

Terrigal and coastal lagoons audit and water quality improvement program

COUNCIL NAME

Central Coast
Council

WEB ADDRESS

[centralcoast.nsw.gov
.au](http://centralcoast.nsw.gov.au)

SIZE

1,680 km²

POPULATION

343,968

Overview

The Terrigal and coastal lagoons audit project is an innovative partnership between Central Coast Council and the NSW Government. It aims to address the lack of formal processes available to councils to improve recreational water quality in coastal environments. The audit developed methods to research, investigate and improve recreational water quality in receiving waters containing microbial pollution. From January 2019, the audit successfully identified pollution hotspots, inspected 52.9 km of sewerage pipes and identified and remediated 14.2km of sewer.

Background

The Central Coast is known for its natural coastal beauty. Maintaining natural assets is a critical service that the Central Coast Council provides to the community. However, land use changes, population growth and human activities are placing increasing pressures on the health of its coastline and waters.

Recreational water quality and waterway health is monitored by Council using Enterococci bacteria as the key indicator for health-based swim-safety. These results inform the NSW Government Beachwatch Partnership Program, and the annual Beach Suitability Grades.

Results of this monitoring indicated that Terrigal Beach and four Coastal Lagoons regularly experience poor recreational water quality. However, they do not provide management information on how to address the source of pollutants or assess the extent of microbial contamination. In addition, there are no water quality improvement guidelines or processes available to assist councils with improving recreational water quality.

The Audit project was designed to respond to this gap with the aim of developing an investigation process that can improve recreational water quality to support community and environmental values on the Central Coast and also be used by other councils in similar circumstances. In a partnership between Council and the Department of Planning Industry and Environment (DPIE), the Project Control Group included environmental scientists from Council and DPIE; microbial research scientists from the University of Technology Sydney; stormwater and sewer engineers, maintenance staff, compliance officers, administrative and managerial support staff. The project is jointly funded by Council and the NSW Government, and seeks to continuously monitor and improve catchment infrastructure and waterway health conditions

Objectives

The Audit has 3 project phases, each with specific objectives and responsibilities for Council and DPIE as follows:

Phase 1 – Initial investigations to develop an understanding of the water quality at each site - assessing the biological source and its interaction with ocean or lagoon conditions.

Phase 2 – Major investigations to inspect the catchment in detail and track down microbial contamination sources.

Phase 3 – Once likely pollution sources are determined, undertake i) infrastructure works to improve water quality and (ii) post-works monitoring to assess water quality improvements.



Implementation

The project was initiated in January 2019 under the guidance of the diverse, highly skilled and experienced Project Control Group (PCG). The planning phase focused on developing sufficient processes and details to coordinate the multidisciplinary, multiphase project. The research and investigation process also had a clear monitoring phase established prior to remediation works being undertaken. The monitoring approach ensured water quality data is available to benchmark against post-work monitoring program and to assess if water quality has improved over time.

Project implementation included: Water sampling at the beach, lagoon and in stormwater pipe outlets and within the catchment; CCTV camera inspections looking for cracks and displacements in pipes, dye testing and smoke testing for illegal connections, a sewer manhole reveal and seal program to assess for overflows and, where defects are found, appropriate remediation, including: relining pipes; resealing and raising manholes; digging and replacing broken pipes and rectifying illegal connections.

Outcomes

Microbial indicators and microbial markers found that human sewage is a major source of contamination. Ocean sampling and hydrodynamic modelling of Terrigal Beach successfully assessed the movements of microbial contamination and risks to swim safety. Systematically sampling stormwater through the catchment identified and mapped pollution hotspots and helped to direct priority sewer network investigations and upgrades.

To date, 52.9 km of sewer pipe network CCTV investigations have been completed; 1,697 manholes have been assessed and inspected, and 343 private properties have been assessed. Inspections to date have identified: 14.3 km of pipes as having defects in need of repair; 5 manholes that need resealing; 10 properties with illegal stormwater to sewer connection; and one property with sewer connected directly to stormwater.

Of the 14.3 km identified pipe system defects, 12.4 km has been repaired and the remaining 1.9 km is scheduled for repair. Of the 11 illegal connections, 7 have been rectified and 4 scheduled for repair. Investigations will continue to detect potential pollution pathways as the program continues.

As investigations are still underway the Audit is not yet able to evaluate the overall success of the project. A long-term project plan has been developed, and continued water sampling provides a long-term measurable benchmark to assess water quality improvements over time.

