km long, east facing and backed by dunes. Lifeguards patrol the beach from October to April.

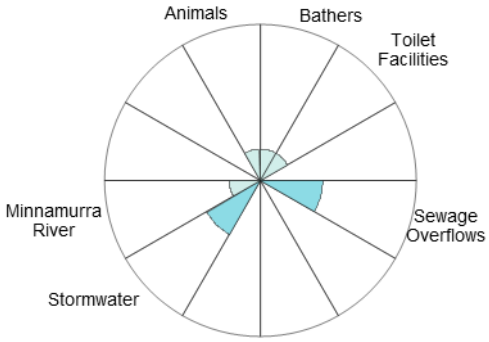
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain, and often after 10 mm or more.

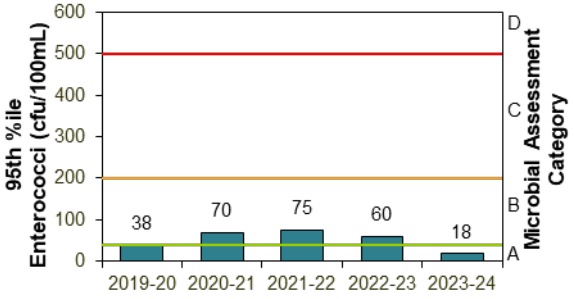
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	100%	100	Improved ↑

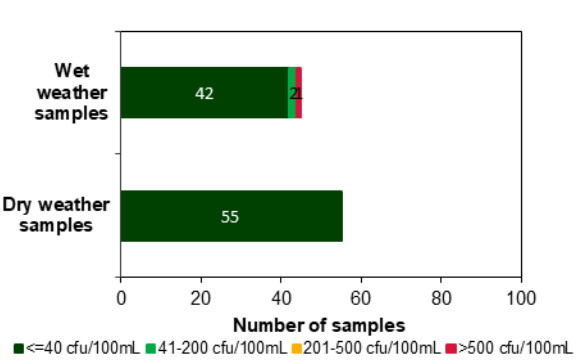
Sanitary inspection: Low



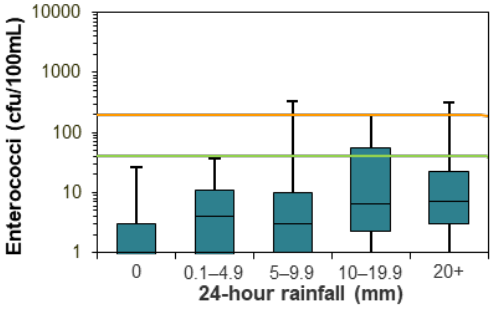
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Bombo Beach

Beach grade: VG

See 'How to read this report' for key to map.

Bombo Beach is backed by a narrow reserve, railway and freeway. Lifeguards patrol the beach over the summer school holidays.

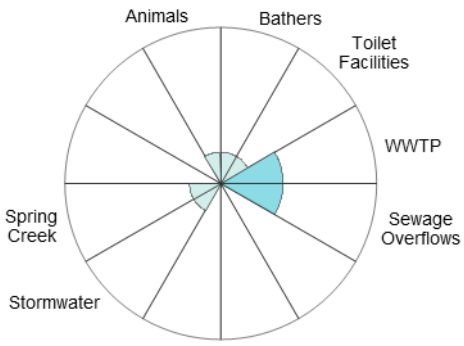
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 5 mm or more of rain.

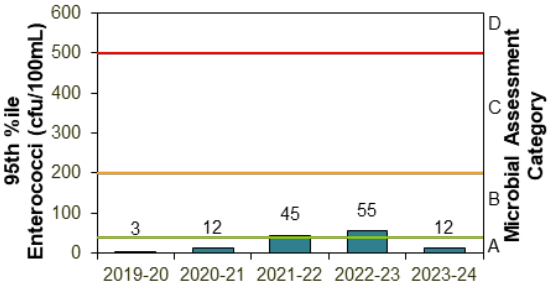
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	100%	100	Improved ↑