Key Learnings

The use with UTS of new research techniques to assess microbial contamination has provided Council with the ability to test microbial contamination to improve recreational swim safety at other sites, and also future opportunities to expand assays to investigate pollution sources from other animals which likely affect farming and natural areas catchments. Supporting the development of these new methods with UTS will improve cost-efficiencies and access to other councils too.

The new methods can also be applied to determine and map pollution hotspots across the whole central coast. By targeting pollution hotspots with ongoing programs of sewer network inspections and repairs, Council can prioritise future expenditure across the LGA based on community health risks.

Audit results confirm that typically undetected sewer network defects contribute to poor water quality. Ageing infrastructure and illegal connections and blockages are all likely contributors. This information has important implications for other areas on the Central Coast and across NSW more broadly.

The Audit is a large and complex auditing process, which required effective partnerships between Council and DPIE, as well as technical and operational staff who have not previously worked together.

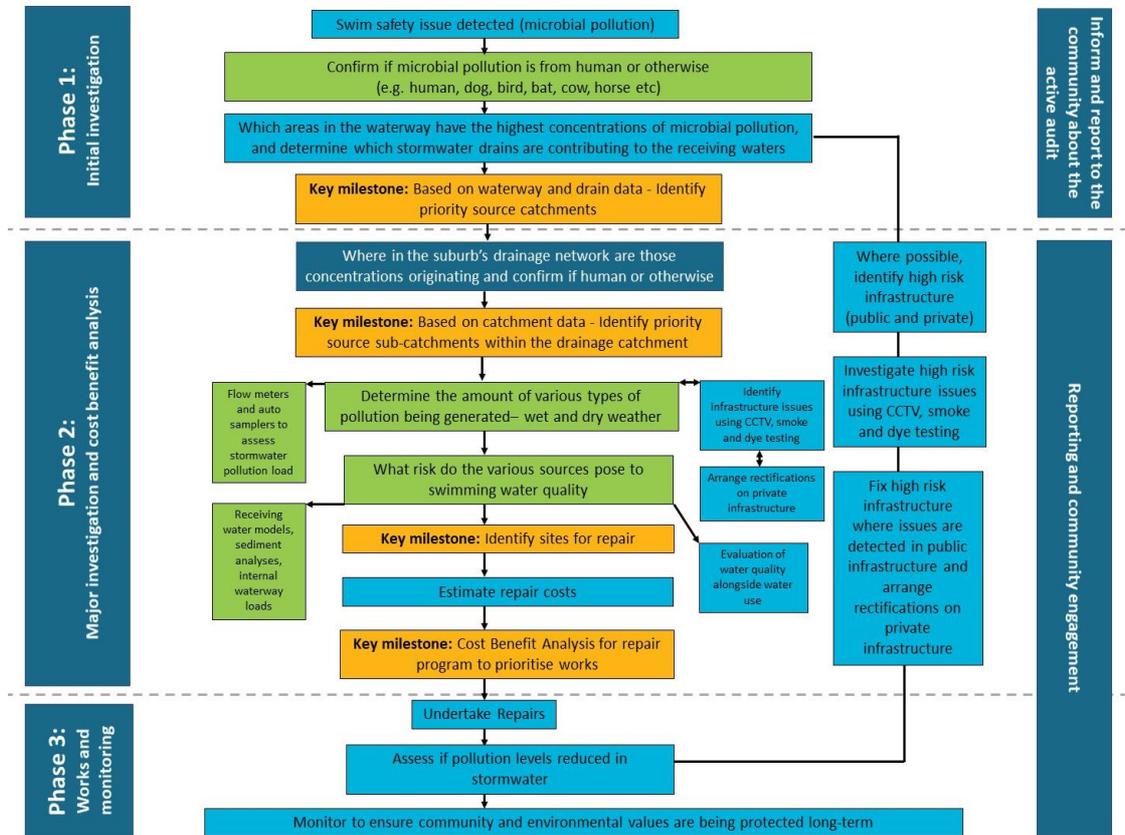
Learnings from this innovative project will undoubtedly benefit other councils, coastal communities and the NSW Marine Estate.

Water Quality Audit Structure Summary



Colour key

Council primary responsibility	State Government primary responsibility
Joint responsibility	Key audit milestone



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This project was the 2020 winner of the Environmental Health Management Award at the LGNSW Excellence in the Environment Awards