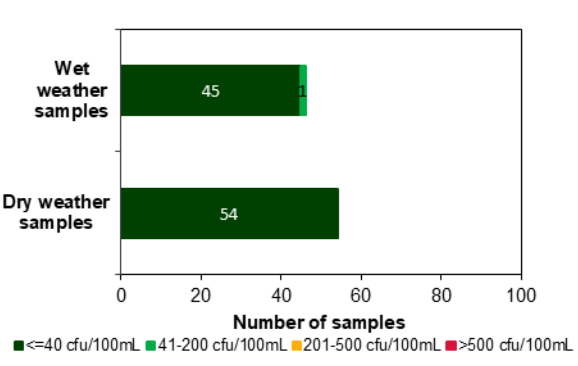
Sanitary inspection: Low



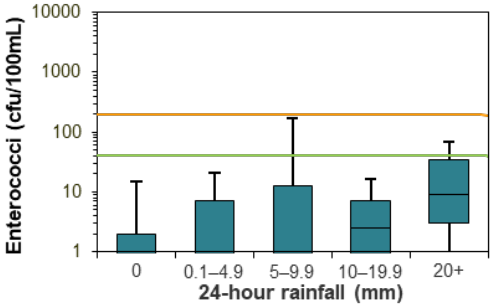
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Surf Beach Kiama

Beach grade: G

See 'How to read this report' for key to map.

Surf Beach in Kiama is 250 m long and backed by a park and surf club. Lifeguards patrol the beach from September to April.

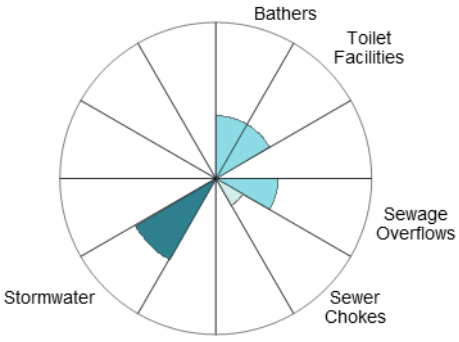
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including stormwater.

Enterococci levels increased with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 5 mm or more.

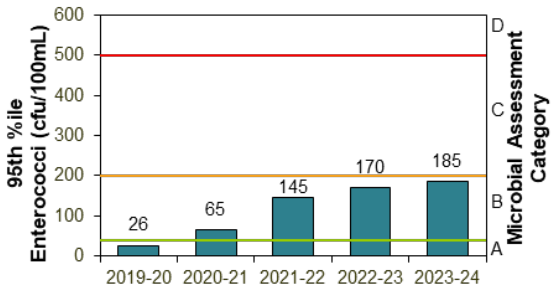
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Oct 2021 to Apr 2024	91%	100	Stable

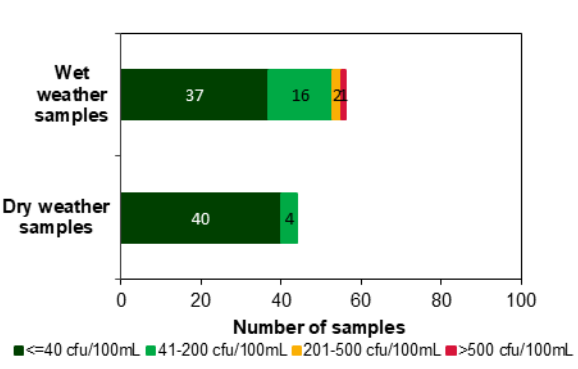
Sanitary inspection: Moderate



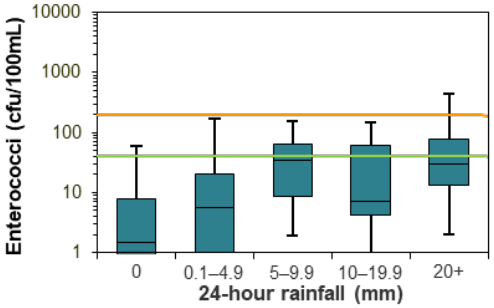
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Werri Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Werri Beach is 1.7 km long with an ocean pool on the southern rock platform. It is patrolled over the summer school holidays.

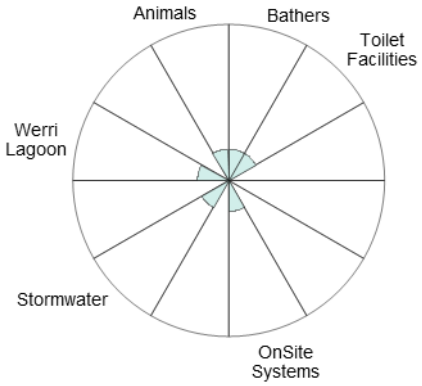
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and often after 20 mm or more.

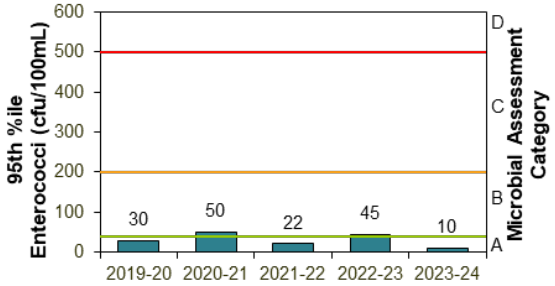
The site has been monitored since 1996.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Aug 2022 to Apr 2024	100%	100	Improved ↑

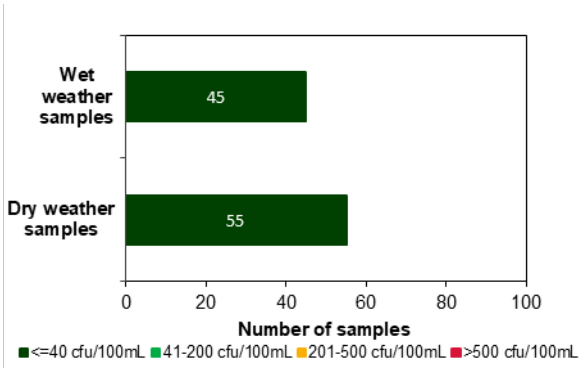
Sanitary inspection: Low



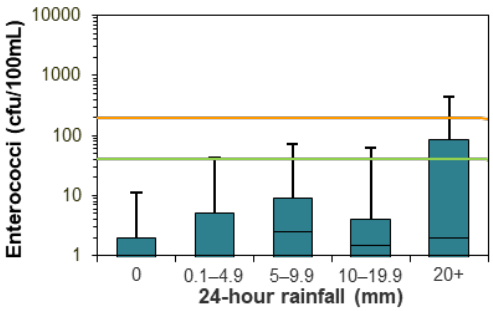
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Seven Mile Beach (Gerroa)

Beach grade: G

See 'How to read this report' for key to map.

Seven Mile Beach at Gerroa is at the northern end of a long open beach. Lifeguards patrol during the summer school holidays.

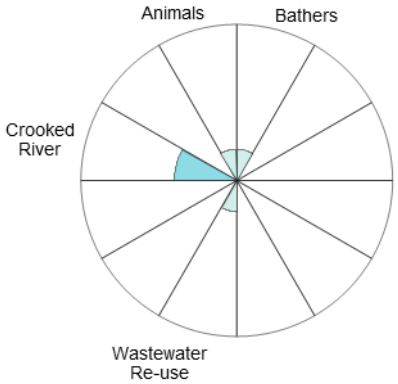
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after light rain, and regularly after 20 mm or more.

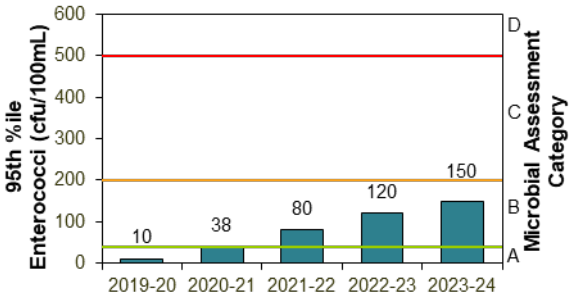
The site has been monitored since 2011.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2020 to Feb 2024	98%	100	Stable

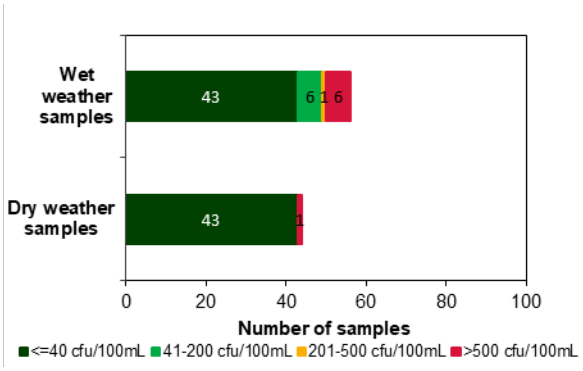
Sanitary inspection: Low



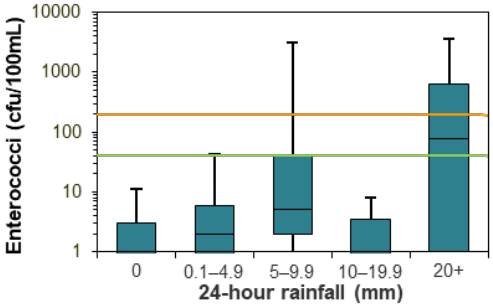
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



How to read this report

Beach Suitability Grades

Beach Suitability Grades provide an assessment of the suitability of a swimming location for recreation over time and are based on a combination of sanitary inspection (identification and rating of potential pollution sources at a beach) and microbial assessment (water quality measurements gathered over previous years). There are 5 grades ranging from Very Good to Very Poor:

VG Very Good

Location has generally excellent microbial water quality and very few potential sources of faecal pollution. Water is considered suitable for swimming almost all of the time

G Good

Location has generally good microbial water quality and water is considered suitable for swimming most of the time. Swimming should be avoided during and for up to one day following heavy rain at ocean beaches and up to 3 days at estuarine sites

F Fair

Microbial water quality is generally suitable for swimming, but because of the presence of significant sources of faecal contamination, extra care should be taken to avoid swimming during and for up to 3 days following rainfall or if there are signs of pollution such as discoloured water or odour or debris in the water

Some Beach Suitability Grades in this report are **provisional**, as the information required for the analysis is incomplete due to limited bacterial data or limited information on potential pollution sources in the catchment.

P Poor

Location is susceptible to faecal pollution and microbial water quality is not always suitable for swimming. During dry weather conditions, ensure that the swimming location is free of signs of pollution, such as discoloured water, odour or debris in the water, and avoid swimming at all times during and for up to 3 days following rainfall

VP Very Poor

Location is very susceptible to faecal pollution and microbial water quality may often be unsuitable for swimming. It is generally recommended to avoid swimming at these sites almost all of the time.

Follow Up

Sometimes a location's sanitary inspection and water quality data produce incongruent results. These locations are classified as 'Follow Up'. Further assessment will be required to obtain the necessary data to provide a definite classification in accordance with national guidelines.

The guidelines

The National Health and Medical Research Council's guidelines for managing risks in recreational water (NHMRC 2008) were adopted for use in New South Wales in May 2009. These guidelines have been adopted in all Australian states and territories and are supported by guidance notes developed by the Department of Health Western Australia (WA Department of Health 2007).

Enterococci

The national guidelines advocate the use of enterococci as the single preferred faecal indicator in recreational waters.

These bacteria are excreted in faeces and are rarely present in unpolluted waters. Enterococci have shown a clear dose–response relationship to disease outcomes in

marine waters in the northern hemisphere. In accordance with the guidelines, Beachwatch tests for enterococci only. The enterococci density in water samples is analysed in the laboratory using method AS/NZS 4276.9:2007 (Standards Australia 2007).

Enterococci are measured in colony forming units per 100 mL of sample (cfu/100 mL).

Beach Suitability Grades are determined by using the following matrix:

		Microbial Assessment Category			
		A	**B**	**C**	**D**
Sanitary Inspection Category	**Very Low**	Very Good	Very Good	Follow Up	Follow Up
	Low	Very Good	Good	Follow Up	Follow Up
	Moderate	Good	Good	Poor	Poor
	High	Good	Fair	Poor	Very Poor
	Very High	Follow Up	Fair	Poor	Very Poor

* Follow up occurs when sanitary inspection and water quality data produce potentially incongruent results; further assessment will be required.

Using the Beach Suitability Grade classification matrix, sites assigned a moderate Sanitary Inspection Category can only be rated as Good or Poor, with no option of Fair grades. This can create the impression of a large change in water quality when in fact there need only be a slight increase in bacterial counts to push it over the threshold, with no significant increase in the risk to public health.

Microbial Assessment Category (MAC)

There are 4 Microbial Assessment Categories (A to D) and these are determined from the 95th percentile of an enterococci dataset of at least 100 data points. Each MAC is associated with a risk of illness determined from epidemiological studies. The risks of illness shown below are not those associated with a single data point but are the overall risk of illness associated with an enterococci dataset with that 95th percentile (Wyer et al. 1999).

Risk of illness associated with Microbial Assessment Categories

Category	Enterococci (cfu/100 mL)	Illness risk*
A	≤40	GI illness risk: <1% AFR illness risk: <0.3%
B	41–200	GI illness risk: 1–5% AFR illness risk: 0.3–1.9%
C	201–500	GI illness risk: >5–10% AFR illness risk: >1.9–3.9%
D	>500	GI illness risk: >10% AFR illness risk: >3.9%

* GI = gastrointestinal illness; AFR = acute fever and rash

Calculating the MAC

The 95th percentile is a useful statistic for summarising the distribution of enterococci data at a site. It embodies elements of both the location of the distribution (how high/low the enterococci counts are) and the scale of the distribution (how variable the enterococci counts are).

The 95th percentile values for each of the 4 Microbial Assessment Categories were determined by the World Health Organization using enterococci data collected from swimming locations across Europe. These values will represent different probabilities of illness if the distribution of enterococci data from swimming locations in New South Wales differs from the European distribution.

In recognition of this issue, Dr Richard Lugg (Department of Health, Western Australia) has developed a Microsoft® Excel tool for calculating a modified 95th percentile that takes into account the distribution of data. The WA Department of Health recommends a minimum of 65 samples, collected from a particular site over 5 consecutive years, to provide sufficient confidence and reliability in the 95th percentile data output. This tool has been used to calculate the 95th percentile values

presented in this report and has been adopted for use by other state governments in Australia.

The tool can be downloaded from the WA Government's 'Environmental waters publications' webpage, under *Forms and templates*.

Sanitary Inspection Category (SIC)

More information about the **sanitary inspection** process is available in the Beachwatch Protocol for assessment and management of microbial risks in recreational waters, found on the department's website.

The aim of a sanitary inspection is to identify all sources of faecal contamination that could affect a swimming location and assess the risk to public health posed by these sources. It is an assessment of the likelihood of bacterial contamination from identified pollution sources and should, to some degree, correlate with the bacterial water quality results obtained from sampling.

The main sources of faecal contamination considered in the sanitary inspection are: bathers, toilet facilities, wastewater treatment plants (WWTPs), sewage overflows, sewer chokes, onsite systems, wastewater re-use, stormwater, river discharge, lagoons, boats and animals.

Rivers, lakes and estuaries themselves can be potential sources of faecal contamination to sites located in these waterbodies, with contaminated water from upstream or surrounding areas impacting water quality at the swimming location. This source is captured in river discharge or lagoon category, and shown as the waterbody in the sanitary inspection charts.

Through the sanitary inspection process, beaches are categorised to reflect the overall likelihood of faecal contamination. There are 5 categories: Very Low, Low, Moderate, High and Very High.

Stormwater drain flow

Photo: Beachwatch/DCCEEW

Stormwater in urban areas often contains sewage from leakages, overflows or sewer chokes when the sewerage system fails.

Sewage overflows can occur in wet weather when the network has exceeded capacity due to rainwater entering the system. The mix of sewage and rainwater discharges from designated overflow points and drains to waterways, usually via the stormwater system. Overflows from the sewerage system can also occur in dry weather due to mechanical failure or power outage.

Sewer chokes occur due to blockages in the pipes usually due to tree roots, oil, grease or debris. This causes sewage to back up and escape via sewer inspection points, designed overflow structures or cracks in the pipes, then drain to waterways, usually via the stormwater system.

Explanation of tables

Each region contains tables listing all monitored swimming sites including site type, beach grade and change in grade from the previous year.

The following symbols are used to show the change in beach grade from the previous year:

○ Stable

▲ Improved

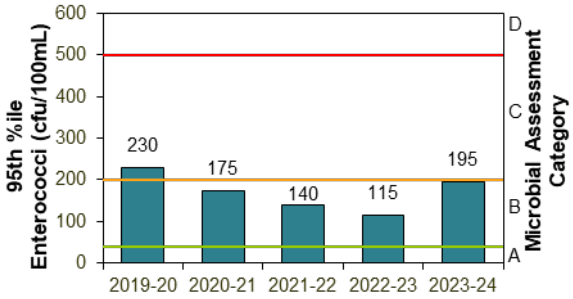
▼ Declined

A provisional grade indicates the assessment is based on limited data collected during the assessment period and should not be compared to the beach grade from the previous year.

Explanation of graphs, charts, and information bars on beach pages

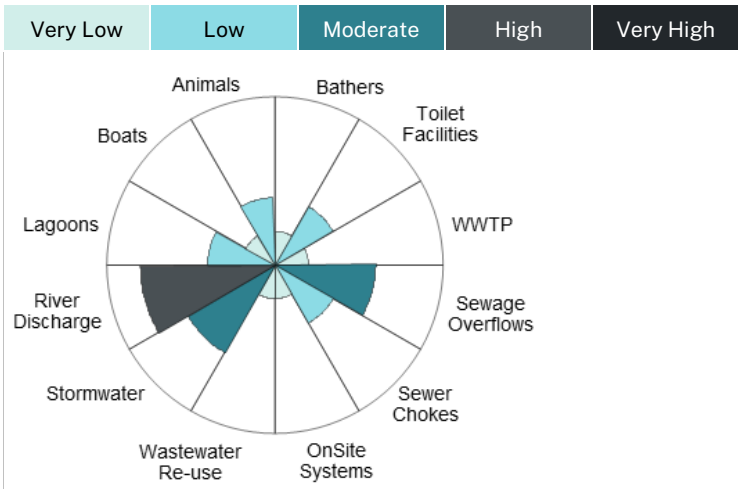
Microbial Assessment Category (MAC) chart

On each beach page, the MACs for the last 5 years are displayed on a simple bar chart. The MAC for the current year is based on enterococci data collected during the assessment period. The bars are labelled with the 95th percentile value for each year and the thresholds dividing the A, B, C and D categories are marked in green, amber and red for reference.



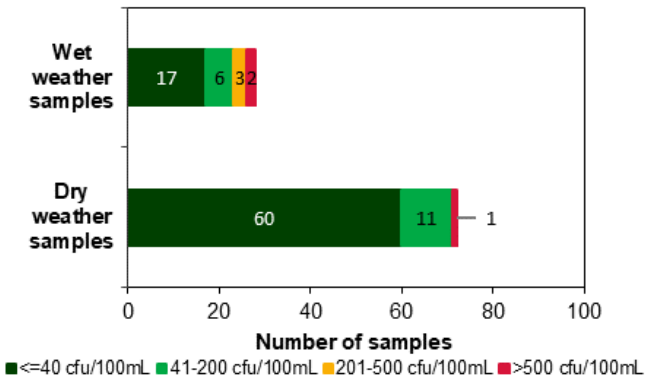
Sanitary Inspection Category (SIC) chart

The results of the sanitary inspection for each swimming location are presented in a radar pie chart. The chart shows the likelihood that each identified pollution source will contribute to faecal contamination at a swimming site, as indicated by the size and colour of the segment, ranging from very low (lightest colour) to very high (darkest colour) as shown below. The sum of these contributions is the overall likelihood, or Sanitary Inspection Category.



Wet and dry weather water quality chart

Enterococci levels in wet and dry weather conditions are presented for each swimming location as a bar graph. All data collected during the assessment period is included in the analysis. Dry weather is defined as no rainfall recorded in the previous 24 hours. Each bar is colour coded to show the number of enterococci results up to 40 cfu/100 mL, between 41 and 200 cfu/100 mL, between 201 and 500 cfu/100 mL and greater than 500 cfu/100 mL. These categories reflect the Microbial Assessment Category thresholds and are coloured on the graph as dark green, light green, amber and red respectively.

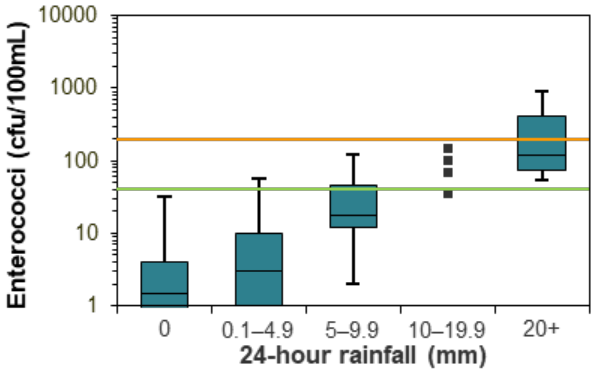


It is expected that swimming sites with lower levels of flushing will show some elevated bacterial results in dry weather samples (no rainfall in the previous 24 hours) due to the longer time needed to recover from a rainfall event. At some estuarine and lake/lagoon swimming locations the impacts of stormwater pollution on beach water quality may be detected up to 3 days after rainfall.

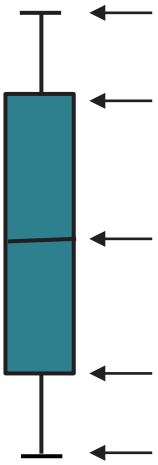
Water quality in response to rainfall

Trends in enterococci levels in response to rainfall are shown using a box plot. For reference, enterococci levels of 40 cfu/100 mL and 200 cfu/100 mL are indicated with a green and orange line, respectively. The 40 cfu/100 mL level is referred to as the ‘safe swimming limit’. The enterococci data were obtained from the last 5 years of monitoring. Rainfall data were obtained from rain gauges situated close to the sample site and are 24-hour totals to 9 am on the day of sampling. If there are fewer than 5 enterococci data points in a rainfall category, individual data points are presented instead of a box plot. At sites

where many results are below the detection limit (1 cfu/100 mL), only the upper portion of the box plots will be visible.



Each part of the box plot represents a significant percentile value of the sample population:



95% of the samples lie below the top whisker

75% of the samples lie below the top of the box

half the samples are on each side of the middle line of the box (median or 50%ile)

25% of the samples lie below the bottom of the box

5% of the samples lie below the bottom whisker.

Information bars

Information bars on each beach page provide a summary of details about the swimming site.

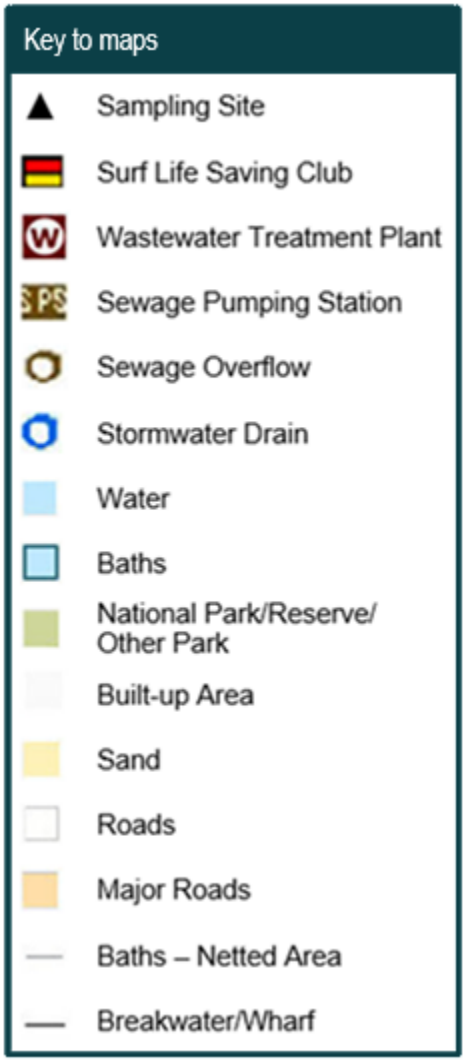
The **assessment period** shows the timeframe in which the water samples were collected. The NHMRC guidelines state beach grades should be determined from the most recent 100 water quality results collected within a 5-year period. The assessment period varies between sites depending on sampling frequency.

Dry weather samples suitable for swimming (**dry weather swimmability**) shows the percentage of water samples with enterococci levels below 40 cfu/100 mL. Dry weather is defined as no rainfall in the previous 24 hours.

Swimming sites with lower levels of flushing often have a lower percentage of dry weather samples within the safe swimming limit due to the impacts of rainfall detected up to 3 days after the event.

Explanation of maps

A map of individual swimming locations is presented on each beach page. The scale of the maps is 1:10,000. Each map shows the location of the sampling site, land use and features such as surf lifesaving clubs. Potential pollution sources such as stormwater drains, sewage pumping stations, wastewater treatment plants, lagoons, rivers and creeks, are shown where accurate data is held.



References

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More information

- Beachwatch NSW on X (formerly Twitter)
- Beachwatch NSW on Facebook
- Beachwatch webpage
- Coastal management program progress
- Sanitary inspection of beaches
- Subscribe to daily pollution forecast emails
- WA Government environmental water publications
- Wollongong City Council Coast and Waterways
- Shellharbour City Council Coastal zone management
- Kiama Municipal Council Coastal Management Program